PLATE TECTONICS · PART 6 OF 9 · AGES 11–16

From Continental Drift to Plate Tectonics

How a rejected idea about moving continents became the theory that explains earthquakes, volcanoes and mountains.

1596 — Ortelius spots the fit
Map-maker Abraham Ortelius suggests the Americas were torn away from Europe and Africa, judging by the shapes of their coasts.

1912 — Wegener: continental drift
Alfred Wegener proposes that all the continents were once joined in one supercontinent and have slowly drifted apart.

1915 — The Origin of Continents and Oceans
Wegener's book sets out his evidence: matching fossils, rocks and mountain ranges, and ancient glacier traces in hot places. Most geologists reject it.

1929 — Holmes: mantle convection
Arthur Holmes argues that heat makes the mantle churn in slow convection currents that could carry continents. Few geologists take notice.

1950s — Mapping the ocean floor
Ocean surveys reveal a global chain of mid-ocean ridges, thin sea-floor sediment and strange magnetic stripes in the rock.

1962 — Hess: seafloor spreading
Harry Hess proposes that new sea floor forms at mid-ocean ridges, spreads outwards and sinks back into the mantle at trenches.

1963 — Vine and Matthews: magnetic stripes
Fred Vine and Drummond Matthews (and, separately, Lawrence Morley) show the stripes are mirror images either side of the ridges.

1965 — Wilson: transform faults
J. Tuzo Wilson describes a third type of plate boundary, where plates slide past each other without making or destroying crust.

1968 — Drilling clinches it
The ship Glomar Challenger drills the Atlantic floor: rock gets older away from the ridge. Plate tectonics becomes the accepted theory.

Right idea, missing engine

Wegener's evidence that the continents had moved was strong, but he could not explain how. The answer came from the ocean floor, decades after his death in 1930.

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7. Staying Safe in an Earthquake: Drop, Cover and Hold On

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