

S-035 Keynote address

Significance and Problems of Event Sedimentology

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Why event sedimentology? Event sedimentology is interesting. However, this may not be the most fundamental reason for why many researchers are attracted to event sedimentology. Other reasons may be 1) several violent disasters induced by gigantic natural events have occurred recently and will also occur in future. Sedimentary records of these events provide useful information for analyzing the processes of various events and disasters. 2) Long time range investigation is inevitable for the understandings of the nature of repetitive event phenomena. And, the event sediments are the only reliable records of phenomena that occurred in the earth's past.

Gigantic events and disaster Seismites, debris flow deposits, flood flush deposits, inundites and so on have been studied in sedimentology to obtain information for disaster prevention. Tsunamiite sedimentology is also reaching to new marked development. For example, the largest extreme of entrainment of tsunami water in a coastal region can be examined based on the sedimentary records of long time range, namely historical and geohistorical scales. A search of the threshold value of changes from a linear (or gentle) pattern to catastrophe or chaos (or freeze) based on sedimentary records can be very useful. The most fundamental principle of disaster prevention is to diminish the social causes of that destruction or disasters. In this point of view, the development of social sedimentary geology, including studies of artificial basement strata are very important. The impact of the human civilization and their byproducts is growing rapidly in many dangerous regions around the earth. Sedimentologists must play a more important role in this field of "social geosciences".

A better understanding of nature The studies of sedimentary records can play a significant role in obtaining a 4-dimensional knowledge of nature. In other words, a) sedimentary records is inevitable for clarifying the history of the universe, our native planet with every living things, and the world of our human beings, and b) records are needed for an overall study of the 4-dimensional pattern of nature. Among those records are ones of episodic phenomena and of periodical change, including sequence stratigraphy developed over the past twenty years. However, one very important subject which should be investigated now is sedimentary information about the mutual relationship between

those two phenomena. Investigations like this should develop further towards the relationships between many other sorts of 4-dimensional structures such as linear patterns, rhythms, episodic changes, explosion, chaos, fluctuation, fractals and so on of various degrees. Freeze and sedimentary freeze are examples of paradigms proposed recently.

How to study sedimentary events The most important problem to be pointed out here is the need of synthetic studies and a bird's eye view. The very rapid development of various sciences actually leaves a lot of "blind spot". This problem can happen also in the field of sedimentology. The fundamental sedimento-graphical technique should be preserved. Mutual relationship between grain-size and constituent minerals and bio-remains should be paid more attention. The partition of samples based on grain-sizes should provide a lot of significant information for examining the sedimentary processes of clastic sediment as has been demonstrated by the present author. Tsunamiite sedimentology is most characteristically in need of the synthetic approach because of the many various features of tsunami-induced sediments.

Democracy and event sedimentology The biggest blind spots in science are the processes with time range scales of tens ~ hundreds of years. The overlooked area of concern has been out of interest among geologists who have a more common interest in the area of geological time-scales, though they may also make studies on Modern sediments. On the other hand, researchers in civil engineering do not look ahead to time range of longer than tens of years. The lack of study of threshold after a long time resulted in the occurrence of numerous "artificial" disasters. Sedimentologists are responsible to fill up this research gap. Democracy can be an important point when performing our responsible work. Citizens, farmers, fishermen and so on, who live in a problem area and are afraid of disaster, often become aware of the risks which are not noticed by many specialists. Discussion and co-work between specialists and those who have been affected or those people who are suffering from a specific disaster in some future time are very effective in many cases. Social education toward scientific thinking is important and a life lived in peace is an indispensable condition for such an education. It is the time to strike for event sedimentology and for peace.