

Catastrophes and Climate Change in Ancient China

Kenneth J. Dillon, Scientia Press and Miao Li, graduate student in Communications, Georgetown University

Abstract: A revised and enhanced version of the Venus approach theory of Immanuel Velikovsky is applied to ancient Chinese catastrophes, yielding an explanation of the mythical floods (they were caused by gigantic tsunamis around 2200, 1628, 1210, and 820 BC). Gravitational tugs from Venus are argued to account for sudden climate changes, misalignments of buildings, and myths of resetting directions and calendars. The observatory at Taosi is interpreted as intended to track Venus for rituals including human sacrifice. The original version of the myth of Archer Yi and the ten suns is explained as closely matching a natural phenomenon.

1. Introduction

The history of Bronze Age China is full of puzzling phenomena. What caused the sudden changes in climate? Why were they so frequent and confusing? What are we to make of the flood myths? Why did the Liangzhu Culture of the Yangzi Delta region disappear so abruptly? Who was the Yellow Emperor? Who was Archer Yi, and why did he shoot down nine out of ten suns? How did the dragon come to be China's favorite icon?

Fortunately, there is a skeleton key that can unlock these old secrets. But to understand this key and use it appropriately, we must first come to terms with a remarkable case of scientific rejectionism that took place far from China.

The biggest controversy in planetary science since Copernicus and Galileo revolved around the question of whether Venus had once been a comet. Psychoanalyst Immanuel Velikovsky's 1950 book

*Worlds in Collision*¹ touched off a bitter debate that went on until his death in 1979 and, in a subdued but increasingly fruitful way, continues to this day.

Velikovsky interpreted the Greek myth that Athena had sprung fully armed from the head of Zeus to mean that the planet Jupiter had ejected Venus as a comet that then entered the inner solar system.² Every 52 years Venus approached Earth, Velikovsky argued; and their encounters caused tsunamis, earthquakes, and other catastrophes recorded in ancient texts. Finally, after many interactions with Earth and some with Mars, Venus circularized its orbit and gradually lost its cometary tail.

Not surprisingly, many scientists found this hard to believe. They pointed out numerous mistakes by Velikovsky. They considered the notion that Venus had exploded out of Jupiter especially bizarre and contrary to the laws of physics. In turn, this led many to consider Velikovsky a kook and to dismiss his theory out of hand.

With the passing of time, however, new evidence and reinterpretation have emerged. Instead of the unpersuasive argument that Venus burst forth from Jupiter, we now see that another myth that Velikovsky failed to interpret offers a satisfying explanation.

Zeus was said to have turned Metis, after impregnating her, into a fly who then zipped into his mouth. Metis gave birth to Athena inside of him, and then Athena emerged from his head. In effect, a Greek observer had spotted proto-Venus as Jupiter's immense gravity pulled it from the outer solar system and tidal friction heated it up to incandescence, and the Greeks called this Metis.

Tidal locking during such a passage by Venus past Jupiter can explain why Venus was depicted as ovoid in ancient times and why its rotation remains so slow and retrograde.

Once we reinterpret the origin of Venus in this way, then the remarkable astronomical, geological, archaeological, historical, calendrical, iconographic, and linguistic evidence that Velikovsky amassed in favor of the Venus theory comes to bear. And now much telling new evidence from Greece, the Ancient Near East, and China adds to it, as do new interpretations. Thus it seems fair to say that Velikovsky's Venus theory, with one important correction, has triumphed, though many peripheral issues remain open to debate.

¹ Garden City, New York: Doubleday and Company, 1950

² Velikovsky thought this occurred around 1500 BC, but now we know that it happened shortly before 2500 BC.

Velikovsky referred repeatedly to Chinese evidence to buttress his arguments, and his description of the Bronze Age catastrophes in China was accurate. But *Worlds in Collision* was never translated into Chinese, while the controversy appears to have had little resonance in China itself. Also, new evidence and interpretation regarding ancient China have appeared since 1950, and they need to be given due attention.

This inquiry can shed light on fundamental questions of Chinese history, provide insights into human adaptation to catastrophe and climate change, deepen our knowledge of climate change science and general Earth science, and offer us a rich agenda for further research.

2. Inversions, Tsunamis, and Floods

What gave rise to the flood myths of ancient China?

Velikovsky noted that Egyptian priests told Herodotus that the Sun arose twice in the east and twice in the west. He interpreted this to mean that during four interactions with Venus, Earth underwent 180°C degree inversions, and inertia caused enormous tsunamis that reached far into China's interior. While such tsunamis occurred in other places, those hitting the Western shore of the Pacific, Earth's greatest ocean, would have been larger and more devastating.

The first inversion may have been the 4.2 ka event around 2200 BC. The second seems to have been around 1628 BC.³ The last two may have been around 1210 and 820 BC.⁴ Presumably, on these four occasions Venus approached somewhat closer to Earth than on their other encounters (perhaps 32 interactions in the period 2550-800 BC). All these dates should be considered very provisional.

The Chinese geological and archaeological literature contain many references to "marine transgressions". It is said that the coastline was pushed as much as 100 km to the West.⁵ In all likelihood, some of these were not merely instances of hard-to-explain high sea levels but rather the consequences of

³ Mike Baillie, *Exodus to Arthur: Catastrophic Encounters with Comets* (London: B.T. Batsford, 1999), 54

⁴ David Kaniewski *et al.*, Environmental Roots of the Late Bronze Age Crisis. *PLoS ONE* 8(8): e71004 (2013)

⁵ Gideon Shelach-Lavi, *The Archaeology of Early China: From Prehistory to the Han Dynasty* (New York: Cambridge University Press, 2015), 166; Li Liu, *The Chinese Neolithic: Trajectories to Early States* (Cambridge: Cambridge University Press, 2004), 197

enormous tsunamis; and these tsunamis flooded at least as far as the Shang capital Anyang, 250 km from the present coastline, if the discovery of the remains of a whale near Anyang is any indication.⁶

The ca 2200 BC tsunami seems to have utterly destroyed the Liangzhu Culture in the Yangzi Delta region, leaving it swamped for decades.⁷ It devastated the Longshan Culture of north-central China as well. The archaeological sites dated to the succeeding Yueshi and Erlitou (Xia) cultures number only 14 and 20 percent of the Longshan sites, respectively.⁸ Not only was there terrible loss of life. The advanced neolithic culture of Liangzhu was replaced, it appears from the archaeological record, only after several hundred years by the much less sophisticated Maqiao culture, so abundant knowledge, skills, and property including livestock were lost.⁹ Thus the flood myths were based on historical reality, and the floods were not caused by excessive rainfall and river flows.



Still, the characteristics of the tsunamis remain to be elucidated. How high were they when they hit the coastline? How far inland did they penetrate? How much water did they contain? Did they in fact take many years to drain away from China's interior, as the myths suggest? How did they differ from typical seaquake-induced tsunamis? Were there indeed four? Were they all roughly equal in size, or did the first and third one, coming across the Pacific, far surpass the second and fourth, coming from the Pacific, indeed, but on an inverted Earth and so perhaps being significantly smaller?

Evidence from China can help in answering these questions. For instance, a hunt for the remains of whales and other sea creatures in the interior of China can show how far the floods penetrated. But much of the evidence needed to characterize the tsunamis will have to come from investigations around the entire world.

The floods, along with the accompanying earthquakes and volcanic eruptions caused by close approaches of Venus, drastically affected the political and social systems of the Chinese dynasties. As a

⁶ K.C. Chang, *The Archaeology of Ancient China*, 4th ed. (New Haven: Yale University Press, 1987), 139

⁷ Shelach-Lavi, 166; "The increase in the number of hydrophyte and hydrobiontic algae during the late Liangzhu period suggests significant expansion of water area at that time." (Research on the Disappearance of Liangzhu Culture through Pollen and Algae Analysis, *Journal of Tongji University*, Natural Science Edition, 2008, Vol. 36(3)) ("良渚后期水生植物和水生藻类的大量出现表明当时水域面积扩大." 张玉兰. 从孢粉、藻类分析探究良渚文化突然消亡的原因. 同济大学学报自然科学版, 2008, 第36卷第3期.)

⁸ Liu, 31

⁹ D.J. Stanley, Chen Zhongyuan, and Song Jian. Inundation, Sea-Level Rise and Transition from Neolithic to Bronze Age Cultures, Yangzi Delta, China. *Geoarchaeology* 14(1) (1999): 15-26

working hypothesis, we can assume that the tsunamis played a key role in undermining the various dynasties, though collapse and replacement might have required many decades or even a century or two. Thus Longshan Culture, perhaps the Yǔ dynasty mentioned in Chinese texts,¹⁰ collapsed in the aftermath of the putative ca 2200 BC tsunami. The Xia dynasty collapsed following the putative ca 1628 BC tsunami. Shang collapsed following the putative ca 1210 BC tsunami. And the Western Zhou dynasty's unified power disintegrated following the putative ca 820 BC tsunami.

While it is true that the capitals of the Xia and Western Zhou dynasties were in the West, the references in texts associating them with the West might alternatively be interpreted as alluding to the post-inversion rise of the Sun and Venus in the West during their sways. Similarly, Shang was associated with the East, and the Sun presumably arose in the East both during Longshan and the post-Western Zhou era. Here is a notional dynastic table, offered with the proviso that the putative inversion/tsunami dates are tentative and approximate.

Dynasty	Dates	Inversion/Tsunami	Key Site	Sun/Venus rose in
Longshan/Yǔ?	3000-2000 BC	2200 BC	Taosi	East
Xia	1970-1600 BC	1628 BC	Erlitou	West
Shang	1600-1046 BC	1210 BC	Zhengzhou/Anyang	East
Western Zhou	1045-771 BC	820 BC	Haojing/Luoyang	West
Eastern Zhou	770-250 BC	none	various	East

¹⁰ Bernhard Karlgren. Legends and Cults in Ancient China. *Bulletin of the Museum of Far Eastern Antiquities*, No. 18 (1946): 199-365, pp. 217-8

3. Climate Changes

What kind of climate changes did these cataclysmic events lead to?

Since Venus and Earth interacted perhaps 32 times on a 52-year cycle, and each interaction involved at least a small gravitational tug on Earth that would displace its body in a minor or occasionally major way, there were actually many climate changes. And some would have cancelled each other out. Also, the interactions caused perturbations in Earth's orbit that affected the amount of insolation, while the dust from volcanoes set off around the world tended to cool the climate.

Northern China's climate was 2-4°C warmer and moister than at present during the Holocene Climate Optimum from 7000 BC to 3000 BC. During the warm period, the population in China increased significantly. The area of cultivated dry lands expanded extensively, moving 300 kilometers farther north than the current boundary between farming and pastoral zones.¹¹ In the west, farming culture reached the east of Qinghai Province. Neolithic relics have been discovered even in a few places in the Tibetan Plateau that are uninhabited nowadays.¹²

Bamboo grew and giant pandas lived far north of their current habitats.¹³ Rice was cultivated in the Yellow River area; and mulberries, jujube trees, and chestnut trees grew even to the north of the river, according to the *Shi Ching* (Book of Odes). Elephant remains have been found in the North.¹⁴

Meanwhile, around 3000 BC the sea level was 2-4 meters higher than at present, leading to transgressions along the coast, though these were not as extensive as earlier ones.¹⁵

¹¹ Zhenqing Chi, New Discoveries of and Discussion on Ancient Human Stone Implement in Mid and North Mongolia. Master Dissertation of China University of Geosciences, 1996. (迟振卿, 内蒙古中北部古人类石器的新发现及初步研究, 中国地质大学硕士学位论文, 1996.)

¹² Wenxiang Wu and Dongsheng Liu, The Temperature Drop Event Around 4 kaBP and The Birth of Chinese Civilization. *Quaternary Sciences*, 2001, Vol. 21(5): 443-451. (吴文祥, 刘东生, 4,000 kabp前后降温事件与中华文明的诞生. 第四纪研究, 2001, 第21卷第5期: 443-451.)

¹³ Marjorie G. Winkler and Pao K. Wang. The Late Quaternary Vegetation and Climate of China. In: *Global Climates Since the Last Glacial Maximum*, ed. H.E. Wright *et al.* (Minneapolis: University of Minnesota Press, 1993), 221-64, p. 232

¹⁴ Joseph Needham, *Science and Civilisation in China, Vol. 3: Mathematics and the Sciences of the Heavens and the Earth* (Cambridge: Cambridge University Press, 1959), 463-4

¹⁵ Tracey L.-D. Lu. Mid-Holocene climate and cultural dynamics in eastern Central China. In: *Climate Change and Cultural Dynamics: A Global Perspective on Mid-Holocene Transitions*. David G. Anderson *et al.*, eds. (Amsterdam: Academic Press, 2007), 297

After 3000 BC there was a minor cooling trend that abruptly sharpened around 2500 BC, soon after Venus entered the inner solar system and presumably began to interact with the Earth. We may suspect that minor shifts in the orientation of the Earth's body were the cause (see the later discussion of the Gong Gong myth). The climate is also generally thought to have become drier, yet one view is that precipitation actually increased.¹⁶ Then, around 2200 BC, a catastrophic event occurred (the global 4.2 ka event) that is entirely consistent with an inversion that set off a gigantic tsunami. This is what appears to have devastated Longshan and to have completely destroyed Liangzhu.

A colder, drier climate seems to have characterized the Xia dynasty era from 1970 BC onward. Then there was a second inversion around 1628 BC. It must have set off a tsunami, but the evidence that this putative tsunami was as thoroughly destructive as the first one is lacking. The shift to the Shang dynasty was accompanied, it seems, by a warming trend that made the temperature in Northern China perhaps 2°C warmer than present-day temperature. In turn, around 1210 BC there was another inversion and tsunami (parallel to the great Bronze Age catastrophe in the Eastern Mediterranean). These led ultimately to the overthrow of Shang by the Western Zhou dynasty around 1046 BC. An indication that this third tsunami was of the magnitude of the first is that it appears to have completely swept away the people and culture of the Yangzi Delta region, just as had happened 1000 years before with Liangzhu but had evidently not happened at the time of the second tsunami around 1628 BC.¹⁷

During the Western Zhou period, the evidence regarding temperature is complex. Some evidence suggests that climate became colder than during Shang or in the present day. The *Bamboo Annals* report that at various times the Han and Yangzi Rivers froze. A major drought occurred, and the Jing, Wei, and Luo Rivers ran dry.¹⁸ Yet the presence of bamboo and plum in Northern China, plus possible double-cropping, suggests that during the Western Zhou era temperatures were warmer than today's.¹⁹ Finally, after a fourth inversion around 820 BC, Western Zhou's power crumbled, and it was replaced in 771 BC. There is no evidence that the putative tsunami connected with this inversion was of the magnitude of the first and third tsunamis.

¹⁶ Ibid.

¹⁷ Shiyong Yu *et al.* Role of climate in the rise and fall of Neolithic cultures on the Yangtze Delta. *Boreas*, 29 (2000): 157-65, 157. These researchers write that "the civilization in the region terminated mysteriously" around 3000 BP, which can be taken to refer to roughly 1210 BC.

¹⁸ Michael Loewe and Edward L. Shaughnessy, eds., *The Cambridge History of Ancient China: From the Origins of Civilization to 221 BC*. (Cambridge: Cambridge University Press, 1999), 35

¹⁹ Ibid.

Four patterns emerge from this account. First, the climate changes that occurred between 2550 and 800 BC are roughly consistent with the suggested pattern of inversions and tsunamis, but they are much more complicated, presumably because of sub-inversional events that also made minor or even major changes in the orientation of the Earth's body and thereby the climate. Another factor might have been a shift from initial disruption immediately following an inversion to an adjustment to a more benign long-term climatic regime. Second, the climate during "upright" phases when the Sun rose in the East (before 2200 BC, during Shang, and after 820 BC) was generally but not always warmer, while the "inverted" phases when the Sun rose in the West (Xia and Western Zhou) had generally colder and drier climates. Third, the first and third tsunamis, which marked the transition from upright to inverted phases, were of a much greater magnitude than the putative second and fourth tsunamis, which occurred during the transition from inverted to upright positions of the Earth. Fourth, at times severe droughts occurred in various parts of China. Fairly often northern China experienced drought at the same time that rain-fed floods inundated the Yangzi region in a way that reflected or amplified the typical pattern of the monsoon when it does not reach north into the Yellow River region.²⁰

4. Impact and Adaptation

We can define the Bronze Age catastrophes worldwide as occurring amid repeated climate changes between roughly 2550 BC and 800 BC, and thus encompassing various neolithic, Bronze Age, and Iron Age cultures. In Mesopotamia, the Akkadian Empire reached its political peak between 2400 and 2200 BC, then collapsed in 2154 BC. The Indus Valley Civilization lasted from 2600 BC to 1900 BC. Many other cultures underwent turmoil at this time, and their travails appear to have been closely related to climate change and catastrophic events such as floods, droughts, and marine transgressions.

What were the consequences of these repeated catastrophic events for the people of China? How did they react to the catastrophes? Social, political-military, economic, and religious dimensions all afford insights.

²⁰ Wenxiang Wu and Tungsheng Liu. Possible role of the "Holocene Event 3" on the collapse of Neolithic Cultures around the Central Plain of China. *Quaternary International* 117 (2004): 153-66

Social Changes

The most direct impacts of catastrophes and climate change in China seem to have been migration and collapse. Geological studies show that human societies in ancient China migrated from the higher dry lands in the north toward the lower southeast around 2200 BC. Meanwhile, more nomadic cultures replaced farming cultures. For instance, the Qijia culture in Gansu and Qinghai area was known for planting millet. It was later replaced by the nomadic Siwa culture.²¹ This might have been caused by the cooling weather, which became too cold and dry for crops to grow.

Longshan Culture had reached a sophisticated level but with great economic class disparities, attested to by the high concentration of beautiful jade and eggshell porcelain objects in a small minority of graves. Over 40 townsites, prototypes of cities, have been discovered. In contrast, the sparser settlements of the succeeding Yueshi Culture show a much lower level of productive capacity and social development. Some scholars ascribe the transition to a devastating flood caused by the changing course of the Yellow River.²² Here this is suggested to be the work of a tsunami.

In the ancient flood myths of China, the deluge happened during the time of Emperors Yao, Shun, and Yu and was depicted as the work of rebels. The flood myths transformed the act of taming the flood into a question of suppressing violence or insurrection and thus provided general ideas about the founding of social order through the imposition of hierarchical divisions,²³ though it seems that pre-flood China was already significantly hierarchical. At any rate, the floods appear initially to have undermined the prestige and control of the emperors and given rise to chaos and social unrest. Thus they hampered the progression of Chinese civilization, yet they also stimulated governments to re-establish social order, which led to the formation of cities and eventually central states.

An understanding of the tsunamis can also help us better interpret evidence of the “collapse” of a society. The use of this term in regard to 3000 to 2000 BC as a period of “collapse of Neolithic Culture”

²¹ Yajun Peng, Qianli Sun, Jing Chen and Maotian Li, the Features of Climate Distribution in Different Regions around 4.0kaBP and the Impact on the Development of Ancient Cultures. *Geological Review*, 2013, 9(2): 248-266. (彭亚君, 孙千里, 陈静, 李茂田, 中国4.0kaBP前后气候的空间分布特征及其对史前文明变迁的影响. *地质评论*, 2013, 9(2): 248-266.)

²² Song'an Jin and Xinping Zhao, Discussion on the Historic Status of Shandong Longshan Culture and the Reasons of Its Collapse. *Journal of Zhengzhou University*, 1994(4): 1-7. (靳松安, 赵新平, 试论山东龙山文化的历史地位及其衰落原因. *郑州大学学报*, 1994(4): 1-7.)

²³ Mark Edward Lewis, *The Flood Myths of Early China* (Albany: SUNY Press, 2006), 76

has been criticized as ignoring “the fact that the foundation of Chinese civilization was established exactly in this period.”²⁴ In fact, both views are correct. Longshan Culture suffered a severe collapse as a result of the devastating tsunami, while Liangzhu Culture was completely swept away, aside from its artefacts. Yet enough people survived in the mountains and in the West to bring about a resuscitation of Chinese culture.

Economic Change

According to the authors of the *Mencius* (Chapter 10:7), “During the time of Emperor Yao, the world was in great turbulence. Floods ran everywhere. The wild trees and grass flourished, while crops declined. Fierce beasts and birds disturbed people. Their traces were everywhere in China. Emperor Yao was deeply concerned. He appointed Shun to manage the situation.” Thus, along with social unrest, the floods caused economic damage, specifically to crops.

During Emperor Yu’s time, according to later accounts, the efforts in channeling the floods also contributed to the development of farming. The *leisi* (耒耜), the tool Emperor Yu was said to use to channel floods, was also adopted in farming for tilling lands. The wide adoption of the *leisi* represented significant progress in farming technology. Meanwhile, the canals Emperor Yu created not only channeled the floods but also served as the irrigation system for crops after the floods went away. As a result, irrigation farming was gradually developed.²⁵ Whether or not Yu deserved the credit, clearly controlling the floods afforded opportunities for innovation.



The change in farm crops in the same area in different times also reflects how climate change influenced the economy. During the early- and mid-Longshan age in Shandong, both rice and millet were cultivated. Rice significantly boosted the production capacity and contributed to the prosperity of

²⁴ Lu, 319-20. The Chinese evidence runs counter to the view expressed in Patricia A. McAnany and Norman Yoffee, *Questioning Collapse. Human Resilience, Ecological Vulnerability, and the Aftermath of Empire* (Cambridge: Cambridge University Press, 2010), 177 that there were no collapses anywhere among ancient states.

²⁵ Xingguang Wang, Discussion on Early Agricultural Development and Emperor Yu Taming the Floods. *The Central Plains Culture Research*, 2014(2). (王星光,大禹治水与早期农业发展略论. 中原文化研究, 2014(2).)

Longshan. However, in the colder climate after 2200 BC, millet became the main crop in the same area. As a result, productive capacity was diminished and therefore could no longer support a large population. This added an economic dimension to the demise of Longshan.²⁶

Other examples of humans adapting to the changing environment include the first use of wells and adoption of stock raising. Wells first appeared in Songze when the climate got cold and dry.²⁷ People living in the harsh Loess Plateau started stock raising 3,000 years earlier than those living in the mild Yangzi River region.²⁸

Meanwhile, the towns also suffered from the floods and earthquakes, though the exact impact on crafts and economic activity is unclear.

Another response of rulers to the catastrophes, and specifically to the inversions, was to command scholars and subordinates to map out the new situations with new calendars and new designations of directions. Thus, Emperor Yao “commanded the Hsis and Hos, in reverent accordance with (their observation of) the wide heavens, to calculate and delineate (the movements and appearances of) the sun, the moon, the stars, and the zodiacal spaces, and so to deliver respectfully the seasons to be observed by the people.” Yao went on to dispatch scholars to east, south, west, and north in order to establish the seasons according to the heavens and for the use of the people.²⁹ Calendars had the special importance of precisely setting out the times when various agricultural activities would take place in order that they optimally fit the cosmological pattern. They were also important for determining the dates of rituals. Xia, Shang, and Zhou each had to re-establish directional order and create a new calendar after a displacement of Earth’s body during an inversion.³⁰

²⁶ Xiaohu Zhang, Zhengkai Xia, Xiaoyan Yang and others, The Changes in the Economic Form of Ancient Yellow River Region to the 4 kaBP Event. *Quaternary Sciences*, 2008, 28(6): 1061-1069. (张小虎,夏正楷,杨晓燕,等,黄河流域史前经济形态对4kaBP气候事件的响应.第四纪研究,2008,28(6): 1061-1069.)

²⁷ Yan Zhu, Fahu Chen, Jiawu Zhang and others, Initial Discussion on the Influence of Environment Deterioration 5,000 Years Ago on Neolithic Culture in China. *Progress in Geography*, 2001, 20(2): 111-118. (朱燕,陈发虎,张家武,等,距今五千年左右环境恶化事件对我国新石器文化的影响及其原因的初步探讨.地理科学进展,2001,20(2): 111-118.)

²⁸ Ibid

²⁹ William Legge, trans., *The Shu King, the Canon of Yao*. London, 1879, 32 ff; Velikovsky, 115

³⁰ Lewis, 30; Loewe and Shaughnessy, 19-20

The Political-Military Dimension

In the Annals of the Five Emperors, the first chapter of *The Records of the Grand Historian* by Sima Qian (《史记》) around 109 BC, the most striking stories were the ones about massive battles. We can treat them as likely reflecting historical events but with uncertain dating and details, and containing an ample dose of myth.

According to Sima Qian, around 3000 BC the Yellow Emperor first fought with the Flame Emperor at the Battle of Banquan. The Yellow Emperor and the Flame Emperor are considered as ancestors of the Chinese people. After three major engagements, the two made an alliance. The Battle of Banquan is credited with the formation of the Huaxia (Chinese) tribes, which is the foundation of Chinese civilization.

The Huaxia tribes spread along the Yellow River towards the East China Sea, while the Jiuli, led by *Chi You*, developed from the south and expanded towards the west. The Huaxia and Jiuli tribes were in conflict over the fertile land in the Yellow River valley and then fought at the Battle of Zhuolu.

Myths turned the Yellow Emperor into a super-human, but we can see that originally he was Venus and that his battles refer in part to the encounters of Venus with Mars, in one case the Flame Emperor (*Yandi*=Mars) and in another case *Chi You* (also Mars). The best explanation of battles against two variants of Mars is that Venus and Mars interacted on more than one occasion, and the Chinese myth makers threaded these interactions into their accounts of actual earthly combats. Thus in a parallel to the *Iliad's* simultaneous celestial and terrestrial battles between Greeks backed by Athena (Venus) and Trojans backed by Ares (Mars), the Huaxia led by *Huangdi* (Venus) fought the Jiuli (including the Miao) led by *Chi You* (Mars).

Here is a depiction of the Yellow Emperor (*Huangdi*=Venus) as a dragon in combat with *Chi You* (Mars) as a bull, which came to be a totem of the Miao people.



What caused the battles?

In the myths, the tribes fought for fertile lands. Looking into the external environment during that time, we find two other very different possible answers.

First, as a result of the favorable warm climate during the Yangshao Age (5000 BC to 3000 BC), the expansion of farming led to a larger population. But when the climate became colder and drier in Northern China after 3000 BC and especially around 2500 BC, the supply of land suitable for agriculture diminished. The resulting concentration of population might have pushed tribes to fight and compete for resources.

Second, the terrible flood caused by the 2200 BC inversion and giant tsunami presumably wiped out much of the population of wide stretches of Eastern China. In the chaotic aftermath, various tribes may have migrated/invaded and clashed over control of land and natural resources.

At present, we lack the information to choose between these explanations, or indeed to decide whether neither or both pertain.

Meanwhile, the catastrophic events attributed to the era of Emperor Yao, Shun, and Yu may have had a long-term political impact. Scholars argue that taming the flood not only promoted the development of early farming, but also contributed to the forming of perhaps the first state in Chinese history.³¹ Similar to the founding of a state in ancient Egypt as a result of managing the floods of River

³¹ Xingguang Wang, Discussion on Early Agricultural Development and Emperor Yu Taming the Floods. *The Central Plains Culture Research*, 2014(2). (王星光,大禹治水与早期农业发展略论. 中原文化研究, 2014(2)). This assumes that no state formation occurred before 2200 BC despite the evident sophistication and hierarchical development of Longshan Culture.

Nile, the first state in China may have been formed to unify the forces of tribes to fight against catastrophes.³²

People reacted to the changing environment and unsettled society by building more advanced weapons and strengthening defenses. Abundant handheld weapons and fine bows and arrows have been found in Longshan sites, leading to changes in methods of combat and results of wars.³³ Meanwhile, trenches were discovered around many Longshan cities, presumably playing a role in defending the cities from invaders.³⁴

These patterns, in part simply amplifying pre-catastrophe trends, persisted throughout the era of the catastrophes and on into the time of the Warring States.

Religion: An Upsurge in Human Sacrifice

During the Longshan age (3000 BC to 2000 BC), both the amount and variety of religious relics boomed. In addition to numerous altars, tombs, and sacrificial pits, there were many ritual vessels, and human sacrifice became more common.³⁵

There were two types of human sacrifice: funeral sacrifice and sacrifice to gods and ancestors. In funeral sacrifices, live humans were killed to provide companionship for the dead tribe leader or the head of a family. As for the latter, some scholars believe that human sacrifices were used to pray to gods and ancestors for a good harvest or recovery of the earth's prosperity.³⁶ Human sacrifice reached an astonishing level in the Shang Dynasty.

³² Hui Wang, The Deluges During the Era of Emperor Yao and Emperor Shun and the Origin of Early State in Ancient China. *Journal of Shaanxi Normal University* (Philosophy and Social Science Edition), 2005, 34(3). (王晖, 尧舜大洪水与中国早期国家的起源. 陕西大学学报(哲学社会科学版), 2005, 34(3).)

³³ Yaopeng Qian, The Timing and Truth about Shun's accession after Yu - An Important Clue on the Formation and Development of State in Ancient China. *Social Science Front*, 2000(5): 127-137 尧舜禅让的时代契机与历史真实——中国古代国家形成与发展的重要线索. *社会科学战线*, 2000(5): 127-137.

³⁴ Jianxin Cui and Shangzhe Zhou, Analysis on the Evolution Dynamics of Chinese Neolithic Culture. *Journal of Chinese Historical Geography*, 2008(2). (崔建新, 周尚哲, 中国新石器时代文化演变动力分析. 中国历史地理丛论, 2008(2).)

³⁵ Fen Wang, Religious Relics in the Neolithic Era in China. *Sichuan Antiquities*, 2004(4): 17-25. (王芬, 中国新石器时代的宗教遗迹. 四川文物, 2004(4): 17-25.)

³⁶ Lei Wang, Discussion on Human Sacrifice in Longshan Age. *Southeast Culture*, 1999(4): 22-27. (王磊, 试论龙山文化时代的人殉和人祭, 东南文化, 1999(4): 22-27.)

The pattern elsewhere in the world of human sacrifices to Venus³⁷ suggests that the increase in Longshan and the very high numbers in Shang were to propitiate Venus. In some cases these human sacrifices were for the ancestors, presumably either to induce them to intercede with Venus or to ensure that they were not somehow offended and therefore unleashing destruction. In other cases, the human sacrifices may have been directly offered to Venus; but specific evidence for this is thus far lacking.

The astronomical observatory at Taosi in Shanxi, variously assigned dates ending between 2100 and 1900 BC, has been interpreted as a solar observatory.³⁸ However, many alignments make no sense for tracking the rising Sun in the East, and after 2200 BC the Sun was rising in the West anyway! The alignments on both ends of the curving row in the site extend well beyond solstice points and can perhaps best be interpreted as tracking the Evening Star/Comet as it set in the East. In addition, both the central observation point and the overall layout of the site appear to be oval, not circular, perhaps intended to be in keeping with the known ovoid shape of Venus in ancient times, a consequence of the tidal pull of Jupiter. Ovals would presumably signal devotion to Venus as it passed above. Thus the Taosi site can be interpreted as primarily a Venus observatory. As such, it would have served as the ideal setting for human sacrifices to Venus.³⁹ This would also fit with the powerful needs to track the whereabouts of Venus as a threat and an omen (e.g., of war). Venus was a war god. According to *Huainanzi* 3:7b:5, “When (Venus) should appear but does not appear, or should not yet disappear but does disappear, throughout the world armies will be withdrawn. When Venus should disappear but does not disappear, or should not yet appear but does appear, throughout the world armies will set forth.”⁴⁰

According to computational simulation, the observatory was not likely for the observation of change of seasons. Rather, it was likely for the observation of a specific date or an astronomical sign for people to start a sacrificial ceremony. It might have been for the observation of other planets or comets as

³⁷ Velikovsky, 162, 164, 185, 196-7, 258, 262 of the Paradigma Ltd. 2009 edition

³⁸ David W. Pankenier, *Astrology and Cosmology in Early China: Conforming Earth to Heaven* (New York: Cambridge University Press, 2013); David W. Pankenier, Ciyuan Y. Liu, and Salvo De Meis. The Xiangfen, Taosi Site: A Chinese Neolithic “Observatory”. *Archaeologia Baltica* 10 (2009): 141-7; Wu Jiabi, Chen Meidong, and Liu Ciyuan. Astronomical function and date of the Taosi observatory. *Science in China Series G: Physics, Mechanics & Astronomy*, 52/1 (2009): 151-8; Li, 32-3.

³⁹ Some human sacrifice remains have been found in the foundation of an adjacent building. He Nu. “The Longshan Period Site of Taosi in Southern Shanxi Province” in Anne P. Underhill, ed., *A Companion to Chinese Archaeology* (New York: Wiley, 2013), 255-77, p. 267. For a parallel, see Ivan Ghezzi and Clive Ruggles. Chankillo: A 2300-Year-Old Solar Observatory in Coastal Peru. *Science* 315 (2 March 2007): 1239-43.

⁴⁰ Major, 76

well.⁴¹ During the era of Emperor Yao, who was said to reside at Taosi, astronomy was of great importance to the people. Astronomical historian Xiaoyuan Jiang points out that Emperor Yao's political achievements were recorded in *Shang Shu: Canon of Yao* in 225 characters, of which 172 characters were about astronomy.⁴² What drew people's attention to the sky?

5. Myths

An understanding of the role of Venus in the catastrophes can help us interpret famous myths. It also tells us why there is such a plethora of flood stories, characters, and identities of Venus: these reflect the multiple tsunamis/floods and the efforts of people throughout China to come up with names and explanations for the strange, frightening phenomena they witnessed.

The large body of Venus blocked sunlight from the central portion of the cometary tail, leaving two long bright streaks on the sides. In the Near East, these were seen as horns, so Venus was called the Bull of Heaven. In China, the curve of the body of Venus and the two streaks were evidently seen as a bow, so the mythical Archer Yi with his vermilion bow was Venus. While one version of the myth had Yi shoot down nine of ten suns appearing simultaneously in the sky because they made the Earth too hot, there was a vigorous competing version that spoke of ten alternating suns.⁴³ In effect, as the Sun followed a different track across the sky on each day of an inversion, Yi's bow, directed by the solar wind, would track the new sun. The ten suns were reported as an ill omen at the ends of the Xia dynasty (*Bamboo Annals*) and of the Shang dynasty (*Huainanzi*, 15/6b).⁴⁴ Over time, Archer Yi, who began in the East, became identified with the West as well,⁴⁵ presumably because Venus and the Sun rose in the West.

⁴¹ Yong Li, The Earliest Taosi Observatory and its Possible Years. *Studies in the History of Natural Science*, 2010 Vol. 29(3): 259-270. (李勇,世界最早的天文观象台陶寺观象台及其可能的观测年代. 自然科学史研究, 2010, 第29卷第3期: 259-270.)

⁴² Jiabi Wu, Taosi Astronomical Observatory and Archaeological Astronomy. *Science Technology and Dialectics*, 2008(5): 90-96. (武家壁,陶寺观象台与考古天文学. 科学技术与辩证法, 2008(5): 90-96.)

⁴³ Sarah Allan, *The Shape of the Turtle: Myth, Art, and Cosmos in Early China* (Albany: SUNY Press, 1991), 26

⁴⁴ Allan, 38

⁴⁵ Allan, 37

Venus was yellow when it first appeared, hence the Yellow Emperor with his human face and dragon tail. Then it turned red as interplanetary dust and dust rising from catastrophes on Earth obscured vision: the Vermilion Bird, the Red Pearl, etc.

In another myth, the *Jingwei* bird constantly carries wood and stones from the western mountains to build a dike against the Eastern Sea.⁴⁶ This is a rare specific reference to floods being caused by transgressions resulting from tsunamis.

Lastly, we have the myth of Gong Gong: “Anciently Gong Gong and Zhuan Xu fought, each seeking to become the Thearch (Emperor). Enraged, they crash against Mt. Buzhou; Heaven’s pillars broke, the cords of Earth snapped. Heaven tilted in the northwest, and thus the sun and moon, stars and planets shifted in that direction. Earth became unfull in the southeast, and thus the watery floods and mounding soils subsided in that direction.” *Huainanzi* 3:1a:1.⁴⁷ This seems to refer to a displacement of Earth’s body resulting from an encounter with Venus. Note the northwest-southeast slant, which may derive from a twisting movement characteristic of a “tippe top” in response to a torque caused by an approach of Venus.⁴⁸ While perhaps only a 10° change in latitude, not a 180° inversion, such a displacement could affect climate to an extent that would rival the change caused by an inversion, thus complicating the effort to specify the dates and distinctiveness of inversions. Such displacements might also account for the departures from true north in the alignments of Xia and Shang buildings. Those at Erlitou (Xia) were oriented 6-10° west of present-day north; those at Shang sites were oriented 7° east of present-day north.⁴⁹

Venus and Mars were depicted as dragons because of their cometary tails (in Mars’ case borrowed). Dragon combats became a perennial art genre. The popular imagination spread the notion to include sea serpents and sea horses, some of which had been swept inland by the tsunamis. Thus the proliferation of dragons in imagery, the depiction of sages with human heads and dragon tails, and possibly the belief that seahorses have special potency became part of Chinese culture. One example is the imperial flag of the Manchus, which has a dragon with a red ball (presumably Venus) in front of its mouth and twin tails on the front that seem over time to have changed orientation from being the tails of the ball/Venus.



⁴⁶ Lewis, 10

⁴⁷ Major, 62

⁴⁸ Peter Warlow, *The Reversing Earth* (London: J.M. Dent & Sons, 1982), 28 ff

⁴⁹ Li Feng, *Early China. A Social and Cultural History* (Cambridge: Cambridge University Press, 2013), 60; Pankanier, 2013, 119-22.

6. Ambiguities

This entire subject is rife with ambiguities that call out for further analysis and investigation. Here are some examples:

- There was a trend toward desiccation before the catastrophes, so the catastrophes only boosted it and by a hard-to-determine amount.
- The Yellow River has changed course many times before and after Bronze Ages, so it is not easy to link course changes specifically to tsunamis. The Yellow River shifted south to empty into the Yellow Sea ca 2600 BC, then back north to the Bo Hai ca 2000 BC, but whether the change was associated with a tsunami-caused flood is hard to say.⁵⁰
- In the pre-Venus era, higher sea level had caused transgressions, so it is not clear exactly what tsunamis added to this. And how did a tsunami caused by inertia resulting from an encounter with Venus differ from a common tsunami caused by a seaquake? How can we distinguish between damage from flooding and damage from the giant earthquakes and volcanic eruptions set off by closer approaches of Venus?
- Were the references to Venus in the West simply noting its role as the Evening Star, or were they evidence that Venus and the Sun were rising in the West?
- There are alternative explanations for many aspects of iconography, including for those ascribed here to Venus. They tend to be *ad hoc* whereas the ascriptions according to the Venus theory are consistent and at times mutually supportive.
- Various explanations of human sacrifices exist, so why ascribe them to a desire to propitiate Venus? The answers here would be the dramatic surge in their numbers at the time of the catastrophes and the parallel with human sacrifices in other parts of the world that are connected to Venus.

⁵⁰ Loewe and Shaughnessy, 32

7. Conclusions

This discussion suggests four main conclusions.

First, we are in the presence of a remarkable case of scientific rejectionism, one that has left its imprint on the study of Chinese history. Velikovsky's critics pointed out many errors, but they were too eager to rush to judgment and too willing to overlook the large body of telling evidence (some of it Chinese) that Velikovsky had assembled regarding Venus. The correct approach would have been to withhold judgment and keep investigating. Instead, they threw the baby out with the bathwater. In turn, their rejectionism has led to many errors in science and history.

Lending support to the rejectionists was the phenomenon of Cultural Amnesia that Velikovsky described. We can readily understand that ancient Chinese writers following the end of the catastrophes would have been determined to screen out accounts of the Sun and Venus rising in the West as contrary to reason and thus demonstrably false. The dread of Venus and efforts to propitiate it, in particular, made no sense at all at a time when Venus had lost most of its tail in encounters with Earth and Mars, had ceased to approach Earth, and had become the benign companion of the Sun. In addition, evidence that survived their filtering was reshaped to fit their preconceptions, as in the Daoist reworking of the Yellow Emperor or in the story of Archer Yi and the ten suns.

Thus, in addition to having to sort through the tangled and controversial legacy of the rejection of Velikovsky, we confront the major challenge of seeking to discern the underlying patterns that have been obscured by Cultural Amnesia. It is fortunate that we now possess such a formidable skeleton key.

Second, this inquiry leads to several conclusions regarding ancient Chinese history, including its global context.

- It shows that the better we comprehend what was going on around the world during the Bronze Age catastrophes, the better we can interpret the Chinese evidence. For instance, the many accounts of the encounter (battle) between Venus and Mars in the *Iliad* and

other world sources can help us better interpret the battles between the Yellow Emperor (*Huangdi*) and the Flame Emperor (*Yandi*) and *Chi You*.

- Catastrophes caused by encounters with Venus, and in particular the inversion-induced tsunamis, did much to set the rhythm of dynastic change in Bronze Age China. Among other things, they provide a context for linking the shadowy Yǔ dynasty with Longshan Culture. While we may never find totally convincing evidence of this, Yǔ appears as a dynasty without a culture, and Longshan as a major culture without a dynasty, a suggestive juxtaposition; and this era was terminated by a tsunami just as the succeeding dynasties and cultures were.
- Chinese civilization ascended to heights of sophistication and fruitfulness in the teeth of enormously destructive natural catastrophes that repeatedly wiped out people, skills, and material assets, forcing the survivors to build anew. On the one hand, these setbacks wasted much and delayed development; on the other hand, there may have been an element of creative destruction in them that led to an even greater flourishing of Chinese culture in the Warring States and Han periods.
- We can now better interpret existing evidence, for instance, in regard to human sacrifices; and we know where to look for more evidence, e.g., for remains of sea creatures far inland.
- Meanwhile, insights from China can contribute to the overall understanding of the role of Venus, of inversions, and of other aspects of the Bronze Age catastrophes. China provides, for instance, useful evidence regarding dates and sequences of events. Velikovsky very effectively used Chinese evidence to corroborate his arguments, which were based largely on evidence from the Ancient Near East and Greece.
- In addition, Chinese evidence can help us better interpret myths as a source of historical and scientific facts and hypotheses. In a nutshell, some myths are fanciful; others contain important truths. Curiously, in the case of the *Jingwei* bird carrying branches from Western China to form a seawall in the East, the myth is fanciful yet also conveys an important truth: that the floods came from the ocean, not from rainfall or rivers. In turn, this means that the correct interpretation of hundreds of myths from around the world can

help us better understand Chinese history. Students of history have no choice but to grapple with each myth in turn, seeking to determine what truth it might contain, if any.

Third, this discussion has implications for present-day climate change.

- The Chinese evidence contributes to the study of Catastrophe-Induced Climate Change (CICC), a third cause of climate change along with natural variation and anthropogenic change. Here we must distinguish effects directly caused by natural forces from effects entrained by the climate change caused by the catastrophes. We must also ask whether the great mass extinctions of paleohistory, while on a grander scale, shared important traits with the Bronze Age catastrophes.
- The flood myths yield a less-than-benign picture of adaptation: governments were blamed for events that were not in their power to ward off; various rulers tried to shift blame to enemies and scapegoats; usurpers and rebels sought to justify overthrowing governments by arguing that they had lost the Mandate of Heaven; initial efforts to cope failed (nine years of unsuccessful floodwater removal); collapse of the social order led to criminality and class or ethnic warfare; many humans were sacrificed; loss of skills and culture was horrendous; and in extreme cases (Liangzhu) an entire culture disappeared. Still, the floods, if not the earthquakes and volcanic eruptions, obliged governments and peoples to change and adopt new approaches, so they can be seen as a key factor in the development from tribal society to the state. They also presumably influenced the development of agriculture, the crafts, and everyday life in ways that are not easy to specify yet are suggested by myth.
- We need to distinguish between CICC caused by inversions and present-day anthropogenic climate change. Unfortunately, the effects of repeated inversions and of sub-inversional yet significant latitudinal changes (the Gong Gong myth!) greatly add to the complexity of the Chinese evidence. Also, differentiating the influence of changed temperatures and wind and ocean current patterns in both inversions and sub-inversions from the influence of the catastrophic tsunamis, earthquakes, and volcanic eruptions poses a daunting task. Simply thinking through what it must have been like to change from an upright world to an inverted one constitutes a brain-teasing intellectual game. For example, during an inverted state, the Northern Pacific Gyre would presumably present itself as a cold current moving south along the coast of Northeast Asia past Japan

and Korea toward China, in contrast to the warm current of today that comes from the south. In what ways would that alter the climate, and can we find pertinent evidence?

Fourth, we are left with a challenging research agenda.

Clearly, the first step is to translate Velikovsky's *Worlds in Collision* into Chinese.⁵¹ Then we need to comb through the written records of ancient China from the perspective of Venus-induced catastrophes. So, too, we need to search for evidence in archaeology, climate studies, landscape science, iconography, linguistics, and planetary science. Lastly, we need to integrate the Chinese findings into the scholarly literature on the Bronze Age catastrophes, use them to correct various errors in science and history, and derive from them insights into present and future climate change.

⁵¹ For post-Velikovsky evidence and reinterpretation, see <http://www.scientiapress.com/jupiter-venus-and-velikovsky> and the links therein.