

Archibald Geikie on the Last Elevation of Scotland

by Leonard G. Wilson

In the 1850s a succession of geological discoveries startled the minds of thoughtful Christians. Former pile dwellings in Swiss lakes and shell mounds in Denmark demonstrated the prehistoric presence of humans in Europe. Although the absence of human fossils had been assumed to mean that man had not appeared in Europe until after the latest geological changes, in 1857 a human fossil skeleton was discovered in the Neanderthal in Germany. In Brixham Cave in Devonshire during the summer of 1858, William Pengelly found flint tools together with the bones of extinct animals and in the spring of 1859 Joseph Prestwich described flint implements found at St. Acheul, in the Somme Valley of France.

SLIDE: *Flint implement from St. Acheul*

At the British Association meeting the following September, Sir Charles Lyell confirmed that the flints of the Somme Valley were made by man. At the meeting, the Reverend Dr. John Anderson, a Presbyterian minister from Edinburgh, disputed Lyell's conclusions. Anderson saw no evidence that man had not been introduced upon the earth at "the usually accepted date." To Dr. Anderson, as to many devout Christians, the book of Genesis contained a true account of the origin of the world.

The geological age of the Somme Valley gravels containing the flints was uncertain. Similarly uncertain were the ages of terraces around the coasts of Scotland. The lowest terrace, about twenty-five feet above high tide level, formed a narrow strip of flat land around the Firth of Forth, along the banks of the Forth River, and beside the Clyde Estuary. In excavations at Glasgow, workmen had uncovered dugout canoes, stone tools,

and other artefacts, showing that people had lived in Scotland before its elevation above the sea. In 1838 James Smith of Jordanhill thought that the twenty-five foot terrace had been elevated before Roman times, because the Antonine Wall across Scotland terminated on the Clyde and on the Forth in relation to the existing sea level.

SLIDE: *Archibald Geikie*

In the spring of 1861, Archibald Geikie found what he took to be ancient Roman pottery in a sand pit near the shore of the Firth of Forth at Junction Road, Leith. If the pottery fragments were truly ancient, then the beach had been elevated since the time of the Roman occupation. The archaeological evidence from the twenty-five foot terrace would then indicate human presence only since Roman times. Geikie promptly wrote a paper on the Leith sand pit for the *Edinburgh New Philosophical Journal*. It appeared in July 1861.

SLIDE: *Geikie's section of the sand-pit*

Among seven beds that Geikie distinguished in the Leith sand pit, he emphasized Bed No. 5, describing it as “a regularly stratified deposit, with thin parallel interlaminations of sand and clay.” This bed contained the pottery that resembled ancient Roman pottery. Geikie had, he said, “no doubt, therefore, that the pieces of pottery ... are of Roman origin.” Consequently, said Geikie, “the evidence is irresistible that the land here has risen about 25 feet since the deposition of these littoral strata”. Equally irresistible, thought Geikie, was the conclusion that the elevation had occurred since Roman times. In view of the extent of geological changes within the historical period, man must be considered a relatively recent inhabitant of Britain. Geikie thus brought the archaeological evidence for human presence in the twenty-five foot terrace within the historical period.

When Geikie's paper appeared in July, Geikie himself was absent, thereby missing

the interest that his paper aroused at Edinburgh. At London the following winter, he delivered an extended version of his paper to the Geological Society. In opposition to Smith of Jordanhill, Geikie argued that the ends of the Antonine Wall had been built in relation to a sea level 25 feet higher than at present.

SLIDE: *William Carruthers*

Three months after Geikie presented his paper at the Geological Society, William Carruthers disputed Geikie's findings. Carruthers had been at Edinburgh the previous summer when Geikie's first paper appeared. In the Leith sand pit, Carruthers recognized the beds that Geikie described.

SLIDE: *Carruthers' section of the beds*

In Bed No. 5, which Geikie said was a stratified silt, Carruthers found no stratification. The bed had formerly been cultivated land. Scattered through it were pieces of pottery, oyster shells, bones, pieces of coal, coal cinders, and parts of tobacco pipes. Carruthers said that in Geikie's view, the tobacco pipes must either be Roman, or the shores of the Firth of Forth had risen since Sir Walter Raleigh introduced tobacco to Britain.

Two months earlier at the Royal Society of Edinburgh, the geologist Alexander Bryson also described tobacco pipes from Bed No. 5, inscribed with the letters "T. W." A manufacturer of tobacco pipes in Edinburgh said that "T.W." were the initials of his father-in-law, who had founded the business in 1814. Some of the pottery in Bed No. 5, Bryson said, was made near Edinburgh. Some were parts of glazed flower pots brought from Holland.

In the light of Bryson's and Carruthers's criticisms, Geikie might have been expected to withdraw his Geological Society paper. He did not. Instead he added a note,

saying that although attempts had been made to show that the beds at Leith were “merely artificial ground,” he was unable to change his opinion. In 1865 in his book *Scenery of Scotland*, Geikie repeated his opinion. Through the 1860s, Geikie thus continued to insist on the modern date of the last elevation of Scotland.

SLIDE: *David Milne Home*

In 1871 the Scottish laird David Milne Home published a book on the geology of the Firth of Forth. He cited Geikie’s opinion but presented evidence from Roman buildings, roads, and fords across the Forth River that the sea level in Roman times was not higher than now. He sent a copy of his book to Archibald Geikie, but Geikie took no notice of it.

SLIDE: *Antonine Wall and the Roman Road*

In 1872 Sir Charles Lyell came across Milne Home’s book and wrote to him to ask whether Geikie had responded to his arguments and whether any new evidence had emerged. Geikie had not responded, but, said Milne Home, in 1869 a remarkable Roman tablet had been found near the shore at Bridgeness, at the eastern end of the Antonine Wall.

SLIDE: *Distance slab ... at Bridgeness*

At about nineteen feet above high tide level, its location showed that the sea level had not changed since the Romans built the wall.

SLIDE: *Ground plan of projecting knoll*

The Roman tablet was on a whinstone knoll forming a promontory on the Firth of Forth. If the land had been twenty-five feet lower in Roman times, the sculptured tablet would have been six feet under water at every high tide. Milne Home showed also that Roman forts and a Roman road had existed along the Clyde on the lowest terrace that

Geikie thought was under water in Roman times.

SLIDE: *Old sea cliff*

In *Antiquity of Man* in 1863, Lyell accepted Geikie's argument for the elevation of Scotland since Roman times. In the fourth edition of 1874, Lyell cited Milne Home's evidence that the land around the Forth had not risen since Roman times. Geikie never forgave Lyell for presenting evidence to disprove his assertions. After Lyell's death, he sought to diminish Lyell's scientific reputation.