

## Mobile continents and fixed published opinions

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In the early years after Darwin, biologists could be classified as either *creationists* or *evolutionists*. Similarly, after Alfred Wegener began publishing on continental displacement (1912, 1915, 1920, 1922, 1924, 1926, 1929), geologists could be classified as *fixists* or *mobilists* (terms *fixisme*, *mobilisme* introduced by Argand, 13th IGC in 1922).

Some fixists must have become mobilists as new evidence appeared, but such conversion was not something to publish. Of over 50 scientists who published as fixists, I have found none that later published as mobilists. And of over 50 mobilists, I have found none that had previously published as fixists. Apparently scientists felt they had to save face for themselves and their institutions in their publication records.

Chester Longwell of Yale rejected Wegener's mobilism from the 1920s until the plate tectonic revolution in the 1960s. In 1968 he wrote: "*Although partisans favoring drift may have been right, they based most of their case on the wrong reasons and were unable to visualize a mechanism.*" But Wegener's reasons were not wrong. His hypothesis is still somewhat misunderstood, and unethical tactics by his detractors have gone unmentioned by recent historians.

Wegener did not postulate a drifting mechanism and consistently used the neutral expression *continental displacement* (Verschiebung). The misleading label *continental drift* came from the symposium volume *Theory of Continental Drift* published by the AAPG in 1928. This book includes a host of negative judgements without documentation. Consider the following example: Wegener was a climate expert; he and his father-in-law Wladimir Köppen, originator of today's Köppen Climate Classification, had published a ground-breaking book entitled *Die Klimate der geologische Vorzeit*. It correctly deduced climate belts across Pangaea, and was the first to adopt Milancovic's cycles for the Pleistocene. But an author in the AAPG volume was allowed to write: "*Wegener obviously does not know what geological climates were like,*" without any justification for this statement. "*This is too vast and complicated a subject to attempt to elaborate here in even the briefest sort of a way.*" This symposium volume, with many such examples, by many different authors, legitimized the exclusion of Wegener's hypothesis.

Charles Schuchert (Yale) and Bailey Willis (Stanford) stubbornly maintained the discredited idea of land bridges, in order to avoid mobilist interpretations. Wegener's continental displacements and climate belts would invalidate parts of their established paleogeographic reconstructions, but not within their lifetimes. In his *Historical Geology*, the standard textbook for generations of American students, Schuchert mentioned Wegener's continental drift only once, to relegate it to "*the realm of speculation.*" He contrived his maps and discussions to steer clear of Wegener's attractive hypothesis. Students reading his textbook were indoctrinated early in fixist ideas.

## **An electroplate tectonic hypothesis in 1861**

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. In modern plate tectonic theory, continents move with lithospheric plates across the surface of the globe. Old material is consumed at the leading edges of moving plates, and new material is created at the trailing edges. Most of the continents have been displaced northward since the break-up of the supercontinent and the opening of the Atlantic Ocean. European crust has moved from the southern hemisphere to its present northern position.

. Just such a hypothesis was published by the popular-science author John Henry Pepper in *The playbook of metals* in 1861. This book on geology, mining and metallurgy was reprinted many times. But the bizarre tectonic hypothesis went unremarked by contemporary geologists, and the plate tectonic revolution had to wait a hundred years. Now the beauty of this early tectonic model can be appreciated.

. Pepper illustrated the model using two dramatic illustrations from the book *La création et ses mystères dévoilés* by A. Snider in 1858. The two globe maps accurately depicted the continents, first as part of a supercontinent, and then broken up to form the Atlantic Ocean. Pepper was well versed in all aspects of science, including the latest results of Darwin's biology and Lyell's geology. Many of Pepper's geological ideas, including a mechanism for creation and destruction of crust, came from discussions with the mining geologist Evan Hopkins, who had published books *On the connexion of geology with terrestrial magnetism* in 1844, 1851 and 1855.

. In the process of electroplating, an electric current dissolves metal at one pole and deposits metal at the other pole. Hopkins imagined the Earth's magnetic poles to supply the current for electrolyte solutions to create crust near the south pole and consume crust near the north pole. Hopkins demonstrated that secondary mineral veins form from solutions, not from molten material. Solutions were also capable of dissolving solid rock. Thus crust could be both formed and destroyed by aqueous solutions.

. In Hopkins' global tectonics, sedimentary rocks are deposited as the crust moves northward. He applied his extensive experience with fossils, stratigraphies, and deformation in both the southern and northern hemispheres. He interpreted the Cambrian to Silurian fossils of northern Europe as having been deposited in the southern hemisphere frigid zone. The Carboniferous coal formation formed when Europe had moved to the southern temperate zone. The Oolitic or Saurian group was from the southern tropic zone. The Cretaceous and Tertiary reflect northern tropic latitudes, and the alluvial deposits were from the northern temperate zone.

. Hopkins considered magnetism to be a polar gravitational force, drawing crust northward to its ultimate demise near the north pole. Pepper summarized these ideas to help explain how coal from tropical jungles is now found in temperate England, Europe and America. His hypothesis could now be called the *Pepper-Hopkins electroplate tectonic model*.