

Anniversaries

Geological map published 170 years ago



ANDREW GEDDES BAIN (1797–1864) –

THE FIRST GEOLOGICAL MAP OF SOUTH AFRICA (1856)

John S. Compton (SOUTH AFRICA)

The first comprehensive geological map of South Africa was published by the Geological Society of London in 1856, 170 years ago. The map represented a major advance in the understanding of South African geology and was put together in 1852 by Andrew Geddes Bain (1797–1864: Fig. 1), in consultation with William Guybon Atherstone (1814–1898). Bain, a road engineer, and Atherstone, a medical doctor, were keen, self-taught amateur geologists, heavily influenced by Charles Lyell's *Principles of Geology* (1830–1833). As Bain recalled, he read it *‘with avidity over and over again. I was smitten. Lyell had made a convert of me. I lamented that I had never read his or any other geological work before ... My zeal knew no bounds, and I literally left no stone unturned in search of fossils or minerals. I used to ride about with a large hammer slung in my belt, and a bag on my shoulder, which conduct some charitable friends were kind enough to attribute to lunacy, when in truth it was nothing but a severe attack of lithomania’* (Bain 1896: 59-60).



Figure 1. Andrew Geddes Bain (1797–1864).
Source: Wikimedia commons.

Bain, orphaned soon after he was born near Edinburgh, came to Cape Town in 1816 with his uncle, a soldier. He joined Andrew Smith's expedition to Botswana in 1834 and was trained as a surveyor of military roads under the Corps of Royal Engineers in 1836. He was appointed engineering inspector by the Cape Roads Board in 1845, overseeing the construction of major mountain passes, including Michell's Pass, completed in 1848, and

Bain's Kloof Pass, completed in 1853. A keen observer, with a talent for writing, he was outspoken and had a good sense of humour. In collaboration with the civil commissioner of Fort Beaufort, Mr M. Borchers (1809-1850), a fellow 'lithomaniac', he discovered some of the first fossils of Therapsids (mammal-like reptiles), such as what he called the Blinkwater monster (*Pareiasaurus serridens*). These fossils made the Karoo a famous fossil locality for its record of the transition from reptiles to mammals, a major evolutionary event in the history of life on Earth. Atherstone soon joined up with Bain and Borchers and their 'Cape Iguanodon' was the first dinosaur fossil discovered in South Africa in 1845; however, it was only classified as a plant-eating stegosaur (*Paranthodon africanus*) by Robert Broom (1866-1951) in 1909.

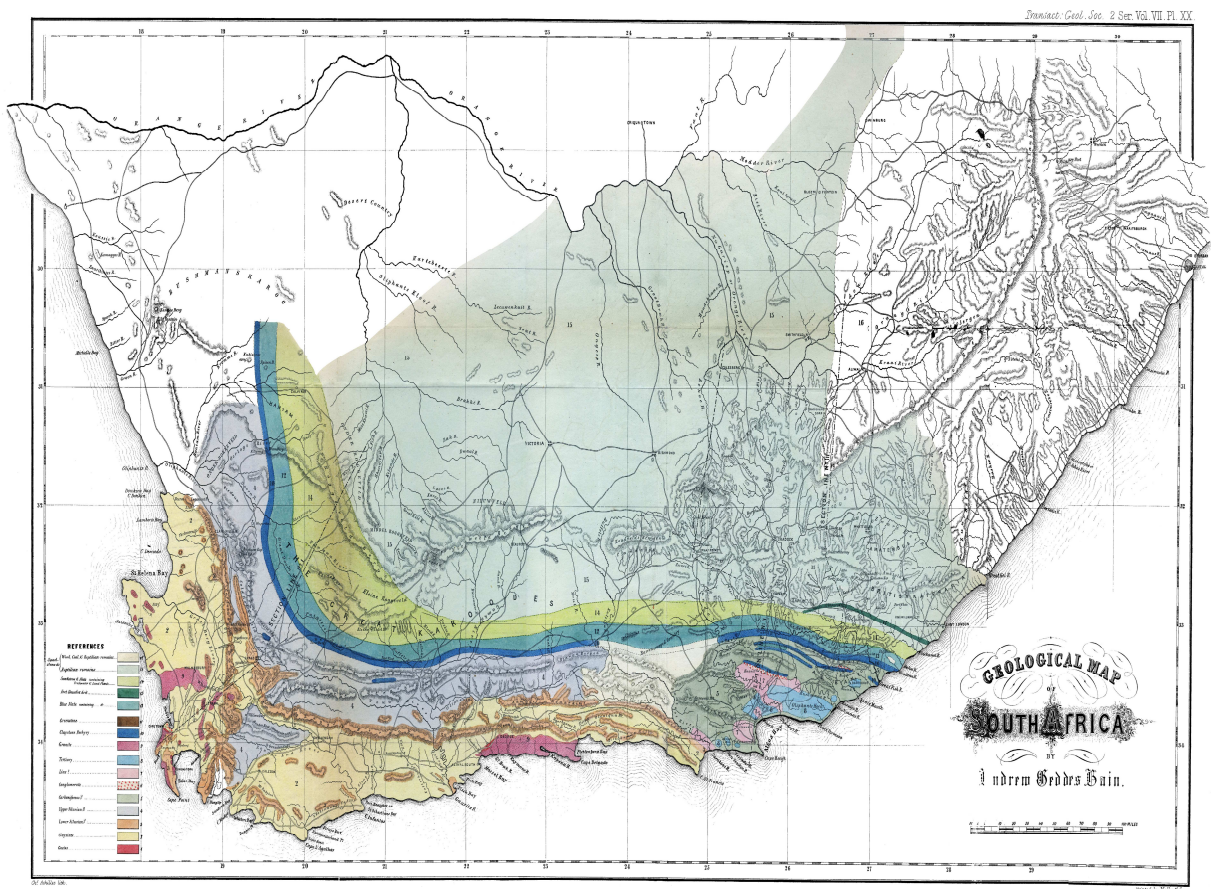


Figure 2. Bain's geological map of South Africa (Bain, 1856).

Bain travelled widely throughout the Eastern and Western Cape provinces over a long and active career as a road builder and had developed a thorough and hands-on knowledge of the rocks. By 1852, Bain was able to construct the first comprehensive geological map of South Africa applying the relative ages indicated by fossils, and in consultation with Atherstone. His map, published by the Geological Society of London in 1856, showed the extent of the Cape and Karoo supergroups, as well as the major mountain belt, the Cape Fold Belt (Fig. 2). Although Bain did not venture too far into theorising, he was struck by the immensity and undeformed nature of the Karoo deposits, especially in comparison to the highly deformed rocks along the coastal areas and Cape Fold Belt. He was equally astounded

by the amount of erosion and the forces that uplifted the extensive inland Karoo highlands referred to today as the Southern African Plateau (Fig. 3):

Bain's favouring a slow, gradual uplift likely reflects the influence of Lyell. It turns out that the Southern African Plateau is even more extensive than Bain knew and its origin is still debated.

Figure 3. Bain's geological cross sections (Bain, 1856).

wholly educated himself for the task’ (Geological Society of London, Editorial commentary on "On the Geology of Southern Africa" by A. G. Bain (1856), *Transactions of the Geological Society of London*, 7(2), 175–232).

Late in life, Bain reflected on his success:

‘I now particularly wish to impress upon my readers that in my case they may see an exemplified successful pursuit of knowledge under difficulties, for I was 40 years of age before I ever read a book on Geology or attempted the study of that difficult science, yet by dint of perseverance and some assiduity, without the aid of any tutor but my own observation, I have attained a position at least among South African Geologists, which gives me proud gratification. And to anyone who may happen to have a taste to pursue the study of that beautiful science geology, and may think there is anything worthy of imitation in my uphill case, I can only say, “Go and do thou likewise.” For there will be found a rich varied and extensive field for the exercise of your talent, teeming with objects of the greatest interest, curiosity and wonder, the careful description and classification of which may not only gain, with the blessing of God the applause and esteem of your contemporaries, but may hand your name to prosperity as benefactors of your race and down honors to your country.’ (Bain 1896, p. 74-75)

His fellow ‘lithomaniac’ Atherstone was also a successful amateur geologist, being the first to identify a diamond in South Africa in 1867, the 21-carat Hopetown, later known as the ‘Eureka’ stone. Many remained sceptical until the discovery of the 83-carat Star of South Africa diamond in 1869, also in Hopetown, which set off the diamond rush. Atherstone was later directly involved in the discovery of the Kimberley diamond mine and was one of the founders of the Geological Society of South Africa in 1895.

Bain was transferred to the Eastern Cape in about 1855, where he remained active as a committee member of the Albany Public Library and was a Justice of the Peace. He gave lectures on geology and arranged the fossils of the Albany Museum. In 1863, heart problems forced him to take leave of his most ambitious project, building the Katberg Pass that extended for 50 km over the Winterberg between Queenstown and Fort Beaufort. He died in Cape Town on 20 October 1864, after returning from a visit to Britain in April 1864, where he was well received by leading geologists and palaeontologists. His son, Thomas Bain (1830-1893), succeeded his father as a distinguished road engineer in the Western Cape.

Further Reading

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