

feature between continental and oceanic plates, with no distinction made between corresponding mantle components. That is, the continental mantle was seen as being governed by the same laws of boundary-layer thickening and subsidence that worked so well for the oceans. This simple and elegant model, however, has now confronted the features of the Archean cratonic mantle (as discussed in detail in the book): a thick, buoyant, seismically fast, lithosphere that is significantly depleted in basaltic components but enriched in incompatible trace elements compared to the oceanic upper mantle.

The difficulty appears not to lie primarily in the difference between oceanic and continental mantles, however. The point emphasized in several chapters is that the Phanerozoic and Proterozoic continental mantle is in fact petrologically, chemically, and seismologically similar to the mantle beneath old oceans. Such a conclusion is very important, since it implies that the most fundamental difference is between Archean and post-Archean rather than between continental and oceanic mantle. How this distinctive Archean mantle actually formed remains an intriguing question. The diamond inclusion data (chapter 3) suggest that it formed contemporaneously with the crustal rocks, rather than by the gradual thickening from thermal cooling. The oxygen isotope data discussed in chapter 7 argue for the incorporation of sea water in eclogitic nodules, suggesting that parts of the mantle were at some point involved in an ocean-related process, such as subduction.

While this book has many strengths, there are two areas of weakness that should be mentioned. First, there is a notable absence of synthesis, and given the unavoidable differences of opinions and differing orientations of the authors no one chapter provides a coherent overview of the multitude of existing constraints. Second, in some of the chapters there is a tendency to mix observation, interpretation, opinion, and speculation without warning the reader which is which. On balance, however, this book is worthwhile reading for anyone who seeks a full understanding of the continents.

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