

# 3

## UNIFORMITARIANISM

*Often interpreted as ‘the present is the key to the past’, uniformitarianism has been an important concept influencing the development of Earth sciences since it was introduced in 1832. It is acknowledged as a stimulating paradigm influencing geomorphological thinking, but more recently has been critically reviewed, considered to be integral throughout science, and complemented by other concepts including actualism, gradualism and catastrophism.*

### **RELEVANT ARTICLES IN PROGRESS IN PHYSICAL GEOGRAPHY:**

Huggett, R.J. (1988) Terrestrial castastrophism: causes and effects, *Progress in Physical Geography*, 12: 509–32.

Huggett, R.J. (1994) Fluvialism or diluvialism? Changing views on super-floods and landscape change, *Progress in Physical Geography*, 18: 335–42.

Meadows, M.E. (2008) Quaternary environments: going forward, looking backwards?, *Progress in Physical Geography*, 36: 539–47.

### **UPDATES**

Two further articles by Vic Baker elaborate pertinent issues. In the first he shows how the invention of geological hypotheses involves both inductive inferences of the type Gilbert termed ‘empiric classification’ and abductive inferences. The testing and corroboration of geological hypotheses relies less on the correspondence logic of theoretical/experimental sciences, like physics, and more on the logic of consistency, coherence, and consilience that characterizes the investigative and historical sciences of interpretation exemplified by geology, and also applies to geomorphology:

Baker, V.R. (2014) Terrestrial analogs, planetary geology, and the nature of geological reasoning, *Planetary and Space Science*, 95: 5–10.

The second contends that if logic is viewed as a normative science of right reasoning, then various forms of uniformitarianism introduced in the late 18th and 19th centuries were logically flawed at their inception. He outlines how abductive (or retroductive) reasoning is both a methodologically useful and scientifically fruitful component for generating understanding that can be further elucidated by the deductive and inductive methods of Earth systems science:

Baker, V.R. (2014) Uniformitarianism, earth system science, and geology, *Anthropocene*, 5: 76–9.

It is argued that as the Anthropocene (see Chapter 16) proceeds limitations arise regarding the use of uniformitarianism as a principle by which to interpret Earth surface systems of the present and future so that all geoscientists need to critically reconsider whether the long-held assumptions of uniformitarianism are useful in the Anthropocene era:

Knight, J. and Harrison, S. (2014) Limitations of uniformitarianism in the Anthropocene, *Anthropocene*, 5: 71–5.

A recent review of uniformitarianism advocating a need to reconsider and investigate the epistemological underpinning of the Earth sciences is provided in: Romano, M. (2015) Reviewing the term uniformitarianism in modern Earth sciences, *Earth-Science Reviews*, 148: 65–76.

And a review in relation to the Anthropocene concludes that the anthropogenic present must act as a filter through which the past is interpreted when searching for keys to the future: Paul, J.D. (2015) A question of uniformitarianism: Has the geological past become the key to humanity's future?, *Anthropocene*, 9: 70–4.

Racki, G. (2015) Catastrophism and neocatastrophism versus cosmic hazard: Ager versus Alvarez; Cuvier versus Laplace, *Palaios*, 30: 432–34 provides a comment stimulated by:

Nield, T. (2011) *Incoming! :or Why We Should Stop Worrying and Learn to Love the Meteorite*. Granta, which challenges the view that meteorite strikes are always bad news for life on Earth.

A review of the limitations of uniformitarianism suggests that the profound environmental changes wrought by human activity over the past 300 years challenge the previous focus on past “natural” systems and the use of past environmental conditions to anticipate future anthropogenic environmental changes. MacDonald, G. M. (2017) The new nature: Limitations and prospects of the paleoenvironmental tradition in biogeography in the 21st century, *The Canadian Geographer/Le Géographe canadien*, 61: 41–51.