



Q&A John Henry

Geological historian

The first geological map of a nation was made 200 years ago by British surveyor William Smith; the rediscovery of a first-edition copy in the archives of the Geological Society of London was announced last month (see go.nature.com/oogpht). As researchers gather for a conference to celebrate the anniversary of the 1815 chart of England and Wales, John Henry, chair of the society's history group, talks about the map and its pioneering creator.

How did William Smith get his start?

He was a very practical man with a weak formal education — he left school when he was 11 years old. You would not have expected him, a boy from a small village in Oxfordshire, to have accomplished what he did. His ability to draw and to observe spurred his uncle to get him books on geometry and surveying. Eventually Smith was apprenticed to a surveyor, and he was off on his first assignment at just 22.

How did he develop his geological ideas?

He began to work in Somerset, surveying the routes for a canal to carry coal to market. Going down mine shafts to study the thickness of coal seams and the distances between them, he noticed the different layers of rocks and the fossils they held. He saw that fossils that looked broadly similar were actually slightly different, depending on which rock strata they were in. In his memoirs, he recalled that he was trying to make a three-dimensional model of the landscape. He worked out that particular fossils are found in particular rocks, and that the rocks are always in the same sequence. Nobody else had picked up on that.

Why was this significant?

There was no precedent for his concept of geology. Before Smith, people mapped rock by layers and not by fossil content. Smith's approach showed him where he was. Was he below coal? Was he above coal? There were times when he said to landowners not to waste their time drilling in a certain place, because there was no coal. This had a huge economic impact, and remains the fundamental concept underpinning modern prospecting, and the oil industry in particular. Scientifically, Smith's work formed the basis for everyone who came after him. He is the father of English geology.

William Smith Meeting 2015: 200 Years of Smith's Map
23–24 April
Burlington House,
London.



William 'Strata' Smith's 1815 map charted the rocks around part of Britain.

What was the wider context for Smith's work?

In the early nineteenth century, there was no systematic mapping of the whole country. Smith was carrying so much in his head, and fleshing it out as he travelled. In his busiest period of consultancy, he covered perhaps 16,000 kilometres, on horseback, walking and in carriages.

How was his map received by colleagues?

The Geological Society started out as a gentlemen's club. Smith was not part of that; he was rural working class. But the aristocrats who employed him could see that he got results in terms of draining land, stabilizing slopes and holding back the sea. So he had a lot of powerful friends, including the naturalist and Royal Society

president Joseph Banks, who supported him.

The Geological Society's 1820 geological map resembles Smith's. Did it plagiarize his work?

It muddies the water. It was a team effort coordinated and compiled by geologist George Greenough. He certainly got a head start by having a look at Smith's map, and that was always Greenough's argument: it is the same underlying geology we're mapping, so of course it looks the same. No one really believed him, yet it was not until 1865 that the society took Greenough's name off that map and acknowledged Smith as a major source.

What happened to Smith after his map was published?

He had managed his finances badly and had a financial failure almost as soon as his map came out in 1815. He had to sell his fossil collection and let go of his London and Somerset properties, and he briefly spent time in debtor's prison. But there was a turnaround by 1831. The Geological Society gave him its Wollaston Medal. Smith was pleased to be recognized, and his fortunes began to recover. He spent the last two decades of his life in Yorkshire, and

it was a very sunny period for him: clearly he had become a grand old man of geology. His nephew John Phillips went on to be a great geologist, a professor of geology at the University of Oxford and a driving force behind the Oxford University Museum of Natural History.

Why is Smith's map still so important today?

It is all part of building blocks. Smith got the concept right, and other people came along and built on that. Later mappers were able to carry the concept through to more difficult terrains with a more complex history of folding and faulting, as in Scotland. But everything starts with him. ■

INTERVIEW BY ALEXANDRA WITZE