The Yellow River, seen as it passes through Haidong Prefecture in Qinghai Province, China.

ROBERT HARDING

RESOURCES

Silt, dams and hydraulic heroes

A study of China's Yellow River shows how water shapes the nation, finds **Philip Ball**.

China is not alone in having a water problem. But as with much else, its situation is unique. In *The Yellow River*, historian David Pietz examines why. Having done so much in modern times to expunge its past, China remains peculiarly constrained by it. Not only has every ruling power inherited the hydraulic legacy of its predecessors — for better or worse — but the idea that political legitimacy depends on "ordering the waters" is felt as keenly by modern leaders as it was by emperors from the Qin to the Qing.

Drought, flooding, unevenly distributed supplies, pollution — China suffers from them all, and then some. Floods have been recurrent and biblical, some of the worst (such as the flooding of the Yangtze and Huai in 1931) claiming more than one million lives. Droughts have produced calamitous famines, which, like that of 1876–79, could spark rumours of cannibalism.

China's water problems stem from its climate. The warm south often gets too much water; the cooler north, not enough. Both are sliced by a great river — the Yangtze to the south, the Yellow in the north — that often floods in summer. Both are fed by the glaciers of the Tibetan Plateau — the "water tower of Asia", shrinking with global warming.

By focusing on the Yellow River and its modern management, Pietz has limited his story. But it makes sense. The Yellow has long been the most potent symbol not only of China's woes, but of its ingenuity and resilience. After epic floods and droughts in the mid-nineteenth century, it became known as "China's sorrow"; in the following century, both Nationalists and Communists cultivated a myth of nationhood in which it was the "mother of Chinese civilization". Modern archaeology has dismantled the idea that a unified racial and cultural stock diffused from the Yellow River valley, but that story bound China's identity to its most troublesome river.

At the root of the problem is the yellow silt that gives the river its name, which is washed in from the northern loess soil plains. The river carries more silt per litre than any other. As it settles, the riverbed rises. Containment dikes have been built up, so that much of the river is essentially an aqueduct looming over the land. Any breach unleashes a flood.

The Yellow River: The Problem of Water in Modern China
DAVID A. PIETZ
Harvard University Press: 2015.

There is no easy solution. If the dikes confine the flow tightly, might its speed carry the sediment to the sea? Or is it better to let the river take its own course, confined only by levees to restrict the worst flooding? It seems impossible to find a compromise in the North China Plain, which is made from alluvial Yellow River deposits, is home to one-quarter of China's people and is the country's major source of wheat. As Pietz points out, deforestation on the loess plateau — already under way around two millennia ago — exacerbates the hazards. Attempts to tame the Yellow will always struggle unless erosion is addressed.

This book's value lies in showing that the issues are not confined to geology and engineering. Water in China is an unavoidably political issue because of cultural beliefs. Does any other nation's flood myth have a hydraulic engineer as the hero? By taming the water, Yü the Great was able to found the first dynasty, the Xia. Ever since, Pietz points out, controlling the waterways has been near synonymous with a mandate to rule.

When Sun Yat-sen founded the Republic of China in 1912, he saw that modernization depended on controlling the waters — for irrigation, flood control, transport and hydroelectric power. Turmoil, invasion and civil war hindered those plans until the People's Republic was established in 1949. Mao Zedong made use of the Yü template when his propagandists insisted that only the Communist state could combine collective enterprise with technological expertise to solve the old problems. But his hydraulic-engineering programme largely failed: many big dams, such as the silt-plagued Sanmenxia on the Yellow, were poorly planned and executed, and several collapsed. As Pietz notes, some Chinese engineers admit that they are still cleaning up the mess of the Mao era.

When China's economy began its post-Mao boom, new water crises arose. Since the 1990s, damming and overuse have meant that the Yellow River has repeatedly run dry before reaching the sea, and much of the country's fresh water is too polluted for human contact.

Yet the harm to the environment caused by improper water management — from soil salinization to industrial and urban waste — shows how water remains centre stage in China's political evolution. Unwilling or unable to enforce regulations, the Chinese government has tacitly devolved some responsibility to environmental pressure groups and activists who, Pietz writes, "could be successful only by understanding the limits of their activism", and reining in the criticism. In this way, water issues are driving a pluralism that, if not exactly democracy, is nevertheless broadening the political discourse. In one way or another, water is still shaping China. ■

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CORRECTION
The book review 'Fowl Domination' (*Nature* **515,** 490–491; 2014) wrongly called the book's author Adrian. His name is Andrew Lawler.