

Manchester Geological Association

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Plate Tectonics Explained?

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Plate tectonics is the unifying theory in Earth Sciences, explaining many key aspects of Earth processes and history, and providing a hugely useful framework for data collection, integration and understanding. Basic elements of Earth structure that control and result from the operation of plate tectonics are well understood. Processes like isostasy, continental drift, volcanism and earthquakes are all well explained within the plate tectonic framework. The theory also allows us to collect data to understand more and more about how these processes have changed through time, including gaining insight into how and when plate tectonics started. We have also added important new elements to the plate tectonic model as our understanding has developed, for example related to vertical motions of the Earth surface produced by mantle convection. However, as in all areas of science, it seems that the more we learn, the more we learn we do not know, so plate tectonics is still an evolving theory, with further explanation of key processes required. Important contributions are now being made by computer models that let us collect together everything we know about plate motion through time, and to explore the physics of plate boundaries so that we can finally start to properly understand the various complex forces that drive plate motion.