

Buckland's journey to the Continent in 1816

"Well Buckland is gone to Italy, so thank God we shall hear no more of this geology"

- an Oxford cleric on hearing of the journey

In 1816 William Buckland, George Greenough and William Conybeare travelled to continental Europe to study and compare the geology there with what they had been studying in Britain. This excursion is important as it resulted in the first detailed international stratigraphic correlation, which was published by Buckland two years later.



William Buckland, 1832

The hyaena skull in his hands is currently on display in the Museum.

The motivation for the excursion was clearly to advance geological science by studying at first hand the rocks of Europe, but the three men also toured the academic centres and met the leading continental theorists of the time. The Museum has recently uncovered a number of rocks collected on that journey.

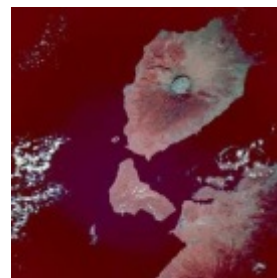
Who was William Buckland?

Dean William Buckland founded the scientific teaching of geology in Oxford, and brought together what would become the core of the Museum's geological collections. He was a man of enormous energy, being both a member of the clergy and a brilliant scientist. His account of the *Megalosaurus* bones from Stonesfield in Oxfordshire was the first scientific description of a dinosaur.

A display in the main court of the Museum highlights the importance Buckland's collection. Included are skulls of a woolly mammoth and a cave hyaena, ancient coprolites (fossilised faeces), ammonites, fossil plants, and an interesting array of curios including a petrified bird!

1816: rain and peace

1816 was an interesting year historically. Two events of the previous year had brought about dramatic changes in Europe. A major eruption of the volcano Tambora in Indonesia had released vast quantities of fine ash into the atmosphere. This took a year to spread globally and led to such major climate change that 1816 became known as 'the year without a summer'. In Europe crop failures in the cold, damp weather resulted in famine, rioting and disease. However, following Napoleon's defeat at Waterloo there was peace in Europe. This enabled contact to be established between the scientists of the different countries. There was also a burgeoning popularity in leisure travel. The Alps, France and Italy were the major destinations, with Lord Byron, exiled in Italy bemoaning the invasion of English tourists thus:



Tambora volcano, Sumbawa, Indonesia

"I wished to have gone to Rome; but at present it is pestilent with English - a parcel of staring boobies, who go about gaping and wishing to be at once cheap and magnificent. A man is a fool who travels now in France or Italy, till this tribe of wretches is swept home again... In Switzerland it was really noxious."

What is 'Learning more'?

'Learning more' presents a series of articles about the Museum and its collections. It is designed for older students, teachers, researchers, and anyone who wants to find out more about particular aspects of the Museum's work and its history. This article gives an account of William Buckland's journeys on the continent.

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Buckland's travelling companions

William Daniel Conybeare was born in 1787 and educated at Westminster and Oxford. Along with his elder brother John, who later became Professor of Poetry at Oxford, he pursued geological field studies around Oxfordshire and elsewhere.



He also travelled with Buckland to the north coast of Ireland in 1813, and later published a section and description of this coast in *Transactions of the Geological Society*. In 1814 William Conybeare married and became a curate in a country church. In the same year he published a paper on "A remarkable class of organic impressions occurring in nodules of Flint", showing evidence for predation of the included fossil shells. Later in his life he was to become a member of the French Academy and Fellow of the Royal Society. Together with Sir Henry de la Beche he founded the Bristol Philosophical Institute and Museum, and named the reptilian class of plesiosaurs.

George Bellas Greenough, was born George Bellas in 1778 and orphaned shortly after. His maternal grandfather brought him up and sent him to Eton, but also died while George was young, leaving him a fortune and a new



surname. He went up to Cambridge in 1795 but did not take a degree. Instead he left England to study Law at Göttingen where he befriended Samuel Taylor Coleridge. There he also studied Natural History and toured the continent, including the Harz Mountains, Italy and Sicily, before returning to England in 1801. After living in Cornwall and the Scilly Isles he settled in Parliament Street, London and joined the Royal Institution. Greenough became actively involved in science and in 1806 studied the geology of Ireland and its social history with Sir Humphrey Davy. Between 1808 and 1812 he was MP for Gatton

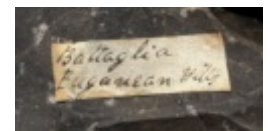
in Surrey. This constituency was notorious for having had at one time only one man eligible to vote, an archetypal 'rotten borough'. However, Greenough was a liberal politician of the school of Bentham, Romilly and Horner, who supported such radical policies as universal suffrage, abolition of the monarchy and a ban on slavery. Greenough's greatest achievements were in geology. He founded the Geological Society in 1807 and acted as its first president until 1811. He is credited with ensuring the independence of the Society against moves by the scientific establishment to incorporate it within the Royal Society. Academically, Greenough's forte was in mapping. He had a collection of maps on which he annotated geological information and in 1810 travelled around Britain adding and correcting boundaries. He carried out further fieldwork with Buckland and others to collect a sample suite to illustrate the *Geological Map of England*, which was published in 1820. Later in life he produced the first geological map of India.

The route

In a letter to Lady Mary Cole of 3rd April 1817

Buckland gave a detailed account of the route he had taken through Europe:

present-day Belgium, Holland, Germany, Poland, the Czech Republic, Slovakia, Austria, Italy, Switzerland and France.



Dolerite with a label in Buckland's hand

Geologically the journey mainly traversed Mesozoic sedimentary rocks, but also included famous fossil localities such as the bears' bone beds in a cave at Franconia (Germany) and the Monte Bolca fish quarries (Italy), volcanic rocks in southern Germany and in Italy, and the Alpine metamorphic belts. The German leg, during which they visited Werner and Goethe, has been studied by Torrens (see the reference below). After Germany Conybeare left the party and returned to England.

The portraits of Conybeare and Greenough were taken from "The History of the Geological Society of London", H. B. Woodward, 1907

After the excursion

Conybeare was the most successful of the three in writing up the findings of the excursion. Many observations of the tour are incorporated in Conybeare and Phillips' *Outlines of the Geology of England and Wales* (1822), a classic work of nineteenth century geology. In the *Annals of Philosophy* from January 1823 onwards he began (but never completed) a grand summary of the geology of Europe entitled *Memoir illustrative of a general Geological Map of the principal Mountain Chains of Europe*. The map was a coloured sheet covering the area south of the North Sea and north of a line from the Pyrenees to the Black Sea.

Buckland himself published a correlation of the German stratigraphy of Werner with the British stratigraphic record, in an appendix to a new edition of Phillips' *A selection of facts... of the Geology of England and Wales* in 1818. Attached to this was a table of the German strata "as sketched in a hasty manuscript note given by the late Herr Bergrath Werner in July 1816". This international correlation was the first in Buckland's attempts to produce a world-wide stratigraphy. For example, a more detailed correlation of the rocks of Switzerland with those of Britain followed in an address to the Geological Society in 1821. Always he used his many contacts at home and abroad to collect representative suites of rock and geological observations from many parts of the globe.

For all his radical politics, Greenough was the least able to accept new ideas in science. His *Critical examination of the First Principals of Geology* of 1819, supported the Neptunists. He mentions the excursion in his discussion of stratification in granite: "The stratification of granite at the Oschenkopf is recorded by M de Luc. Mr Buckland, Mr Wm. Conybeare and myself looked for stratification there, but in vain." However he then dismisses the Plutonist's argument by noting examples of unstratified sediments. In a letter to Lady Cole, written in 1820, Buckland is dismissive of Greenough's book and claims he has "a larger class than ever despite all that Mr Greenough has done in his book to discourage Geology".

The collection

Buckland's collection of rocks, fossils and bones, maps, sections and engravings and all the specimens sent to him from around the world was bequeathed to the University, and sent to the new University Museum in 1858. His daughter Mrs Gordon in her biography of 1894 laments that "The subsequent history of the collection is a melancholy record of neglect. Owing to a variety of causes, a great part of this valuable bequest to the University remains in the same condition (and with perishing labels) in which it was removed from the Clarendon 36 years ago." Sadly there was little change except that 36 years extended to 140! The Museum focussed on mineralogy and palaeontology, making considerable progress on building world-class collections, in those fields, but the rock collections notably Buckland's, MacCulloch's and Daubeny's, were consigned to basement cabinets and cardboard boxes.

The Buckland rocks were removed from cabinets, wrapped in newspaper and boxed in 1938. At this time an attempt to sort the collection into localities was made, but most of the samples from the 1816 excursion were in three boxes labelled "Various Rocks - Buckland Collection". Each sample was labelled with a locality in Buckland's hand writing on good quality paper of varying size but typically about 1 cm by 2-3 cm. The fact that most samples in these boxes coincided with localities on the route of the 1816 excursion strongly suggests that that is their source. Furthermore the labelling is of a distinctive style, and there is no painted locality information, unlike those collected later in his life which were annotated so by his wife. However in the absence of other documentation this inference is uncertain.

Further reading

A separate 'Learning more' article gives a detailed account of Buckland's life.

Gordon, Mrs [E. O.] 1894. *The life and correspondence of William Buckland*, DD, FRS. London.

Torrens, H.S. 1998. Geology in peace time: an English visit to study German mineralogy and geology (and to visit Goethe, Werner and Raumer) in 1816. *Algorismus Heft* 23, 147-175. Münchener Universitätschriften.