4 SCOTSMEN ARTICLE

James Hutton(3 June 1726 – 26 March 1797) was a Scottish geologist, naturalist, and agriculturalist. He originated the theory of uniformitarianism—a fundamental principle of geology—that explains the features of the Earth's crust by means of natural processes over geologic time. Hutton's work established geology as a science, and as a result he is referred to as the "Father of Modern Geology".

Hutton trained in medicine, but never practiced it. Instead, he did scientific research, helped to start a chemical industry, and farmed his estate. He is one of the founders of modern geology. He saw the Earth as the product of natural forces. Through observation and carefully reasoned geological arguments, Hutton came to believe that the Earth was perpetually being formed; he recognized that the history of Earth could be determined by understanding how processes such as erosion and sedimentation work in the present day.

Hutton hit on a variety of ideas to explain the rock strata he saw around him. After some 25 years of work, his *Theory of the Earth* was read to meetings of the Royal Society of Edinburgh in 1785. The books and works he published had widespread influence, not least on the up and coming young geologist Charles Darwin.

It was not merely the earth to which Hutton directed his attention. He had long studied the changes of the atmosphere. The same volume in which his *Theory of the Earth* appeared contained also a *Theory of Rain*. He investigated the available data regarding rainfall and climate in different regions of the globe, and came to the conclusion that the rainfall is regulated by the humidity of the air on the one hand, and mixing of different air currents in the higher atmosphere on the other.

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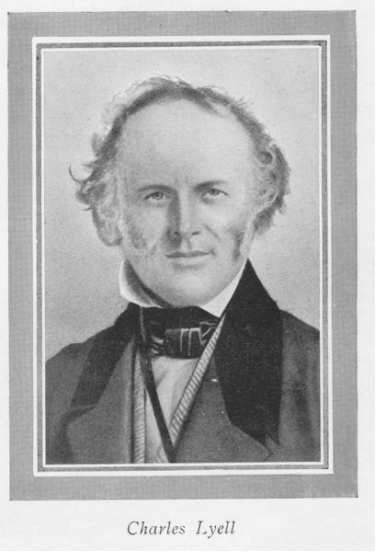

Charles Lyell

Sir Charles Lyell, 1st Baronet, (14 November 1797 – 22 February 1875) was a Scottish geologist. He was the foremost geologist of his day, and an influence on the young Charles Darwin. His work was rewarded with a knighthood, and later he was created a hereditary baronet.

The house of his birth is in the Scottish Lowlands. it is in the valley of the Highland Boundary Fault, one of the great features of Scottish geology. Round the house is farmland, but within a short distance to the north-west are the Grampian Mountains in the Scottish Highlands.

Charles would have seen this view from his house as a child. He was also fortunate that his family's second home was in a completely different area: at Bartley Lodge in the New Forest, England. Both these places lit his interest in the natural world.

Lyell was a rich man, and earned more money as an author. He came from a prosperous family, and worked briefly as a lawyer in the 1820s. He held was a Professor of Geology at King's College London in the 1830s. From 1830 onward his books gave him both income and fame. Lyell's *Principles of Geology* was his most famous and most important book. It was first published in three volumes, in 1830–33. The book was about the ideas of James Hutton, but with many additions, improvements and examples. The book made Lyell to be known as an important geological theorist. It was a work of synthesis, backed by his own personal observations on his travels.

The central argument in *Principles* was that *the present is the key to the past*. This was called by William Whewell 'uniformitarianism'. Geological remains from the distant past are explained by processes we can see operating now. Lyell's interpretation of geologic change as the steady accumulation of minute changes over enormously long spans of time was a big influence on his young friend, Charles Darwin.

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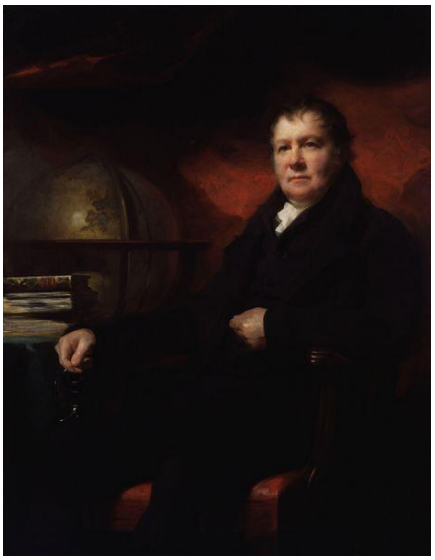
Rev Prof John Playfair FRSE, FRS (1748 – 1819) was a Church of Scotland minister, remembered as a scientist and mathematician, and a professor of natural philosophy at the University of Edinburgh. He is best known for his book Illustrations of the Huttonian Theory of the Earth (1802). In 1783 he was a co-founder of the Royal Society of Edinburgh. He served as General Secretary to the society 1798-1819.



John Playfair, a Scottish geologist and mathematician known for his explanation and expansion of ideas on uniformitarianism—the theory that the Earth's features generally represent a response to former processes similar in kind to processes that are operative today.
A professor of natural philosophy at the University of Edinburgh, Playfair was the first to propose that a river cuts its own valley and was also the first to recognize the transport role of glaciers. He wrote *Elements of Geometry* (1795), *Illustrations of the Huttonian Theory of the Earth* (1802), and *Outlines of Natural Philosophy* (1812–16).

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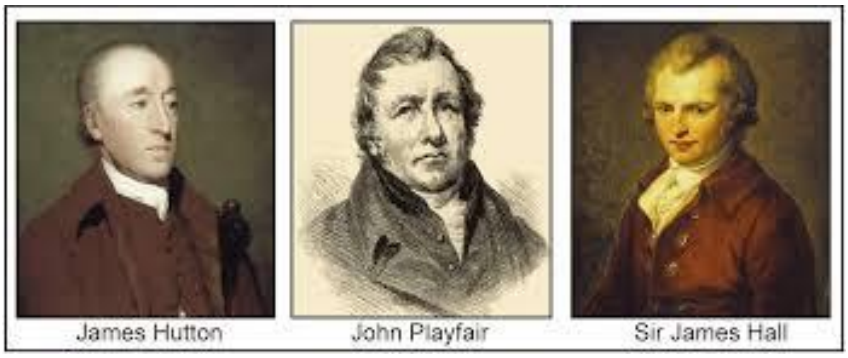
Sir James Hall, 4th Baronet, (1761 — 1832,), Scottish geologist and physicist who founded experimental geology by artificially producing various rock types in the laboratory.



Hall succeeded to his father's baronetcy in 1776 and thereafter studied at Christ's College, Cambridge, and the University of Edinburgh. He later became president of the Royal Society of Edinburgh.

For many years he rejected the belief of his friend, the noted Scottish geologist James Hutton that many rocks have an igneous origin, but eventually he came to believe that Hutton's views might be subject to experimental testing. By melting minerals and cooling them at a controlled rate, Hall found that he could produce different kinds of rocks. For example, he found that by heating calcium carbonate under pressure he could produce a rock closely resembling natural marble. He experimented extensively with igneous rocks from Scotland and showed that they were produced by intense heat and slow cooling of molten material. He showed that coal was recrystallized adjacent to dikes of whinstone (dark, fine-grained rock such as dolerite or basalt).

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