

Lovelock, Wegener, and maps in scientific controversies

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Famously, Wegener wrote that his first inkling of continental drift occurred to him as he studied a map of the world and noticed “congruences” of the African and South American coasts. Furthermore, mapmaking visualizations pervade his classic text *The Origin of Continents and Oceans*. His arguments for continental drift theory, including isostasy, paleontological data, polar wandering, mountain range and earthquake distributions across the globe, are all secured with detailed maps. Unfortunately, the multidimensional role of cartographic reason here has been downplayed. Wegener’s maps are not merely “words or pictures” (Oreskes 1999, 275).

In his classic *Gaia*, Lovelock has a literal map of the continental shelves, which are regions critical for carbon and oxygen cycles. More importantly, he relies on maps metaphorically. That Gaia functions physiologically to stabilize a complex system is a “map or circuit diagram” we can deploy. Moreover, as later captured in Tom Van Sant’s iconic composite image or map of the Earth, Gaia’s inspiring, holistic “fair face” has been observed by astronaut eyes and orbiting cameras. Gaia thus became self-aware, Lovelock asserts.

Cartographic reason—and maps from literal to analogical—play key epistemic and praxis roles in the Earth Sciences. This is so both for the investigation of the inner anatomy of the Earth (Wegener), and of the chemically active and far-from-equilibrium outer biosphere layers (Lovelock). Analyzing how maps structure data, channel theory, help formulate bold hypotheses, and launch trenchant analogies and metaphors helps illuminate the logic of the Earth Sciences, and of scientific practices more broadly.



(Gaia’s “fair face” as seen by Apollo 17, December 7, 1972.)