

THE NATURE, ORIGIN, AND FATE OF A GIANT OCEANIC PLATEAU: ONTONG JAVA PLATEAU

Dr. John Mahoney, University of Hawaii

Volcanic oceanic plateaus are the submarine counterparts of vast continental flood basalt provinces such as the Columbia River Basalt, Siberian Traps, and Deccan Traps. The currently preeminent scientific model attributes most plateaus and flood basalts to the ascent of new mantle plumes to the base of the plate. By far the largest of these features is the Ontong Java Plateau, in the western Pacific, with an area equivalent to that of Alaska and a crustal volume of 40-50 million km³. Basement basalts drilled by ODP and exposed in the Solomon Islands indicate that most of the plateau's crust formed very rapidly 120 million years ago, suggesting that this plateau may represent the largest volcanic event on Earth in the last 200 million years. The basalts are high-degree partial melts from a mantle source that was broadly similar to those of some present hotspot-type ocean islands, such as Hawaii. The relatively recent Ontong Java – Solomons arc collision illustrates the considerable difficulty of subducting large plateaus and suggests that such edifices are likely to be an important means of continental growth. Dr. Mahoney served as co-chief scientist on Leg 192 and as an igneous petrologist on Legs 130 and 183.