



Geological exploration

The New Zealand Geological Survey, 1865–1892

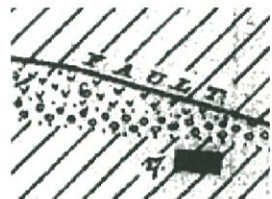
By 1865 there was a move to undertake a national geological survey, mostly so that central government could maintain control over discoveries of gold and coal. James Hector from Otago was approached for advice. Rather than simply reporting on mineral prospects, he proposed an organisation based on a museum that would study the natural sciences in New Zealand. As this was a much more ambitious project, it is surprising that it was accepted with little debate. It also started a national tradition of geology being regarded as a science, rather than part of mining as in many other countries.



Colonial Museum staff

Hector's surveys, 1865–92

Hector was appointed director of the New Zealand Geological Survey and Colonial Museum in March 1865, at a salary of £800 per year. Over the next 25 years he and his staff explored most parts of New Zealand, and their reports were published in the annual *Reports of Geological Exploration*.



Early Geological Survey map

Doing double duty

To survey the entire country, James Hector was able to employ a clerk, a draftsman, a chemist and a messenger – but no field staff. When Hector was out in the field all office work stopped, and when he was in the office the geological survey was suspended. Assistant geologists were later appointed.



The Hope Fault

Although Hector had prepared a geological map of the whole country in 1865, it was based on scanty information, and many large areas were unexplored. He sent his staff to examine places of economic or scientific importance, and gradually pieced together the geological jigsaw of New Zealand.



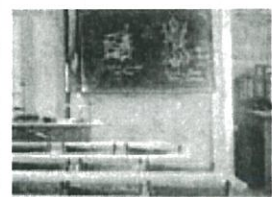
Otago School of Mines

The top priority was to assist economic development. The public cry was 'Find gold, find coal'. The first reports were mostly about mineral deposits, including the Thames goldfield, Taranaki oil seeps, and the Waikato coalfields.

Alexander McKay

All Hector's assistants made important contributions, but the long-serving Scottish-born geologist Alexander McKay stands out because of the perceptiveness and reliability of his reports.

Being largely self-taught, McKay had not been biased by European concepts, and developed interpretations from his own observations. A major advance was his recognition that New Zealand mountains were not ancient, but had been uplifted in comparatively recent times (the



Coromandel School of Mines

last 10 million years), and were continuing to rise. He also deduced that there was a close relationship between earthquakes and faulting. He was possibly the first person in the world to recognise horizontal offsetting on a major fault.

Boxed fossils

Geologist Alexander McKay was employed to collect fossils, in order to date the rocks in different parts of the country. He made large collections, some of which have not been bettered. But they were not identified at the time and remained packed up in boxes for many years. They form the core of the national fossil collection, held at GNS Science.



Geology at Waitaki Boys High School

Study and training

Because of the interest in gold and other minerals, geology was one of the first university subjects taught in New Zealand – at Canterbury and Otago by the late 1870s, followed by Auckland in 1883. In 1878 the Otago School of Mines offered university-level education for mining engineers. A network of mining schools gave practical training for people working in the mines.

Decline of the early geological survey

During the long depression of the 1880s Hector was able to resist financial cutbacks, but the Liberal government elected in 1891 was unsympathetic. In 1892 McKay was transferred to the Mines Department and the Geological Survey received no finance. Hector remained as director of the Colonial Museum, but responsibility for geology and mining was taken away from him.

Achievements

Between 1865 and 1892 Hector's survey reported on the country's major geological features and mineral deposits. Although small, New Zealand has an almost complete record of rocks from the Cambrian Period (about 540 million years ago) to the present day. By 1892 the complexity had been recognised, but many problems remained unresolved. The survey produced few detailed investigations and only rudimentary maps.

Biographies



Charles Douglas, 1840–1916



Fredrick Wollaston Hutton, 1836–1905



Alexander McKay, 1841–1917



James Park, 1857–1946



William Skey, 1835–1900



George Henry Frederick Ulrich, 1830-1900

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