

UNIFORMITARIANISM

a15 Paradigm of the natural sciences < Hutton, *Theory of the Earth* >

I wish he would explain his explanation [*sic*]!

—Lord Byron impatient with Samuel Taylor Coleridge’s metaphysics.¹

A paradigm is a principle that underlies a whole branch of philosophy. Such a principle is *uniformitarianism*. This principle allows for natural science as it is studied today. Stated simply, uniformitarianism is the message that the way the world has been witnessed to change is an example of how it has always changed. For economy of thought, processes outside common experience or feasible demonstrability (the paranormal and mystical) are disallowed in our explanation of prehistory. James Hutton (**Figure a15.1**) revealed the focus of his science, beginning ca.1780, to physiocrat Adam Smith and Joseph Black (who in 1756 found that CaCO_3 heated gives off CO_2 and in 1762 discovered, named, but did not understand, latent heat)², founders with him of the “Oyster Club” (a convivial tea-totalling dining club that met every Friday at two o’clock in a tavern in the Grassmarket³ and had as members, luminaries as Robert Adam, Adam Ferguson, James Hall, Henry Mackenzie, John Playfair, William Robertson, Dugald Stewart, James Watt, Lords Daer and Monboddo) and to coal baron John Clerk of Eldin (who often geologized with him in the field) which was “An examination of the System of the habitable Earth with regard to its duration and stability.” This topic, read to the Royal Society of Edinburgh March 7 & April 4, 1785, was published as an article: *On the Theory of the Earth; or, An Investigation of the Laws Observable in the Composition, Dissolution, and Restoration of the Globe*, *Transactions of the Royal Society of Edinburgh*, I:209-304, 1788, and as a 2 volume book in 1795.⁴

In Hutton’s words: “the past history of our globe must be explained by what can be seen to be happening now.” This uniformitarian philosophy that made geology a natural science was revolutionary at the time because it required that Earth was old, incredibly so. This was contrary to the then common-sense view of a young Earth that stemmed from the teachings of St. Augustine,

Bishop of Hippo (AD 354-430).⁵ Hutton’s revolutionary finding was that: “Time, which measures every thing in our idea, and is often deficient to our schemes, is to nature endless and as nothing.”⁶ His comprehensive theory of uniformitarian geology was secular (not sectarian, a malaprop) in that to accept the long-term ability of erosion to remove mountains, as just one part of the rock cycle (*see* Topic a20), the brief timetable of biblical chronology had to be abandoned.⁷

Hutton’s reliance on heat to account (correctly) for basalt and granite and (incorrectly) for the induration of sandstone did not easily fit the then world-view of most savants (“geologists” did not exist). More acceptable was geognosy (a systematic, pragmatic, approach to acquiring knowledge about Earth) taught by Abraham Werner (*see* Topic a26). During the first part of 19th century two competing schools of thought existed. Those who championed Werner’s teachings became called *Neptunists* and those who came to champion Hutton’s were called *Plutonists*. □

Figure a15.1 James Hutton is “rather astonished at the shapes [the profiles of several antagonists (Kirwan is not depicted)] which his favorite rocks have suddenly taken.”⁸

