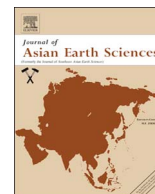




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Full length article

# Liu Tungsheng: A geologist from a traditional Chinese cultural background who became an international star of science

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## ABSTRACT

Liu Tungsheng (1917–2008) resumed his scientific career and became actively involved on the international stage in the field of Quaternary Sciences after 1982, at the age of 65, following Deng Xiaoping's 'Reform and Open Up' policy, after his first international publication of China loess research published in 1950s. Though his best known contribution to Quaternary research is his pioneering study of the extensive loess deposits of China, several other important scientific contributions are less widely known, as they were published in Chinese. By studying about 400 well-preserved fieldwork notebooks left by Liu Tungsheng, as well as many biographical and personal photographic collections, we have mapped his remarkable life during his 91-year journey and the contributions to geoscience. From a historical point of view, Liu Tungsheng created a unique chapter in the history of modern geological science in China in his role as a geologist emerging from a traditional Chinese cultural background who became a star on the international scientific stage.

## 1. Introduction

It is an interesting coincidence that, in 1917, the first specifically scientific institution in China was established by three co-founders of the China Geological Survey (CGS) who had returned to China from overseas, where they had been studying Geology. These three scholars were called V.K. Ting (who graduated in 1911 from Glasgow University in the United Kingdom), W.C. Wong (who got a doctorate from the Catholic University of Leuven, Belgium) and H.T. Chang (who graduated from the Imperial University of Tokyo in Japan). That same year, on 22nd November 1917, Liu Tungsheng was born in Shenyang, Liaoning Province, northeastern China. He was later to join the CGS in 1945 as a junior geologist. From very limited financial beginnings, and only a small number of staffs, the CGS soon developed into a world class research institute until 1949, when the newly formed government closed it and dispersed its almost one hundred geologists to other units throughout China. He was able to make a special contribution to the development of earth sciences in China over the last century. Besides his publications, little was known about his education and scientific philosophy, let alone his family background and personal history. In a rare interview between two academic friends from two different countries, James Bowler (from Australia) and Liu Tungsheng, two great masters of science, conducted an intensive dialog about Quaternary Science, and its past, present and future prospects (Bowler, 2009). In this interview, Liu Tungsheng talked for the first time, in English, about

his personal journey, something he had never done in Chinese. Indeed, such thoughts had not been included in his official biography, published in China. During the course of this conversation, he talked about the single-mindedness with which he had pursued during the development of science in his native country. Taking this interview as our starting point, we have also had the privilege of studying approximately four hundred of his well-preserved fieldwork notebooks in addition to his numerous biographical tributes, correspondences and personal collections of photographs. A large proportion of the most eminent Chinese scientists have been educated in either Europe or the United States of America, but Liu Tungsheng was trained and worked purely in China. From a historical point of view, Liu Tungsheng created a unique chapter in the history of modern geological science in China as a geologist who had emerged from within the bounds of traditional Chinese culture to become a scion of the international scientific scene. In this paper we have focused on Liu Tungsheng's personal development as a Chinese geologist; other authors who have contributed to this special centennial issue dedicated to Professor Liu have explored his vast scientific legacy, his insight and the inspiration he brought to loess research in China and beyond, as well as his prescient philosophical appreciation of the importance of climate change and environmental sustainability.

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**Fig. 1.** Liu Tungsheng sitting in the middle of the front row, aged 7; his younger sister and brother and his parents are in the center and on the right in this photograph, and an uncle and aunt are on the left. The photograph was taken in 1924 in Shenyang, northeastern China.

## 2. Liu Tungsheng's childhood and the Japanese occupation of northern China

Liu Tungsheng was born on November 22nd, 1917, in the small town of Huanggutun, a suburb of Shenyang City (formerly known by its Manchu name of Mukden) which was the capital of the Manchurian region of northern China during that time. He was the son of Liu Furui (Fig. 1), who was at that time a railway station master, and Zhao Baizhi, a housewife from a farmer's family from the countryside. Liu Tungsheng was the oldest of four children. An elder cousin was also raised by the family. His father lost his own mother when Liu Tungsheng was only five years old and subsequently worked in the family's small drugstore. As a self-educated man, Liu Furui decided to provide all his children with the very best education as possible as he can. This was an extraordinary ambition at the time, as most of Liu Tungsheng's classmates in primary and secondary school, and university, were either affluent second generation middle class Chinese, or the children of government officials. (*Liu Tungsheng's cousin Liu Guizhi graduated from the School of Nursing of the famous Peking Union Medical College, during the war against the Japanese, she went to Yan'an and joined the Communist Party, later working as a Communist Party secretary in a Beijing hospital. Tungsheng's brother Liu Tunglai graduated from Tsinghua University in forestry and became a senior scientist in the Chinese Academy of Forestry. His younger brother, Liu Tungxing, graduated from Fu Ren Catholic University in Beijing, majoring in Physics; he later became a lecturer at Taiwan's Chengkung University, but, due to the fallout from China's civil war of 1945–1949, he was out of touch for 40 years. Liu Tungsheng's younger sister Liu Guirong also graduated from Fu Ren Catholic University in Beijing in pedagogy, but died young of illness in Beijing in 1944.*)

Liu Tungsheng's life was changed by the Huanggutun Incident, the assassination of the Fengtian warlord Zhang Zuolin on June 4th 1928 by an officer of the Japanese Kwantung Army. It took place at a Japanese-guarded railway bridge near the Huanggutun Railway Station, where Zhang Zuolin's personal train was destroyed by a trackside bomb. It marked the beginning of the Japanese war with China and was followed by the Japanese military invasion and occupation of parts of China from 1928 onwards, until Japan's defeat in 1945. During the Japanese annexation of northern China—"Manchukuo"—the Chinese language was suppressed in an effort to eradicate Chinese national identity in the region. As Liu Tungsheng remembered, "*The Japanese occupied northern China and soon controlled*

*a large part of Chinese territory, not only through their military power, but also through a kind of intellectual and cultural aggression via their propaganda machine. Their management and cultural control were so very strong that we had to learn Japanese, obey Japanese rules and acknowledge the primacy of Japanese social behavior.*" Nonetheless, Liu Tungsheng recounted an idyllic childhood where "*both patriotism and national humiliation filled the air.*"

Besides attending primary school classes, Liu Tungsheng was sent to private lectures on traditional Chinese literature as well as English lessons by his father. This was a very special curricular provision for a child from the countryside almost one hundred years ago, and would represent a very high standard even today in China. Perhaps because his paternal grandfather ran a small drugstore, his father would have preferred Liu Tungsheng to study medicine. The best medical college in the country was also located in Shenyang; it was run by the Japanese, who also ran an affiliated middle school in the region. However, Liu Tungsheng was reluctant to study in a Japanese middle school and refused to live in the Japanese colony. With the support of his father's friends, he left Shenyang for Tianjin, living apart from his family at the tender age of 13. Liu Tungsheng recalled this remarkable childhood: "*One interesting difference, maybe, for me, was that I learned quite a lot about nature when I was very young because we lived in the countryside where there was no entertainment such as going to the movies or theatres. The only thing we enjoyed was nature; at the small river near our home we could swim and catch insects or other small animals.*"

In summary, Liu Tungsheng grew up in a rural part of Shenyang, northern China, a heavily industrialized region rich in mineral resources. Though his childhood was shattered by the Japanese military invasion and subsequent cultural oppression, he received an excellent elementary education combined with traditional Chinese and English studies, and cultivated a keen interest in nature and outdoor activities. Being from a working class family, he learnt and inherited the qualities of diligence, integrity and generosity from his parents.

## 3. Education (1930–1942) at Nankai Middle School and the National Southwestern Associated University

On the recommendation of a friend of his father, Liu Tungsheng traveled to Tianjin at the age of thirteen. When he was there, he took the entrance examination for enrolling at the famous private Nankai Middle School in Tianjin, which had been founded in 1904 by Zhang

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