CATASTROPHES AND EARTH HISTORY: The New Uniformitarianism. W. A. Berggren and J. A. Van Couvering (Editors), Princeton University Press, Princeton, New Jersey 08540 (1984), pp. 464. Price: Cloth $ 84/50, Paper $ 19/50.

This admirably printed and bound volume includes several thought-provoking and stimulating papers which were originally presented at a symposium held in Woods Hole Oceanographic Institute entitled 'Organisms and Continents Through Time'. A re-evaluation of the concept of uniformitarianism based on events and processes familiar to human experience is attempted in all the papers. How difficult it is to assert that everything about the past can be learned from looking at the world around us is emphasized.

The several papers included in the volume are grouped into four main parts: (1) the concept of catastrophe as a natural agent, (2) the Cretaceous-Tertiary Boundary: a case in point, (3) Catastrophic processes in the Geological Record, and (4) Catastrophes and the real world.

The group of papers in Part I question many of the ideas which we have held sacred and at the same time make the science of geology more fascinating mainly because of its unpredictability. We learn that Earth history is not uniformitarian but that it is punctuated by events that are unpredictable, like palaeomagnetic reversals for example. These events may have different effects on life, some beneficial and others destructive. Such events are rare and defy rigid scientific analysis.

Papers in Part II are related to a discussion of the Cretaceous-Tertiary boundary as a case in point. Mass extinction is not a normal continuing aspect of organic evolution. There is some overriding external environmental agent responsible for the wholesale destruction of organisms. Strictly uniformitarian thinking had the unfortunate effect of discrediting such unusual or concealed world events. The new plate tectonic theory, on the other hand, helped focus attention on episodes of diastrophism and revolutionary geographic and climatic changes. Extra-terrestrial catastrophic events have been envisaged to account for mass extinction at the end of Cretaceous. The problem yet remains unsolved.

Catastrophic processes in the geological record is the title of Part III and includes papers on low sea levels, droughts and mammalian extinction in the Cenozoic, geoid changes and multiple geophysical interaction. Correlation between regions, vegetational changes and extinction during the Cenozoic are emphasized. Two kinds of faunal turnover, one rapid and the other gradual, are described. The end of the Permian is marked by a profound change in the history of life. The reduction in the diversity of plants and animals and land plants near the Permian Triassic boundary is termed the Phanerozoic Crisis. Sudden reduction in world ocean salinity is invoked as one of the causes. History of Tethys sea is traced – the wide Tethys being gradually sealed off from the Indian ocean by progressive plate movement northward, reducing the Tethys into a warm deep sea. Sea level was lowered and salinity increased causing total extinction of stenohaline marine fauna. Most ocean systems are shown to begin and end as seas and with salinity crisis. The Tethys began in the Permian and ended in Miocene. The Tethyan fauna was destroyed.

The last chapter in the book is on marine mineral resources and uniformitarianism. The author in this article traces man's use of rocks and minerals from his primitive beginnings and concern to strengthen his fists with rocks, to the present age

of advanced technology requiring a host of minerals and metals. Use of minerals is shown to have increased logarithmically causing critical shortages of many of the rare metals. It is emphasized that this critical shortage is the result of less than a century of intense mining of deposits that had accumulated over several billions of years. The author points this out as an example of the catastrophic use of a uniformitarian accumulation and natural enrichment of a resource. Excessive mining on land and ocean floor, it is pointed out, will surely lead to catastrophes in human affairs in both underdeveloped and industrially advanced countries. We are already witness to the enormous inflationary effects attendant upon the political manipulation of price of oil by OPEC. This is a human induced catastrophe.

This review it is hoped will serve to give a glimpse of the type of knowledge and creative thinking gathered together in the pages of this book. It is most stimulating reading and all geologists, whatever be their specialization, must carefully read the several articles and enlarge their vision. The paperback edition is reasonably priced and it should not be difficult to secure a copy by most of the Earth Science Libraries in the country.

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CONTEMPORARY GEOSCIENTIFIC RESEARCHES IN HIMALAYA: Editor A. K. Sinha, Publisher: Bishen Singh Mahendra Pal Singh, Dehra Dun. Vol. I (1981), pp. i-viii+250+index with 12 plates and many figures, Price: Rs. 275/-, Vol. II (1983) pp. i-iv+168+index with 8 plates and many figures, Price: Rs. 195/-.

The two volumes have been brought out in honour of Shri S. P. Nautiyal, formerly of the Geological Survey of India. Volume I deals with tectonics, regional geology and biostratigraphy and Volume II contains papers on geochemistry, petrology, sedimentology, metallogeny, photogeology and engineering geology.

Volume I contains 29 papers on tectonic aspects, eleven on regional and local geology, eight on stratigraphy and palaeontology and one each on paleomagnetism, Earthquake and Rb/Sr dating.

Valdiya and Pant discuss the evidences in support of the allochthonous nature of the Berinag belt. Schwan has concluded that B3/S3/T3 minor structures have the same attitude as major tectonic structures in the Himalaya. He relates the B1/B2 fabrics to the pre-Permian and pre-Himalayan deformations. Ruzhentsev and Shvolman conclude that the structural peculiarity in Pamir and Afghanistan is controlled by superposition of genetically different phases of deformation which can have relevance to similar set-up in the NW Himalaya. The tectonic evolution of the Sikkim Himalaya by Raina and Srivastava, surprisingly has left out all recent contributions on this sector. Their paper contains contradictory statements like existence of eugeosyncline in the northern part in one place and a categorical assertion of no volcanic rocks in Sikkim Himalaya in another. Pati and Rao have cited certain parametres to delineate the MCT in the U.P. Himalaya. Virdi presents an island arc model for the evolution of Indus ophiolite belt of Ladakh. Raiverman has made an important observation pointing out how the Surajpur Thrust in the Simla Hills has controlled the pattern of Paleogene sedimentation as a growth fault.