

A definitive guide to the great mantle plume debate

Geoscientists' heightened debate on the existence of mantle plumes is highlighted in a new volume published by the Geological Society of America. *Plates, Plumes, and Planetary Processes* includes both chapters advocating the plume hypothesis and chapters arguing for shallow-based alternatives as explanations for surface volcanic regions known as "hot spots."

"This is the first volume in which roughly equal numbers of plume-advocate and alternative-advocate chapters were actively sought," said volume editor Gillian Foulger, Department of Earth Sciences, Durham University, Durham, UK. "We wanted to focus squarely on challenge and debate, rather than assumption of preferred theories."

Until 2003 discussion of mantle plumes consisted largely of describing observations consistent with the plume hypothesis on one hand, and highlighting weaknesses in the theory on the other hand, explained Foulger. In order to advance the debate in a positive way and stimulate further research, a Geological Society of America Penrose Conference that year focused on development of alternative explanations for observations apparently unexplained by the plume hypothesis. GSA subsequently published *Plates, Plumes, and Paradigms* in the fall of 2005. An American Geophysical Union Chapman Conference later that year reflected another upsurge in enthusiasm for debate and provided the impetus for GSA's latest publication.

Foulger and co-editor Donna Jurdy, Department of Geological Sciences, Northwestern University, Evanston, Illinois, USA, established a particularly rigorous review process for papers submitted.

"We chose reviewers likely to advocate contrasting viewpoints in order to expose authors to the most challenging criticisms possible, and to encourage confrontation of difficulties," said Foulger. "We also posted chapters on the Web, allowing open, formal discussion of them for a period of three months."

Source: Geological Society of America

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