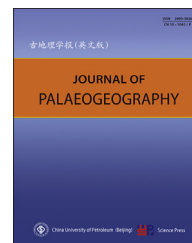


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Multi-origin of soft-sediment deformation structures and seismites

A successful symposium of “Multi-origin of soft-sediment deformation structures and seismites”

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Abstract A great progress has been made in researches of soft-sediment deformation structures (SSDS) and seismites in China. However, the research thought was not open-minded. About the origin of SSDS, it was almost with one viewpoint, *i.e.*, almost all papers published in journals of China considered the beds with SSDS as seismites. It is not a good phenomenon. In order to change this phenomenon, in early 2016, Feng *et al.* wrote a paper “*Researches of soft-sediment deformation structures and seismites in China — A brief review*” as “to cast a brick to attract the jade”, emailed this paper to many geologists in China and other countries, and invited them to write papers for the symposium of “Multi-origin of soft-sediment deformation structures and seismites”. “*The seismite problem*” by Prof. G. Shanmugam is the first paper that we have received.

The symposium was successfully held in September 24, 2016 at Henan Polytechnic University, Jiaozuo, Henan Province, China. The products of this symposium are as follows: (1) The terms “SSDS” and “Multi-origin of SSDS” were accepted by numerous geologists. (2) The definition of seismites by Seilacher (1969), *i.e.*, “fault-graded beds interpreted as seismites”, should be obsoleted, however, the definition by many geologists today, *i.e.*, “the seismites are the beds with SSDS really induced by earthquakes”, should not be obsoleted and should be retained. (3) The term “seismites” should be strictly restricted to the beds with SSDS that are really induced by earthquakes. (4) The clastic injections are also with multi-origin, and they cannot definitely be the seismites and may not be the exact criteria of *in-situ* earthquakes. (5) The most important product of this symposium is that the phenomenon of almost one viewpoint of the researches of SSDS and seismites in China has been changed eventually.

Keywords Soft-sediment deformation structures (SSDS), Seismites, Clastic injections, Symposium, Practice

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1. Introduction

The symposium of “Multi-origin of soft-sediment deformation structures and seismites” was successfully held on September 24, 2016, at the 14th National Conference of Palaeogeography and Sedimentology held during September 23–25, 2016, at Henan Polytechnic University, Jiaozuo, Henan Province, China.

The symposium received 7 Chinese full text papers in which one paper has been published in the *Journal of Palaeogeography (Chinese Edition)*, Vol. 18, No. 5, 2016; and 6 English full text papers in which 4 papers have been published in the *Journal of Palaeogeography*, Vol. 5, No. 4, 2016. There are 10 papers orally presented at the symposium. More than 200 geologists attended the symposium.

It is the first symposium about “Soft-sediment deformation structures (SSDS) and seismites” in China, and it is likely to make the most important influence on the researches of SSDS and seismites in China and other countries.

Why did we organize this symposium? It is necessary for the researches of SSDS and seismites in China.

During the past 30 years (1987–2016), a great progress has been made in researches of SSDS and seismites in China. However, the research thought was not open-minded. About the origin of SSDS, it was almost with one viewpoint, *i.e.*, almost all the papers published in journals of China considered the beds with SSDS as seismites. It is not a good phenomenon.

In order to change the phenomenon of one viewpoint, in early 2016, Feng *et al.* wrote a paper “*Researches of soft-sediment deformation structures and seismites in China — A brief review*” (Feng *et al.*, 2016) as “to cast a brick to attract the jade”, emailed this paper to many geologists in China and other countries, and invited them to write papers for the symposium of “Multi-origin of soft-sediment deformation structures and seismites”, to orally present their papers at the symposium, and to discuss the problems of SSDS and seismites. The excellent papers will be published in the *Journal of Palaeogeography (Chinese Edition and English Edition)*.

Our proposal has got active responses from geologists in China and other countries, and we have received many papers.

“*The seismite problem*” by Prof. G. Shanmugam is the first paper that we have received from those geologists invited by us.

At the beginning of the symposium, I presented: (1) 100 copies of Vol. 5, No. 4 of the *Journal of Palaeogeography*, which included the article “*Researches of soft-sediment deformation structures and seismites in*

China — A brief review” by Feng *et al.* (2016), the article “*The seismite problem*” by Shanmugam (2016), and two articles “*Seismites resulting from high-frequency, high-magnitude earthquakes in Latvia caused by Late Glacial glacio-isostatic uplift*” and “*The response of stromatolites to seismic shocks: Tomboliths from the Palaeoproterozoic Chaibasa Formation, E India*” by Van Loon *et al.* (2016a, 2016b); (2) 100 copies of Vol. 18, No. 5 of the *Journal of Palaeogeography (Chinese Edition)*, which included the article “*Records of the Pleistocene seismic events in Tancheng Maipo, Shandong Province*” by Zhang *et al.* (2016); (3) 50 copies of the Chinese version of “*Researches of soft-sediment deformation structures and seismites in China — A brief review*” by Feng *et al.*; (4) 50 copies of the Chinese version of “*The seismite problem*” written by Shanmugam and translated by Feng and Liu; (5) 50 copies of the Chinese version of “*Preface of the Chinese version of the seismite problem*” by Feng, to participants as references of my keynote speech of the symposium. Criticisms and corrections are heartily welcome.

2. Practice is the sole criterion for testing truth

Tse-Tung Mao (Mao, 1937) said: “*Many theories of natural science are held to be truth not only because they were so considered when natural scientists originated them, but because they have been verified in subsequent scientific practice. ... The history of human knowledge tells us that the truth of many theories is incomplete and that this incompleteness is remedied through the test of practice. Many theories are erroneous and it is through the test of practice that their errors corrected. That is why practice is the criterion of truth*”.

Xiao-Ping Deng (Deng, 1982) further said: “*Practice is the sole criterion for testing truth*”.

The task of the symposium is that we should utilize our practice during the 47 years (in the world) and 30 years (in China) to test whether the definitions, formation processes, and origin theories of SSDS, seismites, 震积岩 (Zhenjiyan), clastic injections are complete and correct or not. If the theories are incomplete or erroneous, we should remedy them.

After the symposium, our knowledge will be tested again by the geological practice in China and other countries.

It is the process of “*practice, knowledge, again practice, and again knowledge*” (Mao, 1937). I believe that the definitions, formation processes and origin theories of SSDS, seismites, 震积岩 (Zhenjiyan), clastic

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