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By using finite earthquakes, we show there exists a homeomorphism Φ between the real analytic Teichmüller space T_n of a set of $n+3$ variable labeled points cyclically arranged on the unit circle and the interior of the n -dimensional associahedron K_{n+2} . We also show how to obtain the faces of a compactification \overline{T}_n of T_n by letting certain finite earthquake parameters approach ∞ . The homeomorphism Φ naturally extends to these faces so that they themselves are realized as products of lower dimensional Teichmüller spaces. Without using Teichmüller's theorem, we show that T_n is isomorphic to an n -dimensional open ball. Furthermore, the relationships among the faces of the associahedron K_{n+2} provide a combinatorial view of how pieces of T_n are sewn together to form the interior of K_{n+2} . (Received January 22, 2007)