

GEOLOGY

Bedrock of China

Xu Xing applauds a study tracing the links between Chinese nationalism and geology.

Chinese science has long been tightly entangled with nationalism. An illuminating case study is the development of geology during the Republican era (1911–49). This followed an unusual pattern, striking a balance between the interests of science, the nationalist movement, the state and scientists in difficult, unstable circumstances. Science historian Grace Yen Shen chronicles the field's evolution in *Unearthing the Nation*.

Shen begins with an account of foreign exploration in Chinese territory from the mid-nineteenth to the early twentieth centuries, such as US geologist Raphael Pumpelly's investigations of the coalfields near the Yangtze River in the 1860s, and German geologist Ferdinand von Richthofen's field trips across China not long after. Richthofen went on to publish milestone works such as the five-volume *China: The Results of My Travels and the Studies Based Thereon* (1877–1912). In the early twentieth century, Chinese researchers, including the German-trained Gu Lang and Zhou Shuren, published on geology themselves.

Zhou (who under his pen name Lu Xun is a giant of Chinese fiction) was the first Chinese person to write on the field, in *Brief Outline of Chinese Geology* (1903). But as Shen notes, it was the investigations of Zhang Hongzhao, Ding Wenjiang, Weng Wenhao, Li Siguang and others around this time that marked the first stirrings of a homegrown discipline. Weng became the first Chinese geologist to earn a doctorate, after investigating the

igneous formations of Belgium for his thesis at the University of Louvain. These pioneers, Shen says, saw fieldwork as helping China to “understand its own territory”: science thus became a means of nation-building.

Yet for years, Chinese geology remained internationally collaborative in terms of practitioners, fieldwork, institutions and publications. In the 1920s, China was primarily agrarian and lacked the financial and intellectual resources to cultivate science. The Geological Society of China (GSC), established in 1922, was the first scientific association initiated by Chinese investigators. It listed among the 78 members in its first year 23 foreigners — including Swedish geologist Johan Gunnar Andersson, who contributed to the discovery of the Peking Man *Homo erectus* fossils. The *Bulletin of the Geological Society of China*, launched in 1922 and one of the first technical journals dedicated to Chinese geology, was published mainly in Western languages, including English. US geologist Amadeus Grabau (1870–1946), who spent most of his academic life in China, made huge contributions to Chinese palaeontology and stratigraphy, and the New York-based Rockefeller Foundation sponsored organizations such as the Cenozoic Research Laboratory in Beijing, established in 1928 to investigate the Peking Man fossils.

Unearthing the Nation: Modern Geology and Nationalism in Republican China

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Chinese geologists persisted in fostering an independent discipline, even in 1927–37, when frequent conflicts flared between the government in Nanjing and local warlords, and within the ruling party. Weng and others recognized that their field could help to satisfy practical needs of the state such as the search for fossil fuels, and could build national pride. A platform came in 1936 with the GSC's Chinese-language journal *Dizhi Lunping* (*Geological Review*). And the Second Sino-Japanese War of 1937–45 was a watershed: the drive to find natural resources for the war effort led to achievements such as the discovery of China's first oil fields. Towards the end of the Republican era, a truly Chinese geological community had come together.

Shen's chronicle reveals a broader trend in Chinese science. In the 1930s, Weng and several other foundational Chinese geologists became high-level government officials. The desire of Chinese intellectuals to build a great nation has often led outstanding researchers into administration and politics, a tradition reflected in the saying ‘*Xue er you ze shi*’ (Officialdom is the natural destination for good scholars). The trend persists; in the long run I feel that it will harm Chinese science.

Unearthing the Nation is more than a scientific history. Shen's in-depth analysis reveals that national, political and cultural loyalties had a key role in the development of Chinese geology, and she seamlessly integrates this into her narrative on the discoveries and evolution of the field. Shen includes Chinese characters in the text, which makes the book more congenial for those who can read Chinese, and adds colour for those who cannot.

I would have loved to see more information on specific scientific discoveries, and Shen's tendency to focus on a limited number of key geologists and organizations sometimes obscures the larger picture. Nevertheless, this is an important book: it presents a comprehensive history of Chinese geology while demonstrating the discipline's unique pattern of development. Implicit in it is the significance of openness to international community, even in the development of a national scientific discipline. ■

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Chinese geology students on a field trip in about 1950.