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THE MAIN CHARACTERISTICS OF THE GEOLOGIC STRUCTURE OF CHINA: PRELIMINARY CONCLUSIONS

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I. Geotectonic Subdivisions of China and their Main Characteristics

China is subdivided into:

The Chinese Platform

- Northeastern Paraplatform
- Sino-Korean Paraplatform
- Yangtze Paraplatform
- South China Paraplatform

Western folded regions

- Tienshan-Mongolian Fold-System
  - Altai Fold-System
  - Tienshan Fold-System
  - Inner-Mongolian-Great Khingan Fold-System
- Tarim Massif
- Kunluen-Tsinling Fold-System
  - Kunluen Fold-System
  - Nanshan Fold-System
  - Tsinling Fold-System
  - Sungpan-Kantze Fold-System
- Tibet-W. Yunnan Paraplatform
  - Tibetan Paraplatform
  - W. Yunnan Fold-Fracture System
- Himalayan Fold-System
- Taiwan Fold-System

1. The Sino-Korean Paraplatform Consists of a more or less well-consolidated. Pre Sinian crystalline foundation and amoderately disturbed blanket partly of marine Paleozoic and partly of continental Mesozoic sediments. It is subdivided into the following units of second order:

1. The Alashan Uplift Region (Alashan Massif)
2. The Inner Mongolian Axis
3. The Ordos Meso-depression Region
4. The Fold-fracture Belt of the Western Border of Ordos
5. The Shansi Meso-Uplift Region
6. The Yenshan Fold Belt
7. The Liastung Uplift Region
8. The East-Shantung Uplift Region
9. The West-Shantung Uplift Region
10. The North-China Depression Region

11. The Tsinling Axis
12. The Huaiyang Shield
13. The West-Honan Fold-fracture Belt

2. The Yangtze Paraplatform Consists of a less well-consolidated Pre-Sinian crystalline foundation and a rather thick, moderately to strongly disturbed blanket chiefly of marine Paleozoic limestones. It is subdivided into:

1. The Kam-Yunnan Axis
2. The Yunnan-Kueichow Fold-fracture Region
3. The Depression Fold-fracture Belt of the northern border of the Paraplatform
4. The Szechuan Meso-Depression Region
5. The Pamienshan Fold Belt
6. The Kiang-Han Ceno-Depression Region
7. The Lower Yangtze Fold Belt
8. The North-Kiangsu Depression Region

3. The South-China Paraplatform It consists of a poorly consolidated foundation of Caledonian folds in which Proterozoic sediments, and a thick blanket of Devonian to Triassic marine limestones, sandstones and shales are also involved. The blanket is again folded quite strongly both at the end of Triassic and in Jura-Cretaceous times. It is subdivided into:

1. The Kiangnan Axis (Chiangnania)
2. The Kuei-Hsiang-Kan Fold Belt
3. The Cathaysian Fold Belt (Cathaysia)
4. The Yukiang Fracture-fold Region

4. The North-Eastern Paraplatform It consists of a Pre-Sinian crystalline foundation and a blanket of Upper Paleozoic sediments of Parageosynclinal type, which are again partly covered by continental Mesozoic after the Variscan orogeny. It is subdivided into:

1. The Sungliao Meso-Depression Region
2. The Little Khingan-Changkuangtsai Granite Belt
3. The Kirin Fold Belt
4. The Yenpien Fold Belt
5. The Chiamusze Duplicate Uplift
6. The Tungchiang Ceno-Depression
7. The Natanhatas Fold Belt

5. The Tienshan-Mongolian Geosynclinal Fold System This includes all the Paleozoic geosynclinal folds north of the Tarim Massif and the Chinese Platform and is subdivided into:

1. The Altai Fold-System
2. The Tzungarian Betwixt-Massif
3. The Tienshan Fold-System
4. Inner Mongolian-Great Khingan Fold-System

6. The Tarim Massif

7. The Kunlun-Tsinling Geosynclinal Fold-System This includes all the Paleozoic geosynclinal folds south of the Tarim Massif and south-west of the Chinese Platform, and is subdivided into:

1. The Kunlun Fold-System
2. The Nanshan Fold-System

3. The Tsaidam Betwixt-Massif
4. The Tsinling Fold-System
5. The Sungpan-Kantze Fold-System

8. The Tibet-W. Yunnan Paraplatform This consists of two parts: Tibet and W. Yunnan. The former is considered as a young platform with poorly consolidated Variscan folds as foundation and fold-faulted Permo-Mesozoic shallow marine sediments as blanket, while the latter is made up of subparallel N-S striking folds of Variscan-Indosinian-Yenshanian ages, with Variscan-Indosinian dominating, tht blanket is partial and thin, mostly late Mesozoic red beds. W. Yunnan consists of the following (from W. to E.):

(a) The Kumenling Crystalline belt
(b) The Tengchung Fold Zone
(c) The Paoshan Fold Zone
(d) The Kungshan Fold Zone
(e) The Lantsangchiang Fold Zone (The Mekong Fold Zone)
(f) The Lanping-Szumao Meso-Depression
(g) The Tali-Lichiang Fold Zone
(h) The Chinping Mochiang Fold Zone
(i) The Ailaoshan Projection

9. The Himalayan Fold-System

10. The Taiwan Fold-System

II. The Main Characteristics of the Geologic Structure

1. The Indosinian Cycle of Movements

Late Triassic oroganic movements or "Indosinian cycle of movements were independently discovered both in China and in Indo-China. In the last few years detailed mapping in Hunan, Kuangtung and Kuangsi not only confirmed the wide-spread occurrence of the Indosinian cycle but also revealed its great significance. The oroganic cycle may be tabulated below:

Geologicalage	Oroganic phase	Kuangsi	Kiangsi
Liassic	5th phase	Siwan Coal-bearing Series	Sanchiutien Series
Rhaetic	4th phase	Gelan Series	Anyuan Series
Noric	3rd phase	Szulo Series	?
Carnic	2nd phase	Hungkaoling Series	Tzuyingting Series
Ladinic	1st phase	Pingerkuan Series	Chehuling Series
Anisic		Poszu Series	
Scythic		Lolu Series	

2. The Yenshanian Cycle of Movements and Its Importance

The Yenshanian oroganic cycle is still more wide-spread than the Indosinian, infact it affected almost all Chinese territory including the western Paleozoic geosynclinal folds, which are polycyclically folded. True Yenshanian geosynclinal folds are however very few, only the Natanhata

Fold Belt may be recognized as such. The Yenshanian cycle may be subdivided into tne following phases:

Geologicalage	Phase	Hopeh & Shantung		Chekiang & Fukien	
Old Tertiary	5th	Kuanchang Series ?	Continental basin formation	Chüchiang Series	Red beds formation
Upper Cutaceous	4th	Wangshih Series ?	,,	Alkali shyolite ?	
Lower Cutaceous	3rd	Nantienmen Series	Molasse formation	Pautou series	Molasse formation
Upper Jurassic	2nd	Kalgan Series	Acid volcano-clastic formation	Kienteh Series	Acid volcano-clastic formation
Middle Jurassic	1st	Tiaochishan Series	Intermediate volcano-clastic formation	Juao Series	Intermediate volcano-clastic formation
Lower Jurassic		Mentoukou Series	Coal-bearing formation	Lishan Series	Coal-bearing formation

The Yenshanian cycle is also well-developed in Kuangtung where all the five phases are shown. In Szechuan, up. in the Lungmenshan region, only four phases have been noticed, the 2nd phase being represented by a movement of uplift. Closely associated with the Yenshanian are magmortic manifestations, shown both by extensive volcanic eruptions, esp. along the Pacific coastal regions, and by large scale intrusions mostly granitic in character. Granitic badies sometimes of batholithic dimension are very common near the coastal regions and also along the axes. As we go westward toward the Paleozoic geosynclinal folds, Yenshanian igneous activities decreased and gradually died out.

3. Polycyclic Orogenesis and Polycyclic Igneous Activity

Polycyclic orogenesis occurred both in the geosynclinal as well as in the platform regions. In the western geosynclines, in the Nanshan geosyncline for example, the first orageny took place in Devono-Carboniferous, or in early Variscan, time; the second orogeny, though less intense but still of "mountain-making character", took place in Jurassic-Cretaceous time, as is shown by the many unconformities within the Jurassic-Cretaceous sequence seen both along the foot of the Nanshan and in the Nanshan ranges themselves. The third orogeny belongs to the Himalayan as shown by the folding and tilting of the Tertiary piedmont sediments including the earliest Quaternary Yümen conglomerates. Similar history is recorded in the Tienshan, in the Kunlun and in the Tsinling region. In the Platform regions, in the Sino-Korean Paraplatform for example, Polycyclic movements are dinstinctly shown along the marginal portions, like the Inner. Mongolian Axis, the Tsinling Axis, the Liaotung-Shantung region, etc., where orogeny manifested itself as large scale faulting accompanied by granitic intrusions. In the South-China Paraplatform polycyclic orogenesis is esp. typical, since there Caledonian, Indosinian, Yenshanian and Himalayan cycles are well-recognized, and at some places the Variscan cycle is also seen. It is to be noted that polycyclic orogenesis is almost always accompanied by polycyclic igneous activities, not only in the geosynclinal but also in the paraplatformic regions, and it is quite natural to expect the occurrence of polycyclic metalogenesis in the respective regions.

4. Deep Faults and Great Faults

Deep faults are large-scale faults which cut very deep into the earth crust, and they often cut through the latter and sometimes even much deeper. Great faults are large-scale faults which did not cut deep into the crust, the cutting only affecting the blanket sediments.

Deep and great faults are numerous with in the Chinese territory. They may be classified as: platformic deep-faults, geosynclinal deep-faults and deep-faults of the marginal troughs. Furthermore, they may be classified as: normal faults, thrust faults and overthrusts. The age of the deep faults may be different: often they are very old, usually Pre-Cambrian; also Paleozoic, Mesozoic and Cenozoic. It is to be noticed that as a rule deep faults were active at different times; for instance a Pre-Cambrian deep-fault may become active in Variscan, Indosinian, Yenshanian and even Himalayan cycle, that is to say, deep faults are normally polycyclic. In a polycyclic group of deep faults, like the fault zone of Kunming in Yunnan, we may notice that some of them are deep, some are not, some are Paleozoic or older, some are Yenshanian, some are Himalayan, and some are even more recent. Such a complex group of faults may be termed a polycyclic deep-fault system.

5. Large Scale Uplifts and Depressions

Large scale uplifts and depressions are characteristic both for the Pre-Sinian platforms and for the young platforms (including the Paleozoic geosynclinal-folded regions). These uplifts and depressions are hardly to be found in other platforms (e.g. the Russian and the American platforms) and are therefore of great importance for the distinction between the so-called ortho- and para-platforms. These uplifts and depressions are classified as follows:

(1) Paraplatformic uplifts and depressions:
   (A) Axis uplifts and their accompanying Axis-marginal depressions
   (B) Uplift-depression bundles
   (C) Common uplifts and depressions: (a) Common uplifts, both submarine and subaerial; (b) Common depressions, mainly submarine; (c) Common depressions, mainly subaerial.
   (D) Marginal troughs: (a) marginal troughs of geosynclinal folds, (b) marginal folds of paraplatformic folds.

(2) Depressions of parageosynclinal type:
   (A) Sinian depressions of parageosynclinal type,
   (B) Upper Paleozoic depressions of parageosynclinal type,
   (C) Mesozoic depressions of parageosynclinal type.

(3) Uplifts and depressions in polycyclic fold-regions.

6. Paraplatform and Its Characteristics

The term paraplatform was coined in 1956, since then it has been applied to all the platformic units of eastern China. As is understood now, Paraplatform is distinguished from Orthoplatform (for example the Russian Platform) as follows:

Paraplatform	Orthoplatform
(1) More active, chiefly shown by oscillatory movements of great amplitude	(1) Less active oscillatory movements of small amplitude
(2) Consolidation of foundation quite low	(2) Consolidation of foundation high.
(3) Blanket sediments usually thick, 3—4000 m, or 5—6000 m or more.	(3) Blanket sediments usually thin, less than 3000 m.
(4) Large scale depressions are very deep compared with the adjoining uplifts; uplifts and depressions are linear, only the Mesozoic depressions are not so. These uplifts and depressions are diffenent from the anticlise and synclise types.	(4) Characterized by uplifts and depressions of the anticlise and synclise types; linear elements absent; Mesozoic continental depressions absent.
(5) Presence of axis and axis-marginal depressions; absence of uplift-left sides.	(5) All the structures listed on the depression bundle; sometimes presence of depression of parageosynclinal type.
(6) The existence of frue orogenesis, which is polycyclic and is accompanied by polycyclic igneous activity.	(6) True orogenesis is absent. Igneous activity unimportant, or only shown by widespread basaltic flows (tsaps).
(7) Yenshanian cycle of orogeny especidlly strong.	(7) Yenshanian cycle absent.
(8) Deep & great faults very numerons, esp. along the axes.	(8) Deep and great faults not clear; at least they did not cut the blanket.
(9) Neotectonic movements very strong, geomorphologic expression young.	(9) Neotectonic movements very weak, geomorphologic expression old.