the historical damaging earthquakes occurred. The source zones for crustal earthquakes are very poorly known.

It is important to highlight some of the conclusions given by editors in their summary of this volume. They point out that large shallow earthquakes are likely to occur in the Pacific northwest. However, little is known about the recurrence of these events or their potential locations. Great earthquakes are possible on some segments of Cascadia thrust fault with magnitudes at least as much as 8. Unfavourable ground conditions in the Puget Sound -Willamette Valley lowland are likely to increase the earthquake hazard substantially. The shaking in principal urban areas will largely depend on the extent of downdip rupture in subduction earthquakes in the Cascadia thrust fault. In future large Benioff-zone earthquakes are likely to occur. They note that although much remains to be done for further understanding of earthquake hazard in Pacific northwest, significant progress has been made in several areas.

The work reported in this volume shows how geological record can be used to learn about the past earthquakes and make assessments of the future earthquake hazard. This is a very well written and documented volume and is a must for geologists and geophysicists involved in studying earthquake hazards.

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"EROSIONAL AND DEFORMATIONAL STRUCTURES IN SINGLE SEDIMENTARY BEDS: A GENETIC COMMENTARY" by S. Dzulynski. The paper forms a part of one - semester lecture course delivered at the Hebrew University, Jerusalem, in the year 1989. Annales Societatis Geologorum Poloniae, v.66, No.2, p.101.

While the material offered in the paper is not entirely new, but is a useful compilation of various scattered publications of the writer and his co-workers, many of which may not be available to Indian geologists. Secondly, the paper offers the present state of the art on the subject, and here lies its strength. Hence, the present updated compilation will, it is felt, help the Indian students of earth sciences immensely.

Most of the structures discussed here "are either produced on interfaces between one bed and the bed immediately below or above, and on interfaces within single beds". The structures discussed have paleocurrent implications and inferentially, give an insight into the paleogeography of ancient sedimentary basins. Genetic interpretations of structures are backed up by simple qualitative experiments, and has displayed photographs of natural specimens face-to-face with their experimental analogues. These simple experiments, in the words of the author, help geologists "to test and investigate certain concepts suggested by field observations and to stimulate the imagination of investigators".

The structures discussed here have been divided into two groups: (i) erosional markings produced by scouring action of the current or by impact of transported objects (tools) upon a cohesive substratum, and (ii) deformational structures resulting from interaction between the flowing and depositing current and the bottom, or from mutual interpenetration of soft-sediments differing in density and kinematic viscosity. The theoretical and experimental backup in generating deformational structures have been deftly handled.

The experiments conducted in generating various erosional and deformational structures are

simple, easy to follow, and can easily be duplicated in the laboratory with slight imagination. I am sure, Indian students will be enthralled if these simple experiments are conducted before them. At the least, Indian students of earth sciences can easily be taken to natural laboratories, e.g., river valleys, deserts, or coastal sea beaches, where they can see for themselves many sedimentary structures in the process of formation. I am confident, this excercise will surely spark the imagination of students.

While many of the erosional sedimentary structures discussed here, their mechanism of generation and theoretical background are dealt with in various text books (like those of Pettijohn, (1975), Leeder, (1982), Collinson and Thompson, (1982), Fritz and Moore, 1988), deformational structures have not received much attention. In this respect, the present paper has fulfilled that requirement.

Prof. Dzulynski has divided deformational structures into two: (i) sedimentary structures showing non-mobile convective patterns, and (ii) convective deformational structures in mobile systems. The experiments and discussions are not available in any of the available text books on sedimentology, and will immensely help students of sedimentology.

Prof. Dzulynski has further stressed the fact that many of the structures, arbitrarily classified into distinct types, are actually "genetically consanguineous sedimentary structures", i.e., many of these structures, despite their wide spectrum of morphologies, "may be attributed to the same or similar formative processes. A large number of such structures represent the 'frozen' stages of one formative process. In geologic literature, such stages have been commonly assigned different names and regarded as genetically unrelated features". This is an important observation. Thus change in morphology, Prof. Dzulynski stresses, of prod markings of flute markings occurs consecutively without a clear separation between them. The differences in morphology of sole markings is nothing but a reflection on mechanical behaviour of the sediment involved in their formation. If the bottom sediment is incoherent sandy particles, the grains are rearranged to form closely spaced ridges aligned parallel to flow. If, on the other hand, the bottom sediment is plastic with a high degree of ductility, the same current may result in deformations with little entrainment of particles.

Prof. Dzulynski thus stresses on the fact that there is no contradiction between 'erosional' and 'deformational' structures.

Prof. Dzulynski has also stressed on the fact that soft-sediment deformation may be contemporaneous with, or postdate final deposition, and "it is often impossible to designate the deformation structures clearly in terms of their time of formation vis-a-vis the time of final deposition". He has also cleared the misconception that deformation structures alone may provide information on the direct cause of deformation.

Prof. Dzulynski concludes with a note of warning concerning analogies based upon similarity in morphology of deformational structures vis-a-vis interpretation. In his own words, "nature has been prodigal in providing different mechanisms for bringing about morphologically similar structures ..... Consequently to assess the true nature of deformations in sedimentary rocks it is necessary to take into account the whole assemblage of environmental and related data". Students of earth sciences are to note this observation.

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