

Danxia Landform

丹霞地貌



Danxia landscape

- Refers to a special petrological geomorphology found worldwide in 1,200 sites and named in the 1920s after Mount Danxia 丹霞山 in Guangdong by Chinese Geologist 馮有蘭 as the features there are most typical
- The term applies to a landscape formed from thick continental Red Beds that have been uplifted, intensely faulted and then deeply dissected by fluvial erosion and weathering producing a variety of cliff bounded peaks surrounded by deep canyons and dotted with rock pillars, bridges, arches and caves
- That the rocks are red is because the iron content released from the sediment exposed to semi-arid climate was oxidized into hematite (Fe_2O_3)

Danxia landscape

- The red beds are terrestrial red clastic rock 碎屑沈積岩 comprising mainly of sandstone 砂岩 & conglomerates 礫岩 hundreds of meter thick accumulated during the Jurassic 侏羅紀 to Tertiary Period 第三紀 which were then subject to erosion forming spectacular landforms some of which resemble Karst topography so it is also known as "Pseudo Karst"



Danxia landscape

- In China there are some 780 Danxia landforms concentrated in seven main sites located in the Southeast, Southwest and Northwest of the country. As each region has it's own environmental condition varying from tropical to arid and high altitude, the resulting features are quite different. Simply speaking water erosion plays a major role in the south whereas wind erosion is more important in the west



Danxia landscape 丹霞地貌

The major sites in China include :

- Danxia Shan 丹霞山 in Guangdong
- Taining 泰陵 in Fujian
- Langshan 諒山 in Hunan
- Longhushan 六湖山 in Jiangxi
- Jianglangshan 江郎山 in Zhejiang
- Chishui 赤水 in Guizhou
- Zhangye 張掖 in Gansu

Danxia Shan : Shaoguan 韶關, Guangdong

Occupying an area of 290 sq.km, Danxiashan has been named an UNESCO Geopark and also a world heritage site since 30.08.2010. Geologically it is considered to be a Matured Danxia Landform classified as the Peakhoodoo-cluster-type which includes many special features



Danxia Shan : Shaoguan 韶關, Guangdong

Special features :

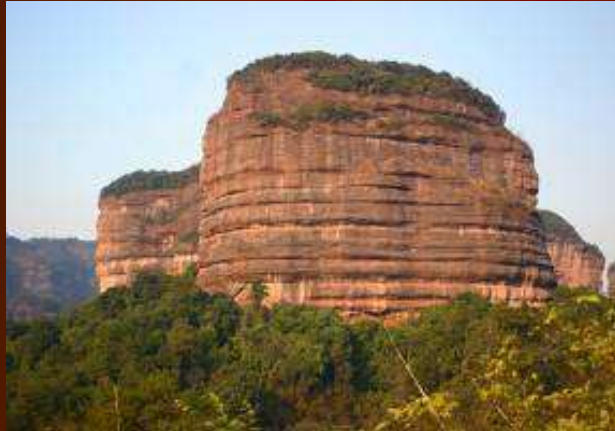
- 380 Peaks all with steep cliffs between 55 to 90 degrees. Highest one being Bazhi Peak 巴塞 at 618 m ,others between 300 to 400m. The peaks can be pyramidal, in the form of mesa or cuesta

Pyramidal peaks



Danxia Shan : Shaoguan 韶關, Guangdong

Mesa peaks



Cuesta peaks



- Vertical Groove like Cliff



- Nich-like-Cliff



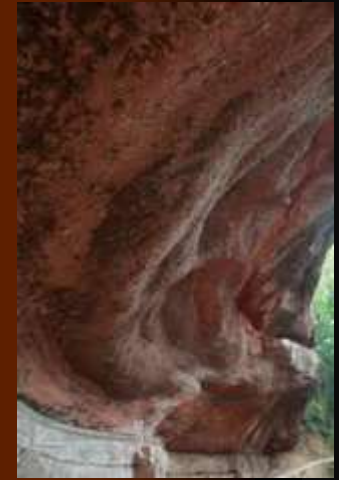
- Stone pillars eg the Yangyuan Pillar 陽元石



- Lane Valley & incised meandering Valley of Jinjiang 錦江



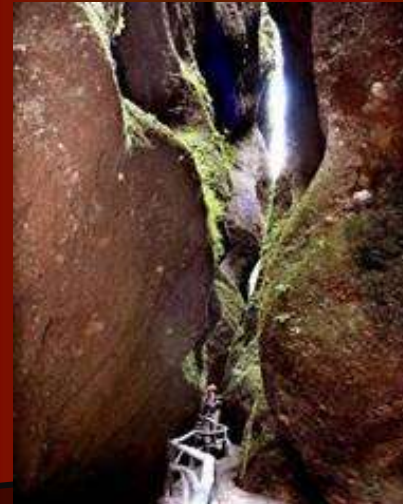
- Caves : Horizontal Caves



- Honeycomb like or Perforated caves eg. Yingyuan Cave 陰元石



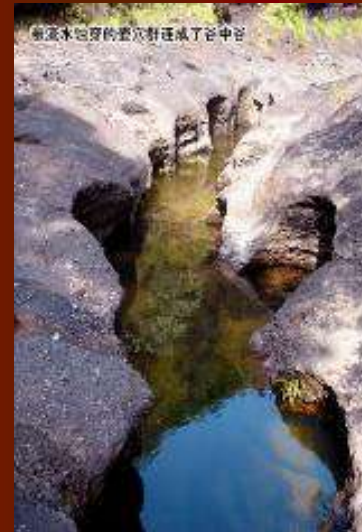
- Narrow Ravines



- Stone arches



- Potholes



級高水位的壘穴對連成了谷中谷

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- Fluvial erosion



Danxia Shan: Shaoguan, Guangdong

- The Danxiashan landscape today was formed some 100 million years ago in the huge Shaoguan Basin where silt from the surrounding mountains were carried down and accumulated which eventually turned into sandstone and conglomerate. Later due to global high temperature, the basin dried up and the sediment was oxidized and turned rust color.
- By the Cretaceous Period some 70 million years ago a 3,700 m thick deposits was accumulated in the basin. This is made up of two different formations. The lower Changba Formation which is 2,400 m thick is composed of softer mudstone & silt stone forming more rounded & subdued slopes. The upper 1,300 m thick Danxia Formation is purple red in color & composed of

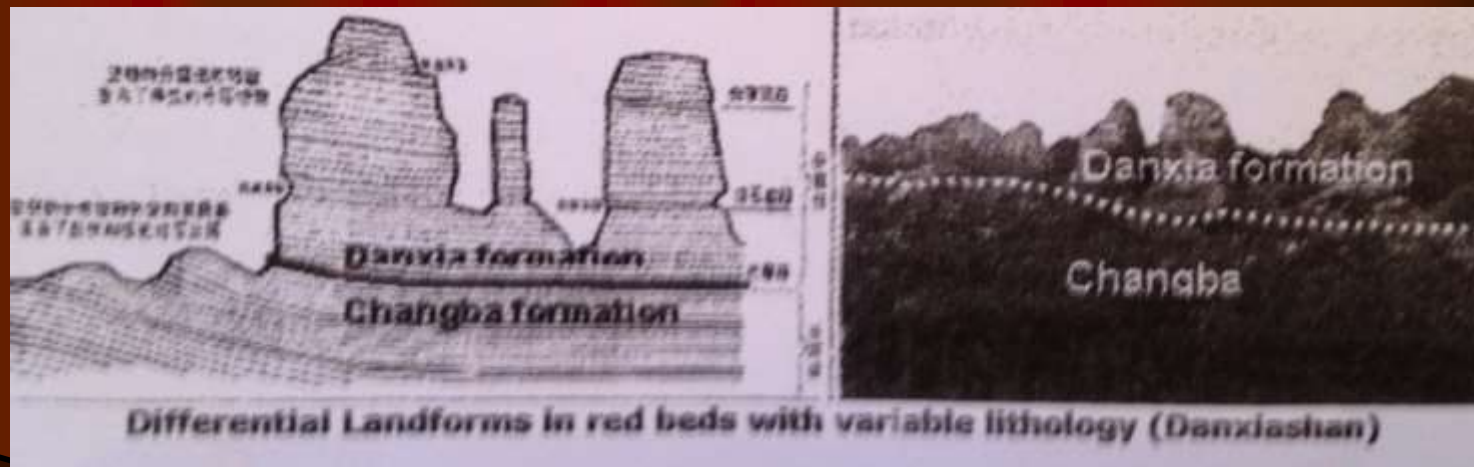
harder conglomerate, siltstone and grit stone which are more massively bedded and more resistant to erosion thus forming the basis of a highly angular landscape

- Then around 30 million years ago the whole basin was subject to uplifting many times by *orogenic movement. In fact this is still ongoing at an average rate of 0.87 m every 10,000 years over the last 500,000 years. Meantime water flowing down the fissures cut through the rock and created the spectacular features we are seeing today.

* orogenic movement : large structural deformation to the lithosphere due to tectonic movement

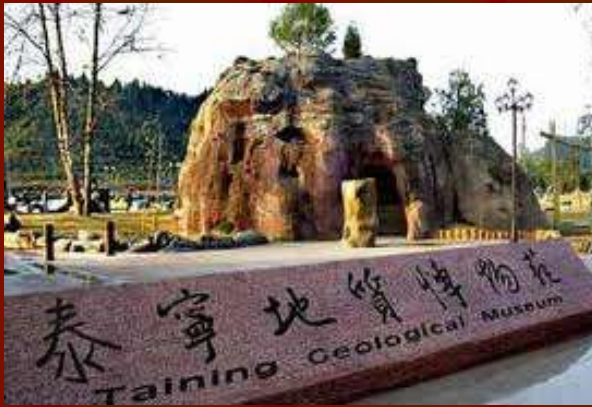
Danxiashan 丹霞山

Mature example with deep & narrow valleys

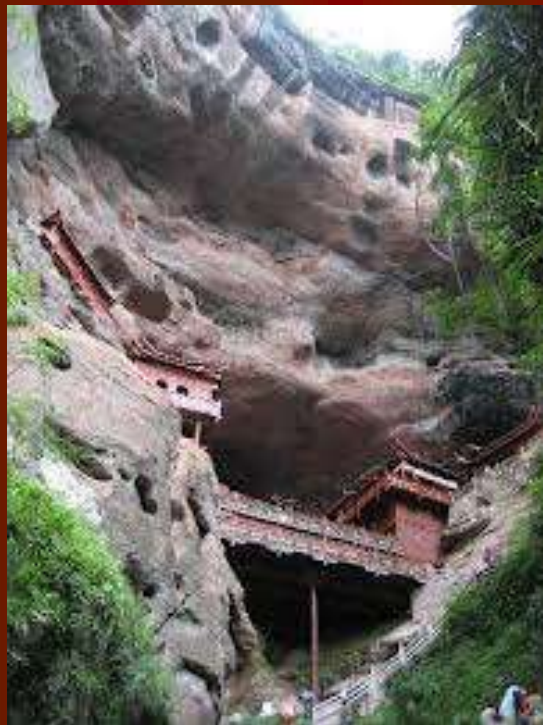


Taining Danxia in Fujian 福建泰寧

“Young Danxia” with deeply incised river meanders in a mountain & plateau landscape with cliffs & caves of varying origin & formation

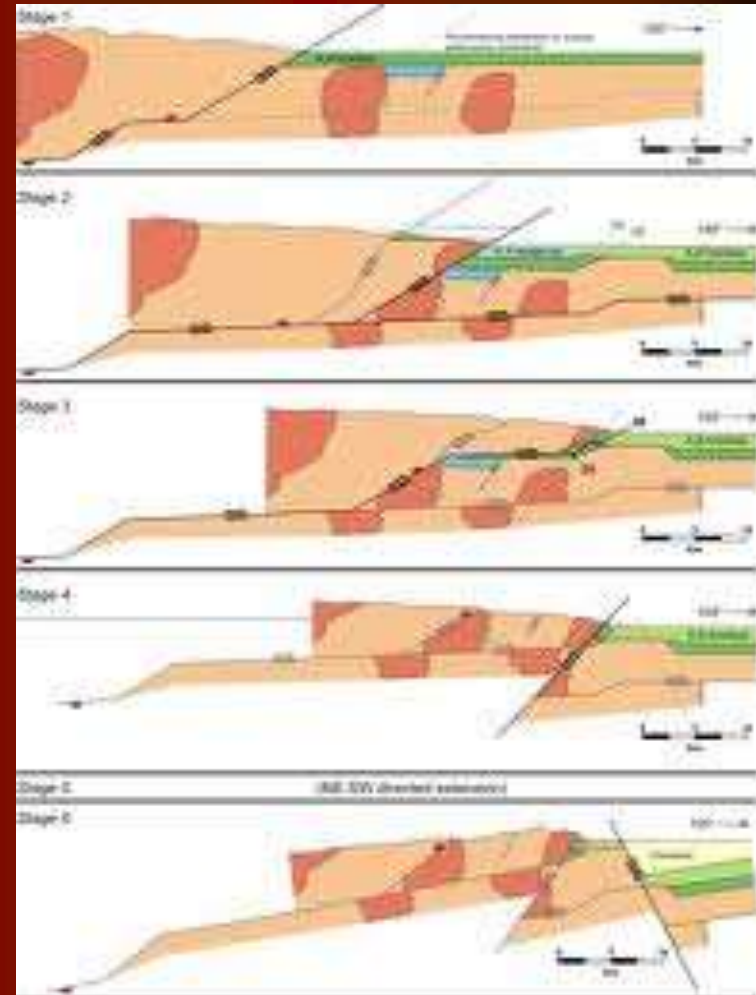


Taining Danxia in Fujian 福建泰寧 “Young Danxia”



Langshan Danxia in Hunan 湖南諒山

“Matured Danxia” with peak cluster or peak forest composing of conglomerate domes & needles



Longhushan in Jiangxi 江西龍虎山

“Old Stage” with scattered peaks separated by lower altitude areas



Jianglangshan in Zhejiang 浙江江郎山

“Old Stage” with prominent isolated conglomerate Domes, Mesa & Butt surrounded by lower terrain



Chishui in Guizhou 赤水, 貴州

“Young stage” plateau Canyon landform with intensive uplift & deep incisions, Note the honeycomb like caves



Zhangyi in Gansu 張掖,甘肅 Wind eroded Danxia



Zhangyi Danxia at Gansu



Zhangyi Danxia 張掖 at Gansu 甘肅



Zhangyi Danxia 張掖 at Gansu 甘肅



Danxia in Guangdong

Of all the locations, Red Bed basins in Guangdong Province are most extensive. Apart from Mount Danxia, we can also find Red Beds in HK at Pat Sin Lang, Port Island, Kat O & Ping Chau



Pat Sin Lang Formation 八仙嶺組

Consisted of reddish brown conglomerate, greyish red sandstone & reddish purple siltstone



Kat O Formation

Formed in late Cretaceous (100 Ma) & found in Crooked Island 吉澳 & Ap Chau. Composing of calcareous breccia with conglomerate, & coarse grained sandstone. The formation is estimated to be at least 100 m thick overlying on ash tuff of the Ngo Mei Chau Formation



Ap Chau (Robinson Island)

- Kat O Formation is more easily seen in Ap Chau 鴨洲 which was formed as seasonal flood bringing down gravel and silt to the Ap Chau depositional basin & eventually consolidated to form the reddish brown breccia we see today

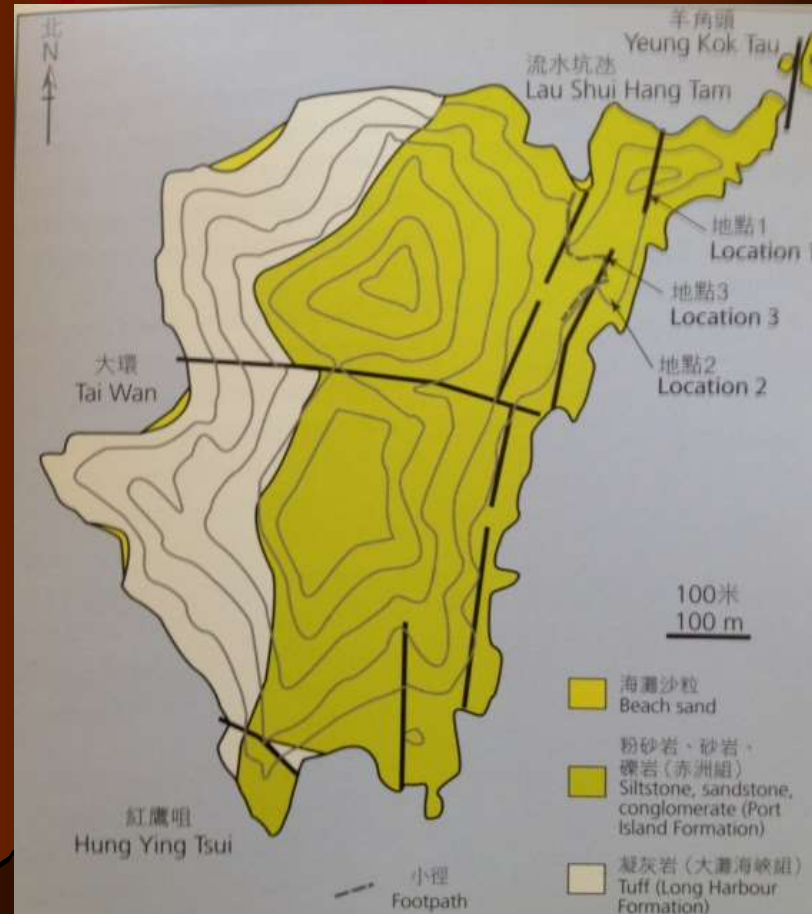


The Duck's Eye – a natural sea arch in Ap Chau



Port Island 赤洲

1/3 grey volcanic tuft, 2/3 red sedimentary
formed in Early Cretaceous (140 Mya) consists of reddish
brown thickly bedded sandstones & conglomerates
interbedded with siltstones



Port Island 赤洲 sandstone

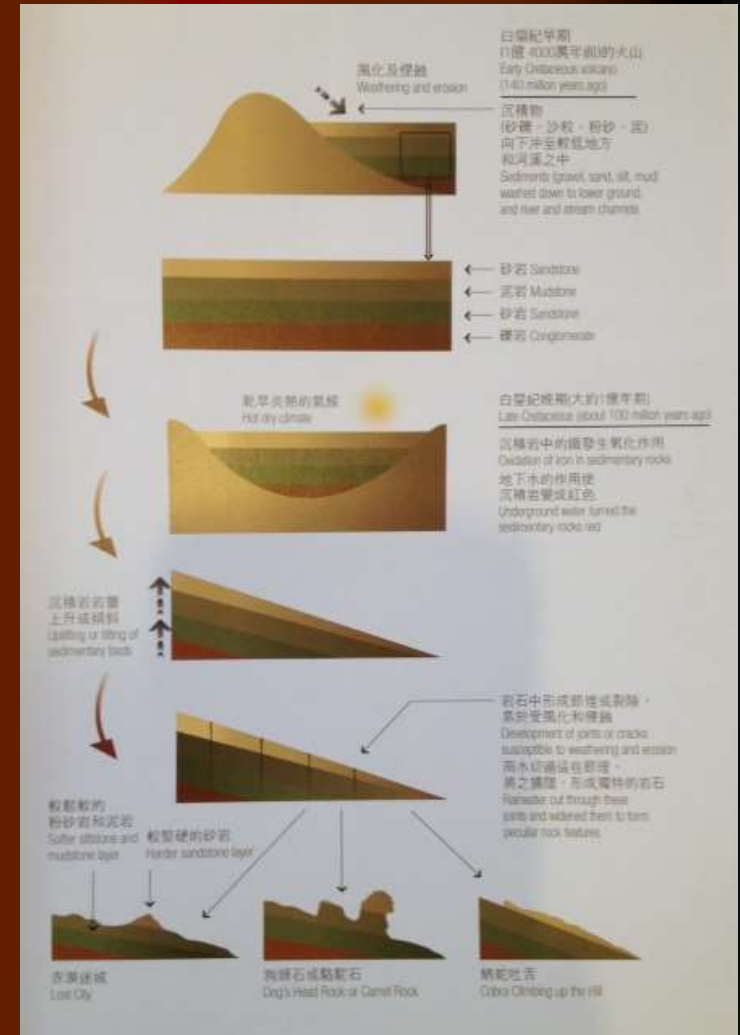
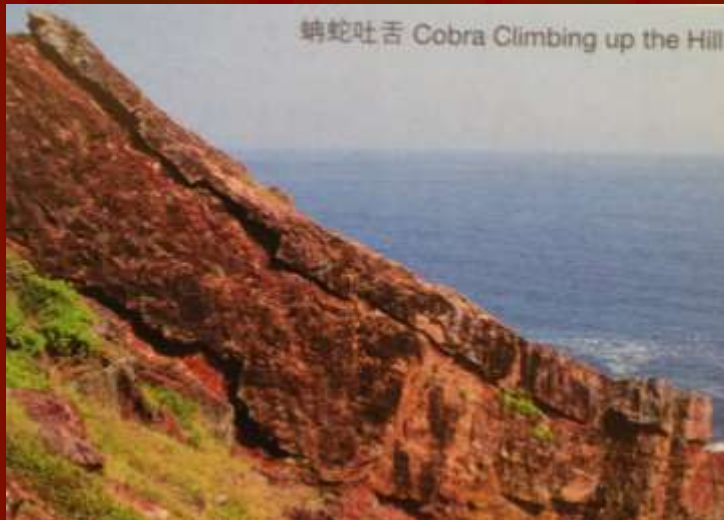


Port Island Formation note the location of the fault

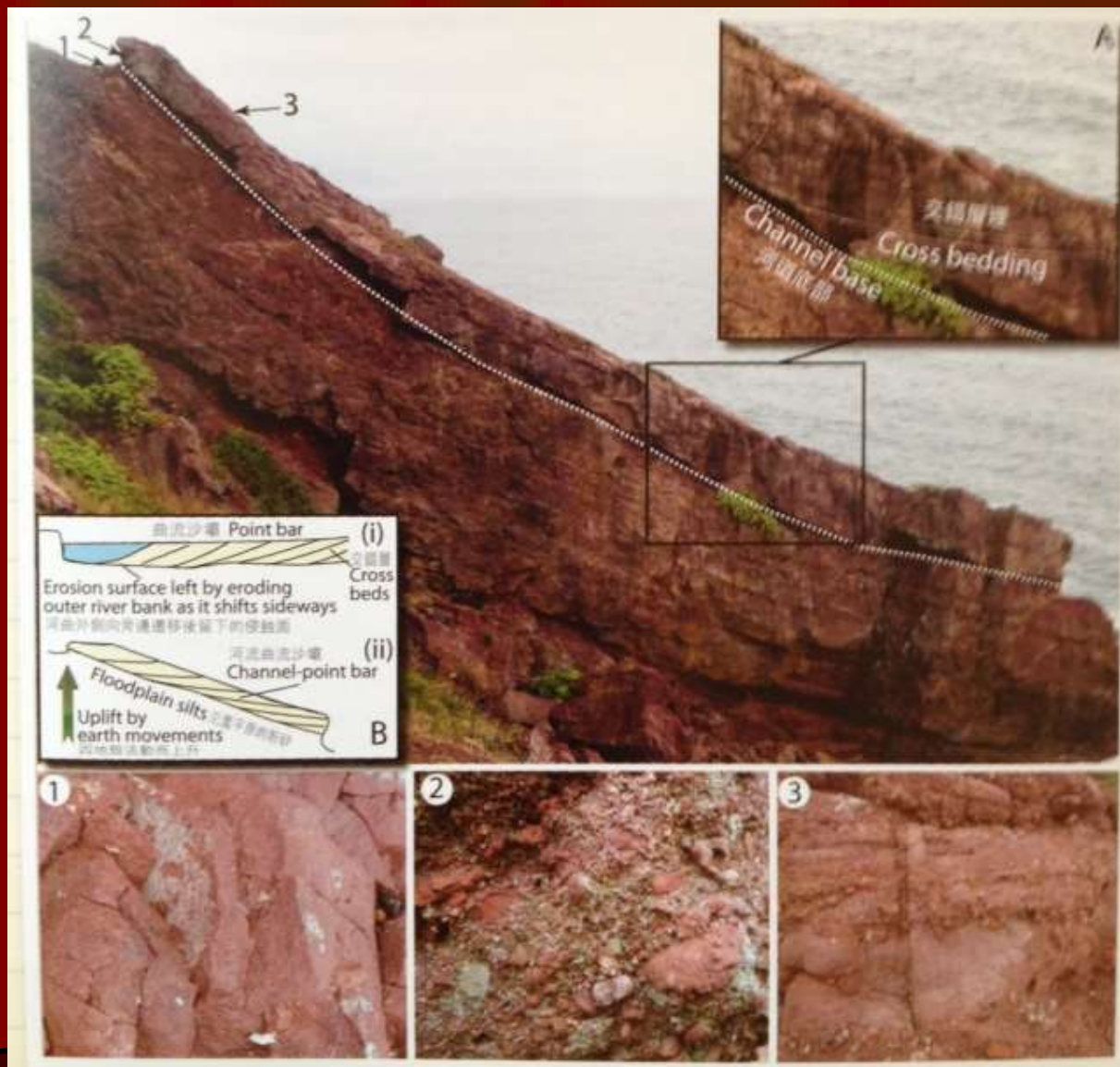


Port Island Formation

Cobra Rock 蚺蛇吐舌 & Dog's Head Rock 狗頭石



Cobra Rock 蝮蛇吐舌



The End