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LIFE IN CHINA

'A Brick on the Great Wall'

Dialogue

By XU Qingqun

Daniel-Constantin Tomozei has spent 16 years in China writing about the country for Romanian readers. In September 2024, he received the Chinese Government Friendship Award, the nation's highest honor for foreign experts who have made great contributions to international exchanges.

This Romanian-language expert at the China Media Group arrived in Beijing in 2010, at the age of 37, with limited knowledge of the country. He found a society that reminded him of the Romania of his childhood.

Born in Sibiu, the Transylvanian city known as the "City of a Thousand Eyes," Tomozei grew up in a place where cultures had long converged. His early impressions of China came from the Romania-China friendship of the 1970s and 1980s, from colleagues at the Sibiu newspaper Tribuna who had visited in 1997, and from his own interest in collecting stamps, Chinese literature and films.

"I immediately felt a sense of belonging," he recalled. "As if I had come home." The streets were clean, public order was evident, healthcare and education functioned, and human relationships were warm.

Ten books, one mission

Tomozei has devoted the past 16 years to narrowing the distance between China as it is and China as it is imagined abroad. He has traveled extensively across the country and authored ten books on its history, culture, politics, economy, society and diplomacy, including its relations with Russia, the United States, Romania and Moldova.

In 2024, the 75th anniversary of China-Romania diplomatic relations and the 20th anniversary of their comprehensive friendly partnership, he published a book titled *China, A True Friend*. The book profiles dozens of Romanian sinologists and Chinese scholars of Romanian, documents recent achievements in cultural exchange, and presents China's modernization alongside the vision of building a community with a shared future for humanity. Through it, he concludes that "China is truly a friend of the Romanian people."

His measured approach and engaging prose have been widely recognized. At events organized by the Romanian Academy and at his book launches, his works have drawn experts and general readers alike seeking to understand contemporary China.

Tomozei credits China's long-term planning for much of its development speed. Policies are designed with decades in mind and carried forward consistently, he says. He cites the high-speed rail network: When he arrived in 2010, China's first high-speed line was two years old. Today the network stretches past 50,000 kilometers, about 70 percent of the world's total, and trains run at more than 350 km/h.

He is equally attentive to education. "I have had the privilege of visiting and observing how China develops and refines its education system based on its own history and culture," he said, noting the modernization and international exchanges supported by educational institutions, and the excellent conditions on university campuses.

While China's economic achievements are remarkable, Tomozei holds that its most compelling appeal lies in its cultural depth.

An endless textbook

Both of his daughters were born in Beijing and speak fluent Chinese. Chinese culture, he argues, is "an endless textbook" that must be understood from multiple dimensions: past and present, legends and myths, heroes and ordinary people, and the norms and social respect that are continuously advocated.

The Spring Festival, for example, must be examined from a millennial cultural perspective, a social and family perspective, and an economic and developmental perspective, a way of understanding how traditions are inherited and how cultural identity underpins the country's ongoing development.

Having explored both modern cities and villages with deep cultural roots, he counts dumplings as his favorite dish in China. He feels a particular affinity with southern Chinese cuisine, noting its resemblance to Romanian food: air-dried and smoked pork, rice wine, and traditional beverages brewed from plums and apples. For him, these similarities offer a pathway to connection.

Tomozei places his own work in the tradition of an earlier generation of exchange. He traces this commitment to an earlier generation of Romanian sinologists,



Daniel-Constantin Tomozei. (COURTESY PHOTO)

among them Romulus Budura, Romania's ambassador to China in the 1990s, who devoted his life to bilateral relations. He calls them his role models, and says they inspired him to delve deeper into understanding China and to present the real China to the Romanian public.

He calls China one of the few countries in the world that defines and reinvents itself according to its own principles and cultural model: "One must set aside prejudice and half-knowledge, and observe this country with prudence and a genuine willingness to understand."

His website, dantomozei.ro, is taglined "A Brick on the Great Wall," a phrase he uses to describe a small contribution to a large structure. This autumn, he hopes to complete a new volume portraying the transformation of Chinese society under the leadership of the Communist Party of China, linking his firsthand experience to the country's millennia-old culture and traditions.

This article was edited and translated by LONG Yun based on the Chinese version.

Tech+Culture

Technology Resurrects Imperial Tribute Bricks

By CHEN Xi & BI Weizi

There is a folk saying, "Beijing's city, Linqing's bricks," highlighting the special status of Linqing tribute bricks in building Beijing's iconic architecture. These grey bricks, made in kilns in the city of Linqing in Shandong province, east China, were used in the imperial architecture of the Ming (1368-1644) and Qing (1644-1911) dynasties. Grand structures such as the "Forbidden City" — known as the Palace Museum today — and the Temple of Heaven in Beijing were built with these bricks, renowned for producing a resonant sound when struck, and displaying a dense, pore-free cross-section when broken.

However, with the decline of the canal transport system, production of the bricks ceased in the late Qing Dynasty, and this traditional craft was on the verge of being lost.

But since 2016, with the support of the National Natural Science Foundation of China, teams led by Professor Zhang Long and Professor Hou Feng from Tianjin University (TJU) in north China, have collaborated with intangible cultural heritage inheritor Zhao Qing'an, to revitalize this ancient craft through modern technology.

Their first step was to create a systematic scientific archive for the Linqing tribute bricks. Fieldwork, oral history interviews and archival research clarified the production management systems and distribution channels for the imperial bricks. Then they compiled the data from the inscriptions on the bricks and identified 440 kiln operators and 232 artisans and foremen, establishing a lineage of the craftspeople involved.

The team developed a technical framework combining in-situ testing with laboratory analysis to create a "genetic profile" — characterized by elemental composition and mineral phases — to trace the bricks' origins. "Grey bricks from different locations possess unique geochemical fingerprints," Zhang said. "Like DNA, these help us to scientifically determine their source."

The "soul" of the Linqing tribute bricks lies in the local high-quality "lotus soil." However, that has become increasingly scarce due to land conservation policies. Zhao sourced clay from river dredging operations, but the material's composition varied significantly, making it difficult to consistently

replicate the quality of ancient bricks based on experience alone.

To address this, the team analyzed high-quality ancient bricks to reverse-engineer their firing temperatures and raw material compositions. Extensive experiments on mixing ratios and firing processes uncovered the links between soil composition, firing temperature and the resulting brick properties. Hou said, "We helped the inheritors transform their indescribable experience into quantifiable, replicable scientific parameters."

The team was able to develop various formulas that ensured that the bricks made from alternative soil sources matched the standards of the traditional imperial tribute bricks.

For the firing process, they collaborated with the School of Earth System Science of TJU to utilize isotope geochemical tracing methods. They established a database of material characteristics and a method for tracing the bricks' origin, establishing scientific criteria for identifying suitable brick materials for the restoration of ancient architecture.

Today, the modern "Linqing tribute bricks" have become the preferred choice for restoration projects at cultural heritage sites. The Tribute Brick Cultural Industry Park, established by Zhao in Linqing, has been designated as a base for grey brick materials used in historic architecture in Beijing. While ensuring a steady supply of materials for heritage restoration, the park has created jobs for over a hundred villagers, turning this intangible cultural heritage into a new engine for rural revitalization.

From experience-based inheritance to scientific understanding, and from verging on extinction to rekindled kiln fires — this cross-disciplinary collaboration between technology and craftsmanship has ensured that the six-century-old tradition grows stronger in the new era.



A picture of Hall of Supreme Harmony (Taihe Dian) in the Forbidden City in Beijing. (PHOTO: VCG)

'Obesity Memory' Makes Losing Weight so Tough

Science Outreach

By Staff Reporters

One-eighth of the global population struggles with obesity. Yet, for many, losing weight proves incredibly difficult. New research on mice offers a crucial clue: Immune cells known as "adipose tissue macrophages" harbor an "obesity memory," acting as the hidden culprit.

These macrophages are vital components of the immune system. Within adipose tissue, they act as "cleaners," clearing away dying cells and

maintaining tissue health. Scientists induced obesity in mice by feeding them a high-fat diet for 12 weeks and then switching them to a low-fat diet for six weeks to observe weight loss. They found that the mice that lost the least weight had significantly lower levels of a protein called CWC22 in their macrophage nuclei.

To confirm the significance of CWC22, the researchers genetically modified a group of mice, disabling the CWC22 gene. These mice struggled to shed fat during weight-loss efforts. Without CWC22, macrophages could not effectively clear dead cells, resulting in an accumulation of apoptotic cells in the adipose tissue.

Further analysis revealed that

CWC22 acts as an intracellular "text editor" that is responsible for correctly splicing and editing certain genes. The absence of CWC22 caused splicing errors in the key gene *Scarb1*, which effectively broke the macrophages' "garbage trucks" (scavenger receptors) before they could reach the cell surface. This rendered the receptors unable to function properly.

The inability of these "cleaners" to function also led to a reduction in the chemical substance inosine. Inosine typically signals fat cells to break down stored fat. With reduced levels of inosine, however, this signal could not be transmitted effectively, making weight loss more difficult.

Even after weight loss, 51.9 percent

of the genes in these macrophages retained abnormal splicing patterns associated with obesity. This suggests that the macrophages tenaciously "remember" the previous obese state, an "obesity memory" which severely impairs their normal cleaning functions.

The good news is that this "obesity memory" is reversible. When scientists used a synthetic "gene patch" to correct a *Scarb1* gene splicing error, the macrophages' "garbage collection" function was restored, inosine levels increased, and the mice lost weight. Comparisons of tissue samples from lean and obese individuals also revealed that CWC22 is abundant in the nuclei of immune cells in lean people, yet scarce in those of obese individuals.

Perhaps in the near future, we will be able to reverse these "obesity memories," making the weight loss journey far less arduous.

'Big Windmill': World's Earliest Vertical-axis, Multi-sail Wind-powered Machine

Traditional Eastern Wisdom

By BI Weizi

Over 2,000 years ago, horizontal-axis winnowing fans were being used in China to separate grain from chaff. These agricultural tools, operated by hand or foot, rotated fan blades to generate airflow and separate grain from husks. They are the world's earliest centrifugal grain-winnowing machines. Introduced in Europe in the 18th century, these fans revolutionized Western grain processing and laid the foundation for modern blowers.

The "Big Windmill" specifically refers to the practical, vertical-axis, sail-equipped windmill that emerged during the Southern Song Dynasty (1127-1279).

Historical records indicate that it was used to drive waterwheels for irrigation. This indigenous Chinese invention predated European horizontal-axis windmills by centuries. Unlike the simple vertical-axis windmills of Persia or the horizontal-axis windmills of the Netherlands, this design employed a balanced Chinese junk-sail structure, making it a unique drag-type vertical-axis wind machine.

The windmill's main body consisted of an octagonal-prism frame made of solid wood with a central vertical drive shaft. Eight masts extended outward to suspend the sails, and the base of the main shaft was connected to a "dragon-bone" waterwheel via a gear mechanism (a type of chain pump).

The windmill's core innovation was its adaptive sail mechanism. The sails were mounted off-center and restrained

by ropes. The sails on the downwind side automatically opened to face the wind perpendicularly, maximizing force capture. The sails on the upwind side automatically pivoted to align parallelly with the wind, minimizing drag. This enabled continuous rotation in the same direction, regardless of the wind's angle, without the need to rotate the entire machine, offering a significant advantage over the rotating-turret structures of European windmills.

Since ancient times, large windmills have primarily been used for farmland irrigation and drainage. Widely used in water-rich regions such as northern Jiangsu and the Jiangnan area, they allowed the continuous diversion of river water into rice paddies, eliminating the need for human or animal labor. During flood seasons, they quickly drained accumulated water from low-

lying areas, freeing up significant agricultural manpower.

These windmills were also used to pump brine for sea salt production. Large-scale deployments were found in the Changlu and northern Jiangsu salt fields, where the windmills pumped saline groundwater for solar evaporation.

These windmills represent the world's earliest mature vertical-axis water-lifting windmills, capable of operating in winds from any direction. They integrated ancient shipbuilding, sail and gear mechanics technology, as well as hydraulic engineering. This combination of technologies embodies ingenious adaptation of engineering solutions to local conditions. Furthermore, their self-adjusting sail design offers a traditional technological reference for modern vertical-axis wind power generation equipment.

World's Longest-span Steel Arch Bridge Rises with Digital Tech

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"A single truss segment is 18 meters high, 39.5 meters long, and weighs 425 tonnes. We control bolt hole reconstruction within one millimeter and overall segment accuracy within two millimeters," said Zhou Yin, deputy director of the university's large-span arch bridge intelligent construction institute. Unlike ordinary building information modeling, this is a "force-form coupled" dynamic simulation that calculates deformation during assembly.

The team also developed "N+1 pre-assembly control technology," locking errors into the manufacturing stage. This cut pre-assembly time by 25 percent and raised full-arch alignment from centimeter to millimeter precision.

A dynamic 'brain' for high-altitude assembly

The third challenge: cantilever assembling 10,000 tonnes of steel at 310 meters high, amid gorge winds and 20-centimeter temperature deformation between day and night.

"The steel arch expands tens of centimeters in the sun and contracts at night," Huang said. "With a fully bolted structure, a one-millimeter deviation in

the first segment could lead to centimeter-level errors later."

The team deployed an "original shape reset installation control method" and a "digital twin control platform." The reset method gives each suspended segment a 3D millimeter-level target, so it fits "right the first time." The twin platform captures every deformation in real time and predicts invisible internal forces, ensuring adjustments when the sun or wind is present.

The system improved high-altitude alignment efficiency by 50 percent. "The pass rate for high-strength bolts and first-time weld inspection both exceed 99.5 percent," Huang said.

The project has produced more than 10 innovative technologies, including active control design, stress-free closure, digital pre-assembly, and environment-adaptive installation — clearing key obstacles for assembled construction of long-span arch bridges in mountainous regions.

With the girder joined, the bridge has entered its final sprint. This red arc across the Daxi River Gorge is both a tribute to ancient bridge engineering and a powerful calling card for China's infrastructure.