

## Field trip in Shandong

### 1, Zhu Cheng:

Dinosaur Museum(80RMB), Cretaceous Dinosaur Geopark(100RMB), 20% off for more than 20 tickets once.

Zhucheng located in the south of Shandong Peninsula, a small terrestrial Mesozoic sedimentary basins, is world-renowned dinosaur town. Here buried many kinds of fossils, such as hadrosaur, Protoceratops, Tyrannosaurus Rex, fishes, terrapin, crocodiles, and trees fossils.

Zhucheng dinosaur excavation began in the first autumn of 1964, which lasted 3 years, found 30 tons of dinosaur fossil, including the "Shandong giant dragon" stood 8m tall and 15m long (fig 1).



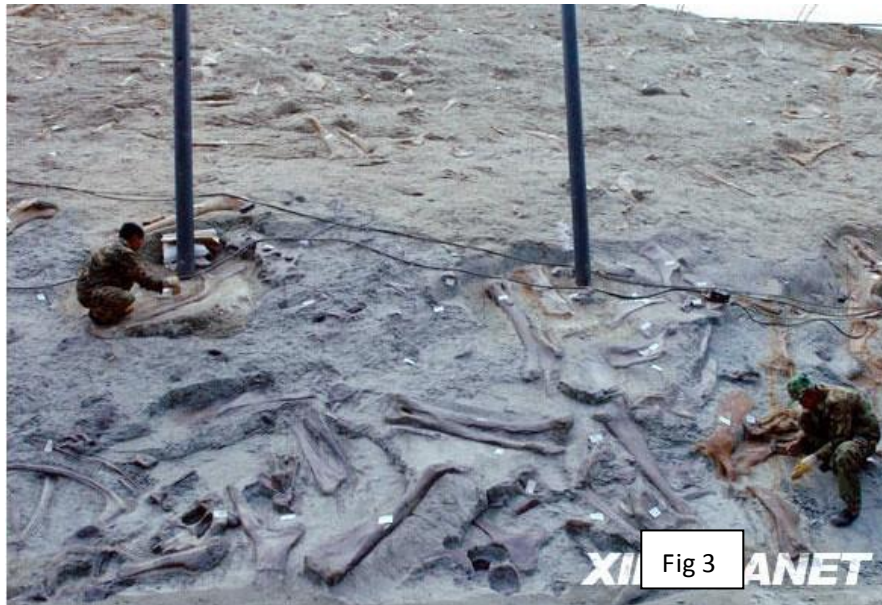
The second excavation was from 1989 to 1991, found "Gigantic Zhucheng Dragon"(fig 2), which is the world's tallest hadrosaur skeleton, 9.1 m high and 16.6 m long, is now on display in the Zhucheng Dinosaur Museum.



Scientific expedition team started the third large-scale scientific excavation since 2008.

The world's largest exposed area of dinosaur fossils: 23,000m<sup>2</sup> , unearthed over 20,000 pieces of dinosaur fossils, found two geological sites: a

"dinosaur fossil gallery," and a "uplift of dinosaur fossils"(fig 3). The dinosaur fossil gallery is 500m long, more than 30m deep, exposing more than 10,000 pieces of dinosaur fossils; the dinosaur fossils uplift is 300m long, 20m wide, exposing more than 3000 pieces of dinosaur fossils. They are both in the Cretaceous Dinosaur Geopark. A "dinosaur fossils stacked zone" found in Zangjia Zhuang, there more than 3,000 pieces of dinosaur fossils are scattered, layered and magnificent. Experts confirmed that the three geological sites of dinosaur fossils constitute the world's largest exposed area of dinosaur fossils.



Dinosaur Footprints(fig 4,5) from Huanglong Valley is amazing. The dense found area has been found up to now is more than 60m from east to west, 80m from north to south and 15m in vertical depth. The total number of dinosaur footprints is over 11,000, but not open to the public now.



## 2, Lin Yi

Two geological sites, one is Yi Shui, the other is Ping Yi.

**Yi Shui:** Underground grand canyon(60RMB) and Underground fluorescent lake(68RMB) , coupon for the two places is 108RMB

Underground grand canyon(fig 6), developed from a huge karst fracture from northwest to southeast, 6.1km long. It is a typical limestone distribution area. There is a long and tortuous underground river, which is developed into a drift 1km long, known as No.1 karst cave drift in China(fig 7). It formed about 0.65 million years to 2.3 billion years ago.



Fig 6

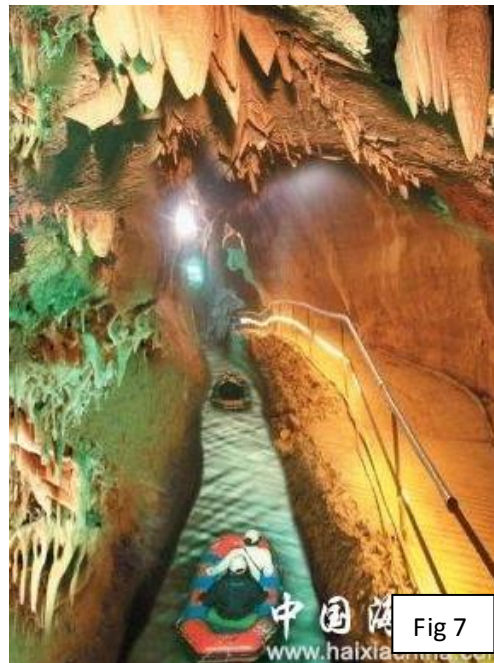


Fig 7

Underground fluorescent lake(fig 8), 25000m<sup>2</sup>, lava stalactite, wonderful stones and other spectacular landscapes, with lots of fireflies which only live in the dark and damp caves, the same age as underground grand canyon.

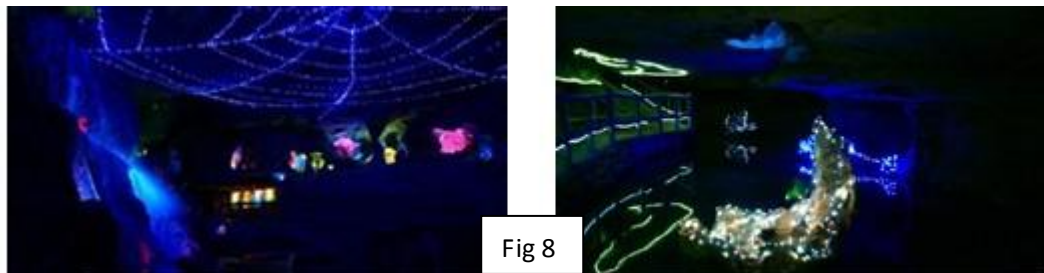


Fig 8

## Pin Yi

Gold Geopark(fig 9),

1, Baokeng, belongs to Guilaizhuang Gold Mine, a surface deposit, concealed explosive breccia type of gold deposits.



Various types of gold ore clusters gather among or around copper and alkaline potassic subvolcanic rock mass, which builds the framework of metallogenic model. Guilaizhuang Gold deposit is rich in precious metal, and it is quartz - fluorite - adularia type epithermal gold deposit.

2, Industrial square, to know mineral techniques and its development in China, Direct access to the mining field from the concentrating scenic area.

There is a safe and convenient tour access in the workplace, enabling visitors to watch the producing operation scene, and to understand the whole beneficiation process to satisfy the curiosity of tourists.

3, Space-time tunnel, be transformed from underpit shafts and tunnels.

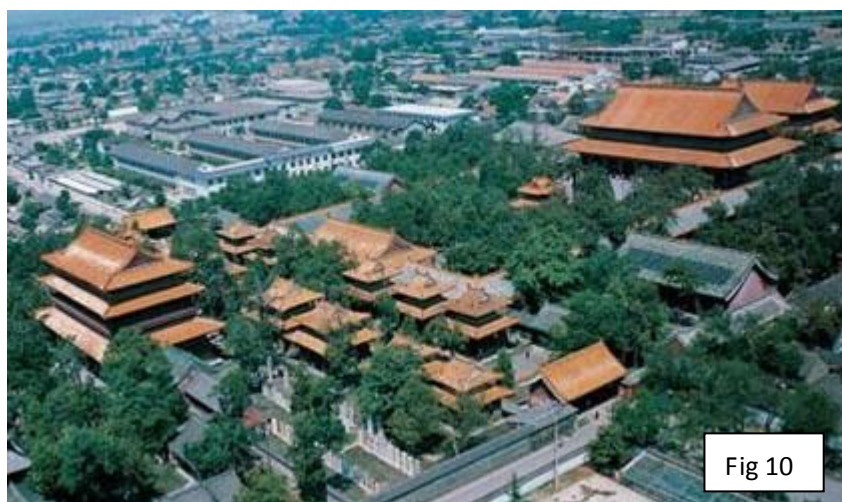
4, Original rock wall, observe original tectonic setting.

### 3, Qu Fu

Confucius Temple (90RMB), Kong family Mansion(60RMB), Cemetery of Confucius(40RMB) ,coupon for the three places is 150RMB

Confucius Temple (fig 10)

Confucius Temple is an embodiment of Confucian culture in architecture. For over 2,000 years, this temple has gradually evolved into its current magnificence and size and serves as the blueprint for all other Confucian temples. Confucius Temple is a group of grand buildings built in oriental style. Together with the Summer Palace in Beijing and the Mountain Resort of Chengde, the Temple



of Confucius in Qufu is one of the three largest ancient architectural complexes in China. At the Temple, when surrounded by the stately halls, elegant pavilions, dignified memorial archway, and classical courtyard, every tourist will gain an insight into the life of Confucius and his role in Chinese culture.

#### The Cemetery of Confucius

The Cemetery of Confucius lies to the north of the town of Qufu, the oldest graves found in this location date back to the Zhou Dynasty. The original tomb erected here in memory of Confucius on the bank of the Sishui River had the shape of an axe. In addition, it had a brick platform for sacrifices. The present-day tomb is a cone-shaped hill. When it was opened by Red Guards during the Cultural Revolution no human remains were found in it. Tombs for the descendants of Confucius and additional stela to commemorate him were soon added around Confucius' tomb. Since Confucius' descendants were conferred noble titles and were given imperial princesses as wives, many of the tombs in the cemetery show the status symbols of noblemen.

#### Kong family mansion

The descendants of Confucius lived in the Kong family mansion located to the east of the temple. They were in charge of tending to the temple and cemetery. In particular, they were in charge of conducting elaborate religious ceremonies on occasions such as plantings, harvests, honoring the dead, and birthdays. The Kong family was in control of the largest private rural estate in China. Today, the mansion comprises 152 buildings with 480 rooms, which cover an area of 12,470m<sup>2</sup>. The family mansion was inhabited by descendants of Confucius until 1937, when Confucius' descendant in the 76th generation fled to Taiwan.

## 4, Tai An

### Mount Tai(125RMB)

Mount Tai(fig 11), is located in the middle of Shandong Province, with a total area of 426 km<sup>2</sup>. As the highest peak in Shandong with an elevation of 1,545 meters, Mt. Tai is called "Chief of the Five Sacred Mountains" and "First Mountain Under Heaven."

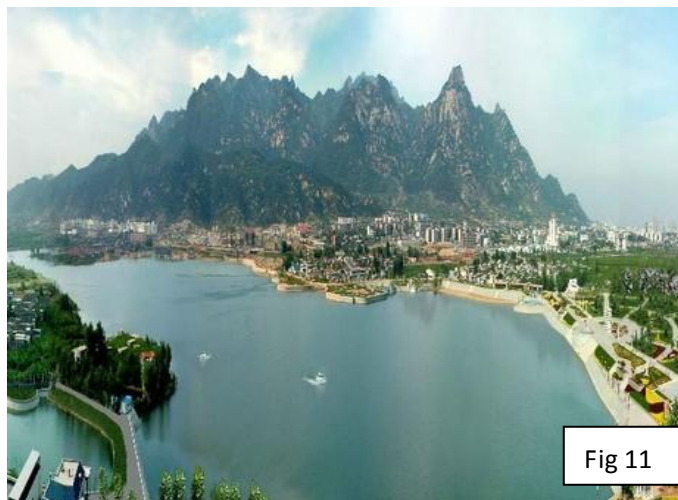
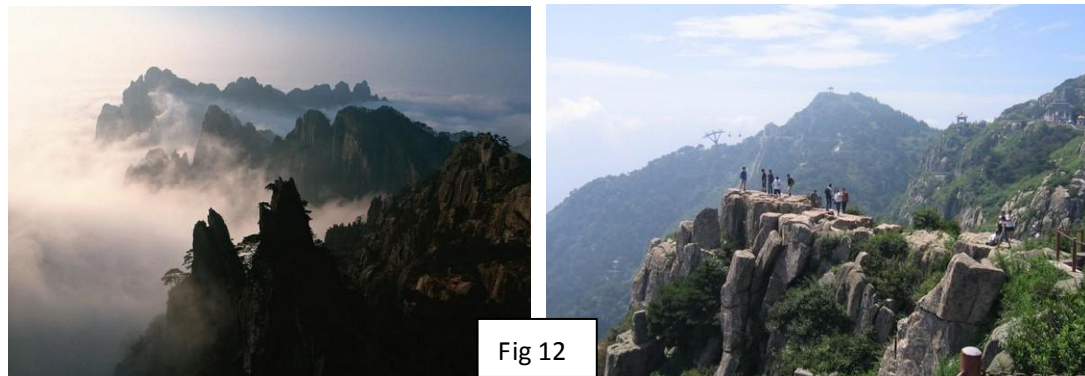


Fig 11

With its abundant cultural treasures, Mt. Tai (fig 12) is honored as a sacred mountain and the symbol of Chinese national spirit. From ancient times to the Qing Dynasty, emperors came to this reverend peak to hold grand ceremonies to worship the Gods of Heaven and earth.

Experts of the World Heritage Committee of UNESCO said, "Mt. Tai uniquely unites nature and culture together, and this means China has contributed a special heritage to the world."

In 1987, Mt. Tai was listed as both a world natural and cultural heritage by UNESCO. It was the first place named as double heritage to the world.



It formed in the Archean due to the extrusion pressure from both southwest and northeast, fold uplift, increasing with a speed of 0.5 mm per year. Rocks have experienced metamorphism.

Taishan Group as one of the most ancient strata in China, formed 2.8-2.9 billion years ago, early new Archean. The protolith is komatiite- greenstone construction composed of ultramafic, mafic volcanic rocks and volcanic tuff. They are mainly in two forms, the original layer and remnants inclusion of intrusive rocks.

The Cambrian section located at Zhangxia, in the north of Mount Tai, was formally identified as standard Cambrian strata on the North China platform in 1959 after 20 years research. It is the origin and naming places of many trilobite fossils. It is the representative profile of early Paleozoic in crustal evolution history and paleontological record in North China.

The early Precambrian intrusive rocks are widely distributed, accounting for 95% of the main body of Mt. Tai, and are extremely important geological bodies of Mt. Tai. Tonalite, adamellite and diorite are main rock types.

Longwan Geopark(fig 13), (50RMB)

Belong to Culai Mountain, sister of Mount Tai, 30km to the southeast of Mount Tai.

Main geological phenomena:  
 Granite of all shapes and sizes,  
 trace of geologic hazards,  
 Neoproterozoic Fuping  
 group gneissoid tonalite,  
 gneissoid trondhjemite and other TTG  
 composition.

Typical stratotype section of Archean  
 Greenstone Belt - Taishan lithologic  
 group Dashangou lithologic formation.



## 5, Ji Nan

Baotu Spring(40RMB)

If we don't have enough time, this site can be ignored.

Gush of 70,000 m<sup>3</sup> spring per day

JiNan, on the border of mountain area (South) and plains (north), the mountain area is composed of limestone, while beneath the soil of plains are hidden igneous rock covered by a impermeable clay layer. Groundwater flow goes north-south, and finally can not be free to the ground. A large number of groundwater with a strong pressure wells up from cracks in the ground to form the famous springs. The most famous one is Baotu.

Other springs nearby and other places of historic interest, like architectures in Song Dynasty

### Time schedule

Date	Location	Geological context
2 <sup>rd</sup> Aug.	Zhucheng	Zhucheng: dinosaur museum
3 <sup>th</sup> Aug.	Lin Yi	
Arriving in the morning on 2 <sup>rd</sup>	(2,3)	Yi Shui: (coupon for the two places is 108RMB)
Leaving in the morning on 4th for Qufu	(2 nights)	Underground grand canyon(60RMB), developed from a huge karst fracture, 6.1km, No.1 karst cave drift in China(1km)
		Underground fluorescent lake(68RMB), 25000m <sup>2</sup> , lava stalactite, wonderful stones and other spectacular landscapes, with lots of fireflies which only live in the dark and damp caves.
		Ping Yi: Gold Geopark

		<p>1, Baokeng, belongs to Guilaizhuang Gold Mine, a surface deposit, concealed explosive breccia type of gold deposits.</p> <p>2, Industrial square, to know mineral techniques and its development in China</p> <p>3, Space-time tunnel, be transformed from a shaft</p> <p>4, Original rock wall, observe original tectonic setting</p> <p>.....</p>
4 <sup>th</sup> Aug. Day drive to Taian in the evening	Qu Fu	Confucius Temple (90RMB), Kong family Mansion (60RMB), Cemetery of Confucius(40RMB) coupon for the three places is 150RMB
5 <sup>th</sup> Aug. 6 <sup>th</sup> Aug. Arriving in the evening on 4 <sup>th</sup> Leaving in the morning on 7 <sup>th</sup>	Tai An (5,6) spent 3 nights	<p>Mount Tai(125RMB)</p> <p>Formed in the Archean, due to the extrusion pressure from both southwest and northeast, fold uplift China's most ancient stratum ——Taishan Group by metamorphism, increasing with a speed of 0.5 mm per year.</p> <p>Longwan Geopark, (50RMB)</p> <p>Belong to Culai Mountain, sister of Mount Tai, 30km to the southeast of Mount Tai</p> <p>Granite of all shapes and sizes, trace of geologic hazards</p> <p>Typical stratotype section of Archean Greenstone Belt - Taishan lithologic group Dashangou lithologic formation.</p> <p>Neoarchean Fuping group gneissoid tonalite, gneissoid trondhjemite and other TTG composition.</p>
7 <sup>th</sup> Aug. Going to Beijing in the evening on 7 <sup>th</sup>	Ji Nan (7)	<p>Baotu Spring(40RMB)</p> <p>Gush of 70,000 m<sup>3</sup> spring per day</p> <p>JiNan, on the border of mountain area (South) and plains (north), the mountain area is composed of limestone, while beneath the soil of plains are hidden igneous rock covered by a impermeable clay layer. Groundwater flow goes north-south, and finally can not be free to the ground. A large number of groundwater with a strong pressure wells up from cracks in the ground to form the famous springs. The most famous one is Baotu.</p> <p>Other springs nearby and other places of historic interest, like architectures in Song Dynasty</p>