Initiation Period (1914–1934): Geologists' Artistic Accomplishment Reflected by Hand-Drawn Maps

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In 1903, Zhou Shuren (pseudonym is Lu Xun) said in his *Geological Theory of China*: “Observe the national conditions is not a difficult task. There is no home-made precise geological map in its territory and its city of a non-civilized country.” In 1906, the *Complete Map of China's Mineral Resources* compiled by Gu Lang and Zhou Shuren is the earliest geological map in China.

From 1913 to 1919, Zhang Hongzhao, Ding Wenjiang, and Weng Wenhao, the founders of China's geological cause, led the teachers and students of China Geological Survey to carry out geological and mineral survey and mapping work in Beijing Xishan, Hebei Province, Shangdong Province and other places. They successively compiled geological maps of various scales, such as the *Geological Map of Xishan, Beijing*. In the 1920s, three 1:1 million geological maps were compiled and published: *1:1 million China Geological Map and Instructions (Beijing-Jinan Sheet)*, *1:1 million China Geological Map and Instructions (Taiyuan-Yulin Sheet)*, and *1:1 million China Geological Map and Instructions (Nanjing-Kaifeng Sheet)*. In the initial stage, geological predecessors compiled many representative geological maps of great significance, which laid the first foundation for future geological mapping in China.

At this stage, geological maps are almost hand-painted, with relatively simple lines, and mostly monochrome; polychromatic maps were painted mainly with watercolor pigments, and the used paper was light and rough. There is no standard for geological mapping, and the scale is mostly a written description, many of which are bilingual, in Chinese

and English. Most of the maps are regional and mineral geological maps. Hand-drawn geological map reflects the personal artistic accomplishment of the geological predecessors.

Representing one of the earliest regional geological maps collected by the National Geological Archives of China (NGAC), this sketch depicts geological conditions in the vicinity of Mt. Dongting. The sketch's lines are distinct, and its gouache colors elegant. The paper is thin. The content of the sketch is simple, with legends and scale but no compass rose. The text that accompanies the map was written by Chinese writing brush (Fig. 2.1).

In 1914, Ding et al. traveled to Yunnan, Guizhou, and Sichuan provinces and other destinations to conduct geological surveys. During the expedition, they compiled several geological maps and profiles as well as geological maps of mining areas in Guangxi and Shandong provinces, pioneering the development of geological mapping through field surveys in China (Figs. 2.2, 2.3, 2.4 and 2.5).

This geological map of an iron ore deposit was drawn by prominent Chinese geologist Hongzhao Zhang on thin, light paper with colors in gouache. The content of the map is simple, the lines are distinct, and its colors are vivid. A legend, scale, and compass rose are included (Fig. 2.6).

These sketches depict ancient creatures in natural light using dark lines and rich textures (Fig. 2.7).

The histograms were drawn by Weng Wenhao, one of the earliest modern Chinese geologists. The drawings are elegant, precise, and detail-oriented. The yellowed paper possesses old-fashioned charm (Fig. 2.8).

Details are properly portrayed with smooth lines. Large areas of blank space and rolling hills highlight the map's theme. The steadily rising gentle terrain on the left of the map recalls the mystical atmosphere of a scroll painting of rivers and mountains. The sophisticated narrative technique makes the viewer feel as though a complex story has suddenly broken off, filling the plain picture with rhythmic tension. Rather than a geological profile, the map is more like a painting of a long expanse of rivers and mountains (Fig. 2.9).

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Fig. 2.1 Geological sketch map of Mt. Dongting, Wuxian County, Jiangsu Province [1]

This is the first geological map on a 1:100,000 scale that was independently surveyed and mapped by Chinese geologists. It was published in 1920 as the first supplementary issue of “Geological Special Report,” the first regional geological monograph written by Chinese geological scientists (Fig. 2.12).

This is the first geological map of a large region with standard sheet division (1:1,000,000) compiled by Chinese geologists. One of the three small-scale geological maps with standard sheet division, it was completed under the supervision of Wenhao Weng, the acting director of the China Geological Survey during 1921–1924, and of substantial strategic significance (collection of the National Geological Library of China) (Fig. 2.13).

In this map, the contours, strata, and rock properties of a terrain in Anhui Province are depicted using single red lines. The lines are dense in the right part of the map but sparse in the left part and show the effect of relative concentration and partial sparseness, which generate an appealing contrast (Fig. 2.14).

This map depicts the distribution of lead, copper, gold, asbestos, sulfur, and pyrite in Xikang District (now the Yajiang area of Sichuan Province). The map is mainly drawn with delicate and smooth lines, which are mainly green contour lines, partially supplemented by red lines and blocks in blue, yellow, red, etc., with a neat and forceful calligraphy of regular script in small characters. These characteristics combine to lend the map an antique allure (Fig. 2.15).

The lines on the maps are elegant, smooth, precise, and clean, and the colors are bright and distinct. The frames of the maps are uncluttered (Fig. 2.16).

This schematic diagram of the production method of a potter’s wheel is rendered concisely with adequate detail. The simple light effects and indicators on the drawing make the production process easily understood (Fig. 2.17).

This map is based on geological surveys by Li Siguang and exquisitely drawn in harmonious colors (Fig. 2.18).

This sketch depicts the distribution of outcrops of copper and the formation of rock strata in Daye, Hubei Province (Fig. 2.19).

Fig. 2.2 Geological map of eastern Yunnan [2]. (Source: China's first field geological map)

Fig. 2.3 Generalized section through eastern Yunnan by V.K. Ting [3]. (Source: China's first field geological map)

Fig. 2.4 Geological map of Dachang, Guangxi Province [4]. (Source: China's first field geological map)

Fig. 2.5 Geological map of coalfield of Yixian, Shandong Province [5]. (Source: China's first field geological map)

Fig. 2.6 Geological map of iron ore deposit in Xibei Township, Fanchang County [6]

Fig. 2.7 Sketches of ancient creature's fossils [7]

Fig. 2.8 Histograms attached to report on Boyangjian mine, Leping County, Jiangxi Province [8]

Fig. 2.9 Geology and mineral deposits map of Mt. Huitou (Part II) [9]

Fig. 2.10 Geological map of Fengjiang coal mine in Yugan County, Jiangxi Province [10]

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GEOLOGICAL MAP OF THE TZŪ CHUAN AND PO SHAN COAL-FIELD, SHANTUNG.

Fig. 2.11 Geological map of Boshan coalfield in Zichuan County, Shandong Province [11]

Fig. 2.12 Geological map of Mt. Xishan, Beijing [12]

Fig. 2.14 Coalfield geological map of Shuidong Township, Xuancheng County, Anhui Province [14]

Fig. 2.15 Geological mineral map of eastern part of Xikang District [15]

Fig. 2.16 Two geological maps of Danba, Taining, and Zhanhua Counties, Xikang District [16]

Fig. 2.17 Production method of potter's wheel [17]

Fig. 2.18 Geological map of Longtan [18]

Fig. 2.19 Geological sketch of Yangxin copper mine, Daye, Hubei Province [19]

Fig. 2.20 Geological profile of the area from the northwest of Mt. Wuyin to Yansi, Longquan County [20]

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