

Summary of:

## **Неожиданный поворот в споре о мантийных плюмах**

(An unexpected turn in debates about mantle plumes)

by

Alexei Ivanov

*Troitsky Variant*, No. 13N(839), p. 8, 1st October, 2008.

<http://www.scientific.ru/trv/>

A landmark paper on the Emeishan basalts by Ingrid Ukstins Peate and Scott Bryan was recently published by *Nature Geoscience* (2008, v. 1, p. 625-629; <http://www.mantleplumes.org/WebDocuments/PeatBryan2008.pdf>). *An unexpected turn in debates about mantle plumes* is a popular article I wrote for the Russian scientific newspaper “*Troitsky variant*” (TrV) about the importance of this paper to the debate regarding the existence of mantle plumes.

In the article, the history of hotspot and plume theories is briefly summarised, focusing on the starting plume model of *Griffiths & Campbell* (1990). After the Fort William, Scotland conference of 2005 (<http://www.mantleplumes.org/Chapman/Information.html>), Campbell published articles re-iterating the predictions of the starting plume model. One prediction is kilometre-scale uplift prior to the eruption of flood basalt provinces.

By 2005 it was already known that such uplift did not occur prior to Siberian flood basalt eruption or Ontong Java plateau formation. These are the two largest Phanerozoic flood-basalt provinces in continental and oceanic environments respectively. Consequently, the smaller Emeishan flood basalt province in China was cited as “the best-documented example of domal uplift” (*Elements*, 1, 268). The works of Chinese geologists published in the international literature a few years before were cited.

Ukstins Peate and Bryan had the opportunity to visit Emeishan during the IAVCEI 2007 meeting held in China. On the basis of what they saw, they re-interpreted the geological data to conclude that there was no evidence for uplift. Their paper is well-illustrated with 24 photographs, distributed throughout both the main text and the supplementary material. Now every field geologist can see for him/herself that Emeishan flood basalts erupted in a shallow marine environment and not on top of a high dome. No pre-volcanic uplift occurred prior to the eruption of the Emeishan flood basalt province.

Will the failure of one of the key predictions lead to the downfall of the starting plume model? It seems not. Inconsistencies between the predictions and factual observations were already known, but data do not sway many proponents of the model. It may be that, until Hawaii, the type

example of a plume (where there is also no evidence for precursory uplift) is shown to be not plume-related, many geologists will continue to assume that plumes are widespread elsewhere throughout the world.

Griffiths, R. W., and I. H. Campbell (1990), Stirring and structure in mantle plumes, *Earth planet. Sci. Lett.*, **99**, 66-78.

Campbell, I. H. (2006), Large Igneous Provinces and the mantle plume hypothesis, *Elements*, **1**, 265-269.