

LAURENTIA

j18 Laurentia < Early Paleozoic paleocontinent >

Yes, yes, yes that's as may be, my informants tended to retort, impatient, and more eager to get to the nut of the story than to philosophise about the state of the nation. *But that's not the half of it.* The plain fact of the matter is: *she's Welsh!* —Simon Winchester.¹

Preamble Areas of continents that have not undergone fold-mountain building during the Phanerozoic Eon are called *cratons*; areas that have are called *mobile belts*. Flexings that have broadly arched and basined the craton are called *epeirogenic deformations* (Gk. *epeiros* “dry land” [*sic*]).³ Essentially flat-lying Phanerozoic sediments on the craton are called *platform sediments*. Where these are absent and Precambrian rocks are extensively exposed, the craton is called a *shield*.

In search of Laurentia North America came to be 75 million years ago, when the Labrador Sea, Davis strait and Baffin Bay began to open defining the western margin of Greenland-to-be. What was fragmenting was Laurasia which was one of two fragments, the other being Gondwanaland, that beginning mid-Jurassic had resulted from the splitting of the supercontinent Pangea by left-lateral transcurrent faultings through what now are the Mediterranean, the Caribbean, and the associated opening between of the southern North Atlantic. Pangea had been in existence for some 40 million years beginning in the early Triassic. It had been assembled from prior paleocontinents. Of these, the last to join was North Paleochina. It joined in the early Triassic at the coast of what by end-Permian was a northern accretion of former Paleosiberia and Paleokazakhstan. This completed the Northern Laurasia realm of Pangea. Until then, Pangea-to-be was comprised of Southern Laurasia and Gondwanaland realms. Before the beginning of the Pennsylvanian, these realms had been separate paleocontinents: ORS (Old Red Sandstone) and Gondwana, respectively. ORS had formed in the Early Devonian from a joining of Avalonia paleoterrane with the sutured, former, Paleobaltica and Laurentia paleocontinents.² Gondwana had been in existence since the mid-Cambrian.

Laurentia Today, North America, Greenland, and easternmost Europe have fragments of the before-Laurasia, before-Pangea, before ORS, paleocontinent called *Laurentia*. (Areas of the Laurentian craton are now the North American platform south of the Great Lakes and the Canadian and Greenland shields. Areas of the Laurentian marginal mobile belt are now most of Scandinavia, Scotland, Northern Ireland, and the Appalachians.)

Geographically Laurentia ceased to exist as a paleocontinent when during the Devonian suturing (Acadian orogeny) with Paleobaltica closed the Iapetus ocean in northeast to southwest in direction.

During the Paleozoic, the Laurentian craton flexed into a broad, central, north-trending up-arch and several wide, slowly deepening, basins. Platform sediments accumulated on Laurentia under several, very different, circumstances of its location, epeiric-sea floodings, and from appearing and eroding mountains in its marginal geosyncline. Laurentia's Paleozoic peregrinations did cause it to collide briefly with Gondwana during the Ordovician. The orogeny that resulted is called the *Taconic*. Other than that, Laurentia was a paleocontinent separate from others during the Early Paleozoic.

Say kumbaya⁴ Without any knowledge of Laurentia's wanderings, mergings, and fragmentations, and by assuming the fixity of continents principle, a deceptively simple story can be read: North American was either submergent when platform sediments accumulated or emergent when erosion lowered outcrop surfaces of these. The Cenozoic geosynclinal margin of North America and interior to it, a large fragment of the Paleozoic geosynclinal margin of Laurentia allows for a model of continental accretion.⁵ In short, in the fixity of the continent model, “North America” existed and episodically added to its thickness and to its area all through the Phanerozoic.

The principle of least amazement (Ocham's razor for geology) recommended the simple story as canon. Quibbles aside, this justified denial (not the river in Egypt!) of continental drift prior to the “in your face” paleomagnetic proof of it in the 1960s.⁶ The truth, we know, is far more complex than fixists ever imagined. Even so, concepts of *craton*, *platform*, and *geosyncline*, updated in ‘mobilst’ terms of plate tectonics, have value.⁷ *Note: a geosyncline* (following Dietz's lead, who in 1966 dropped the “syn” in describing its parts) is comprised of a *miogeocline* and a *eugeocline*.⁸ □