Guangzhou-Conghua Fault Belt, 
Its Formation and Evolution

by
Yan Guozhu*

Abstract Guangzhou-Conghua Fault-Tectonic Belt is extraordinarily significant not only in its long continued activity from the early Paleozoic up to the present but also in its important role playing the number of tectonic events in the Southeast China. The effects of the repeated faulting of this belt are approved by controlling the formation of the Caledonian metamorphic rocks, that of the early Paleozoic migmatite, the distribution of the late Paleozoic strata, intrusions and eruptions of the Jurassic-Cretaceous igneous rocks and the formation of red basin as well as the formation of the Quaternary sediments, distribution of hot springs, earthquakes and the topography. These various kinds of tectonic events and phenomena related to the faulting are in accordance with three stages of tectonic movements in China, that is, Indosinian, Yanshanian and Himalayan except for those at Neotectonic stage. The dynamic aspects of the faulting is explained by alternation of compresso-shear and tensional shear, which reveal the crustal condition and its development since the early Paleozoic.

I. Introduction

Guangzhou-Conghua Fault Belt (Guang-Cong Fault Belt in short) is located at Guangzhou area of southeast China (Fig. 1). It is a middle part of Enping-Xinfeng Fault which stretches from Lianping, Xinfeng toward SW via Conghua, Guangzhou, Gaoming, Kaiping, Enping to Yangjiang (Fig. 2). From Lianping to NE direction, it extends to Dingnan, Longnan and Anyuan of Jianxi Province, and to the SW direction, it extends to Hailing Island to South China Sea. The Fault Belt reaches 600 km long and the general strike is N40°E. It dips at 40°-60° to NW in general, and locally to NE. The secondary parallel faults are well developed. It is one of the intensely active fault belts in Meso-Cenozoic time along the coastal zone of South China Sea.

The Fault Belt offsets E-W trending Gangzhou-Luofushan Fault Belt nearby the Sanyanli area. They constitute the tectonic outline of Guangzhou district. In the south of Yanbu, Nanhai county, it is cut by Chinsawan Fault, and controls the southeastern boundary of Shanbshui Basins.

The study of the basic characteristics, the formation and evolution of Guang-Cong Fault Belt has great significance for deep understanding the geological features, geohistorical development of Guangzhou area and the formation and development of NE tectonic belts in Guangdong Province and along the coastal zone of Southeast China. It also plays an important role in rational arrangement of great projects in Guangzhou area.

Tectonic trace of the Guang-Cong Fault is clear and has already attracted by people's
attention. As the former researchers only pointed out the existence and some evidences. This paper intends to analyse and clarify the active phases and periods of the Fault, transformation history of dynamics and the development of the Fault Belt since Meso-Cenozoic time.

II. Characteristics of the Guang-Cong Fault Belt

The Fault Belt plays an important role in controlling the distribution and sedimentation of all ages of strata in Guangzhou area and also in controlling the intrusion of Mesozoic magma. The basic characteristics of the Fault Belt are as follows:

1. Geology and Geological Structures around the Belt

From Sanyuanli to Shengang, it is about 50 km long. In the east of the Fault Belt, the lower Paleozoic Maofengshan and Baiyunshan metamorphic rocks are developed. The lithology is mainly composed of dark gray micafeldspar gneiss intercalated with quartzite and quartz schist, which are partly migmatized. The original rock belongs to flysch sequence with thickness of 1460 m. The folds are tightly closed, the axial plane is distorted, horizontal, and overturned, which suggests a metamorphic feature of geosynclinal origin. But in the west, it consists mainly of the upper Paleozoic clastic rocks and carbonate formation of coastal-shallow sea facies, and coal bearing
clastic rocks of sea-continental alternating facies. The total thickness amounts to 2800 m. It pertains to Indosinian Fault-Fold Belt. In the range of 25 km, there are thirteen secondary anticlines and synclines with axes striking N20°-30°E. These folds are symmetrical or asymmetrical box-like or comb-like in shape, or domal brachy anticlines, which are characteristic of the folds in para-platform.

There are some unconformities between upper and lower Paleozoic strata along some part of Guang-Cong Fault Belt. For example, in Yuanxiatian, west of Mt. Wuleiling (1500 m east of the Belt), where the lower Carboniferous Meng-Gongao Formation consisting of medium to coarse grained quartzo-felsparthic sandstone is unconformably underlain by the lower Paleozoic biotite feldspar schist (Fig. 3). In Longbei Reservoir, southeast of Taihe, Meng-Gongao Formation unconformably covers
Fig. 3 The structural section of Yuanxiatian in north suburb of Guangzhou showing the contact relationship between Lower Paleozoic and Carboniferous which reflected the influence of Caledonian movement. The Guangzhou-Conghua Fracture is mainly developed within the Lower Carboniferous series.

1: Regolith of Quaternary Period. 2: Crushed and Petrified quartz-sandstone in Zimen-giao Formation of Lower Carboniferous series. 3: Andalusite slate of Lower Carboniferous Series. 4: Quartz-sandstone containing feldspar and silty mudstone intercalated with thin beded Carbonaceous mudstone of Meng-Congao Formation of Lower Carboniferous Series. 5: Lower Palaeozoic black mica plagioclase-gneiss and gneiss-quartzite. 6: Silicified belt. 7: fault plane. 8: unconformity plane.

Fig. 4 Geological cross section of Longbei, Taihe, showing contact relationship of unconformity between Lower Palaeozoic Errathem and Lower Carboniferous Series.

1: dark gray carbonaceous shale and siltstone. 2: ferritization sandstone with gravel. 3: Pay gravel sandstone with gravel. 4: thin beded brown iron ore. 5: striped migmatite.

the old weathered surface of the lower Paleozoic banded migmatite (Fig. 4). The sediments of both sides are offset by fault.

2. Offset of E-W trending Early Structure by the Fault Belt

Guangzhou-Zengcheng Uplift Belt and Yunfu-Yaogu Uplift Belt are about E-W distribution, which are mainly made up of the Caledonian metamorphic rocks and migmatite. Before Indosinian movement, it was generally situated at the same latitude. Since Indosinian movement, it had been cut by Guang-Cong Fault Belt and separated apart by Shanshui Basin.

Besides, Guang-Cong Fault Belt cut across
Guangzhou-Luofushan Fracturel Belt and displaced it in dextral sense and even caused the Nangang-Shahe direction to vary from N80°-85°E to N10°-15°E.

Gang-Cong Fault Belt also cut across E-W trending Fogang-Fengliang Structural Belt and Lianjiang-Yangjiang Structural Belt in the southwest extension (Fig. 2).

3. **Control of the Meso-Cenozoic Sedimentary Basins by the Fault Belt**

Upper Triassic and middle-upper Jurassic deposits are distributed along the eastern side of Guang-Cong Fault Belt. They mostly appear in fault contact with lower Paleozoic strata and they are about 1500 m thick.

Cretaceous and Tertiary sediments are distributed along the Fault Belt. In the west of the fault, the sedimentary basin appears as semi-graben, such as Longgui Basin (Fig. 5), Taiping Depression (Fig. 6) and so on. Longgui Basin consists of lower Tertiary. The basin is cut by fault in the east and onlapped in the west, the basement is uplifted in the north and depressed in the south. The general distribution is coincident with Guang-Cong Fault Belt.

Based on geophysical and drilling data, to the southern extension of Guang-Cong Fault Belt in Sanshui Basin, 1000-2000 m of the the Cretaceous-Tertiary deposits is estimated in the Shiwan Depression, whereas in the east of the Fault Belt, the basement is shallow, and the Cretaceous-Tertiary deposits in Pingzhou Uplift is only about 300-500 m thick. The southeast of Sanshui Basin is restricted by the E-W extending tectonic line, and Guangzhou Depression and Pingzhou Uplift is generally E-W extension, whereas in the western margin, the direction of the structural line is NE, and Shiwan Depression and Guanshan Uplift also extend in NE direction (Fig. 7).

4. **Control of Magnetic Activities by the Fault Belt**

Some Yanshan magma intruded along Guang-
Cong Fault Belt, such as Longgang rock body (130–145 Ma.), Lapu rock body (141 Ma.). Some of the intrusions are offset again by the fault to form dynamic metamorphosed belt, such as Diaoli rock body, Qifu rock body and Hong-pingshan rock body, etc.

Late Jurassic Yintai volcanic rocks developed along the Fault Belt from Conghua to Men-guan hot spring are offset by later movement of the fault. There are two Cretaceous eruptions in the Shanshui Basin along Guang-Cong Fault Belt; one is rhyolite, dacite and pyroclastics which are mainly distributed in Sou-zhugang and Shixi with 100 m thick. Other is andsite-basalt, which are seen in Weitang and Tancun with 55 m thick.

In addition, there are many eruptions. In Xiqiaoshan of Nanhai County, they consist of trachyte and volcanic breccia, tuff and so on.

5. Characteristic Feature of Tectonite along the Fault Belt

Since Mesozoic, the Fault Belt has undergone polyphase tectonic movements with different dynamic features to form a wide dynamic metamorphic belt.

Where the fault cut across the granite and sandstone, usually breccia cataclasite and mylonite are developed, and oftenly silification are seen. The shear belt is about several tens of meters wide. In 6 km east of Zhongluotan, there form 50 m wide silification breccia belt (Fig. 8). Under microscope, it is observed that the crystal plane, cleavage plane, and mica are distorted, and quartz is flattened. There are some fine-grained clastic rocks surrounded the particles. These superposed fea-
Guangzhou-Conghua Fault Belt, Its Formation and Evolution

Table 1 The formation and evolution of Guang-Cong Fault Belt.

<table>
<thead>
<tr>
<th>Tectonic Stage</th>
<th>Age</th>
<th>Dynamic feature</th>
<th>Activity strength</th>
<th>Major characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Himalayan Tectonic</td>
<td>Late</td>
<td>Quaternary to Late Tertiary</td>
<td>Compressoshear</td>
<td>Tertiary as gently folded, hanging wall of the fault was uplifted from deeper part.</td>
</tr>
<tr>
<td>stage</td>
<td></td>
<td></td>
<td>weak</td>
<td>The terrace along right bank of Liu-xihe River becomes narrower, the second terrace was eroded.</td>
</tr>
<tr>
<td></td>
<td>early</td>
<td>Early Tertiary Period</td>
<td>Extentional shear</td>
<td>Formation of Longgui Basin and the development of syndepositional faults.</td>
</tr>
<tr>
<td></td>
<td>Late</td>
<td>Cretaceous</td>
<td>Extentional shear</td>
<td>Small intrusions and volcanic eruptions of Shuzhugang and Shiweitang.</td>
</tr>
<tr>
<td></td>
<td>Early</td>
<td>Jurassic to Late Triassic</td>
<td>Extentional shear</td>
<td>Formation of breccia belt, mylonite and schist in early stage granite of Yanshanian and in late Paleozoic strata.</td>
</tr>
<tr>
<td></td>
<td>Middle Triassic to Devonian</td>
<td>Compressoshear</td>
<td>intense</td>
<td>The second and the third stage's granite and Jurassic volcanic rocks intruded and erupted along the Fault Belt.</td>
</tr>
<tr>
<td>Indosinion Tectonic</td>
<td>Middle Triassic to Devonian</td>
<td>Compressoshear</td>
<td>intense</td>
<td>Offset Yunfu-Yaogy-Zengcheng Uplift Belt and Guangzhou-luofu Shan Fault Belt.</td>
</tr>
</tbody>
</table>

Fig. 8 Geological cross section of Gaoping, Zhong-Luotan.

1: slope wash alluvial regolith of Quaternary Period. 2: red sand-conglomerate rock of Paleogene Period. 3: cataclastic mylonitization silification belt. 4: medium grained porphyritic biotite granite in the third period of Yanshanian stage.
tures indicate the polystage faultings.
In the west of Baiyun Mts., there is a Carboniferous schist belt of 40 m wide, which dips to N70°W at 52°. In Yuanxiatian, the fault cuts through lower Carboniferous and forms a 50 m wide silicification belt.
There is a banded andalusite slate belt along Guang-Cong Fault Belt. It extends from Longbeikou of eastern Taihe via Baizugiao, Baiyunshan, Yuanxitian to Guangzhou Institute with 13 km long and 50-160 m thick. Particularly, the andalusite belt in Yuanxiation developed in lower Carboniferous might be the result of thermal metamorphism. Thus, it is thought

Fig. 9 Distribution map of magnetic anomaly Guang-Cong Fracture (after Yang Minggin, 1985, modified).
1: Guang-Cong Fracture. 2: depression region. 3: uplift region. 4: isopleth of magnetic anomaly.

(44)
that in addition to dynamic metamorphism, there was a thermal metamorphism superimposed it.

III. Formation and Development of the Fault Belt

The formation, evolution and transformation of dynamic characteristics of the belt may be divided into three stages as follows (Table 1):

1. Indosinian Tectonic Stage

As mentioned above, Guang-Cong Fault Belt offset Yaogu-Zengcheng Caledonian Uplift and Guangzhou-Luofushan Fault Belts, which indicate that it is a product of post Caledonian movement. In consideration of the conformable and disconformable contact in the strata from Devonian to mid-Triassic in Guangzhou and in China, the Fault Belt might not be formed before mid-Triassic. Although Yanshan movement formed a series of NE and NNE structural belt, they appear mostly as rising and falling of fault block, whereas Guang-Cong Fault Belt is coincident with Guanghua Indosinian Fault-Fold Belt, which shows a large scale dextral movement. Thus, the Fault Belt began to form in the end of mid-Triassic, which is concordance with formation of Guanghua Fault-Fold Belt. The fault is of compresso-shear characteristics.

Guang-Cong Fault Belt was formed in Indosinian movement and cut through many large scale E-W trend Caledonian structural belt, which illustrates that E-W trend tectonic framework was predominant in southeast China before Mesozoic. After Indosinian movement, E-W trend tectonic framework was replaced by NE trend framework. This may be explained by that the Asian continent moved to the south and the Pacific ocean floor moved to the north.

2. Yanshanian Tectonic Stage

Guang-Cong Fault Belt in Yanshanian stage may be divided into early and late stages.

(a). Early stage: There are No. 2 and No. 3 stages of granite intrusions and late Jurassic volcanic rock eruption. The andalusite slate belt as described above is possibly related to the fracturing. In this time, it appeared as tensional feature and magma was allowed to intrude so as to form andalusite slate belt.

(b). Late stage: There are cataclastic rock, mylonite, molasse along the fault belt, which show the faulting of compresso-shear characteristic at this stage.

According to magnetic data, the contour lines of magnetic anomaly isopach is in concordance with the strike of fault (Fig. 9) which also suggests that Guang-Cong Fault Belt is a large fracture belt.

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Fig. 10 The geological cross section near Shen-Sang.

1: Quaternary System. 2: Xibu Formation of Eocene Series. 3: Maozifeng Formation of Upper Devonian Series. 4: regolith. 5: red conglomerate. 6: red pay gravel sandstone. 7: red sandstone bearing gravel. 8: gray-white siltstone. 9: gray-white Quartz-sandstone. 10: plane of unconformity. 11: fault and moving direction.
Fig. 11 Isopach map of Quaternary System near Guang-Cong Fracture. (after Yang Mingglin, 1985, modified).
1: fault. 2: inferred fault. 3: erosion area. 4: accumulation area. 5: thickness of Quaternary system and drill hole position. 6: isopach of Quaternary system(M).

(46)
Since mylonite along the Fault Belt is silicified and the Cretaceous volcanic eruptions are known in Souzhuang, Guangzhou, Shixi, Shiweitang and so on, there might be a tensional shear phase after late Yanshanian stage.

3. Himalayan Tectonic Stage

Since early Tertiary, the stress state of the Guang-Cong Fault Belt changed from tensional shear to compresso-shear stages. In early stage, it succeeded to the late Cretaceous activity and formed a series of Cretaceous to Tertiary sedimentary basin migrated with time to the Fault Belt (Fig. 10). In later stages, it was in compresso-shear status and produced gentle fold in the early Tertiary sand-conglomerate beds. Moreover, on the right bank of the Linxihe river the second terrace was narrowly eroded, these also indicate that it was compresso-shear status since Quaternary.

IV. Fault Activity of Neotectonic Stage

1. Feature of Tectonic Topography

In landsat image and air photographs, Guang-Cong Fault Belt shows clear trace. There are fault ridges, fault scarps, fault triangle surfaces, waterfall and a series of small faults parallel to major fault. Along a NW trending western major fault, the well known hot spring waterfalls are developed within 1 km. There are Xiangfen waterfall (6 m high), Feihong waterfall (20 m high) and Baizhangfeitaotao waterfall (40 m high).

2. The Topographic Reflection and Quaternary Sediments

In the east of it, there are Baiyunshan, Maofenshan, Guanyinshan Mts. of 100-200 m above sea level, whereas in the west, the Guanghua Plain is mainly composed of Quaternary accumulation and is less than 50 m above sea level.

Quaternary accumulation is obviously controlled by Guang-Cong Fault Belt. The isopach contours extending in NE direction shows that the sedimentary center is situated along the Fault Belt (Fig. 11). The thickness is 10-20 m, some times over 30 m. The lithology becomes coarser from north to south.

![Distribution of hot water in north of Guang-Cong Fracture](image1)

![Isopach map of 200 m and 300 m depth in geothermal region of Longgui](image2)
3. Distribution of Hot Springs
Guang-Cong Fault Belt also controls the distribution of hot water. Some hot springs emerge along fault belt (Fig. 12).
Long-Gui geothermal isopleth of 200 m to 300 m depth in Fig. 13 coincides with the trend of major fault.
Based on drillings and hot spring data, the water temperature is increasing from south to north, i.e. 24°C at Shiweitang, 32°C at Shanzhiyu an, 38°-39°C at Longgui, 71°C at Conghua Hot Spring, 32°C-55°C at Liangkou-Tangliao of Conghua (Table 2). These facts, in some extent reflect that the north is more active than south. In fact, the granite in the north is exposed so as to let hot water to upwell along fissures, whereas, granite in the south is covered by fluvial layers, which reduce the temperature of hot water while it is passing through the Quaternary loose sediments.

Table 2 General characteristics of the underground hot water spots of Guang-Cong Fault Belt (number from north to south).

<table>
<thead>
<tr>
<th>No.</th>
<th>Position</th>
<th>Spring or drilling</th>
<th>T (°C)</th>
<th>Discharge rate /second</th>
<th>Lithology</th>
<th>Feature of hot water occurrence</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Langkou</td>
<td>Spring and drilling</td>
<td>32</td>
<td>0.30</td>
<td>Granite</td>
<td>Small spring</td>
<td>250M depth in drill</td>
</tr>
<tr>
<td>2</td>
<td>Tangliao Hot Spring village</td>
<td>Spring and drilling</td>
<td>55</td>
<td>6.36</td>
<td>Granite</td>
<td>drowned by river</td>
<td>57°C by Guanzhou seismology team</td>
</tr>
<tr>
<td>3</td>
<td>Chonghua Hot Spring</td>
<td>Drilling and Spring</td>
<td>71</td>
<td>16.7</td>
<td>Granite</td>
<td>many hot water drill are exploited</td>
<td>61.6°C by Chonghua survey data</td>
</tr>
<tr>
<td>4</td>
<td>Jilonggang, Chonghua</td>
<td>Drilling and Spring</td>
<td>36.8</td>
<td>7.5</td>
<td>Limestone in Quaternary</td>
<td>Small spring</td>
<td>Highest Temperature 39.5°C, 40-25M depth in drill</td>
</tr>
<tr>
<td>5</td>
<td>Gaobu, Chonghua</td>
<td>Spring</td>
<td>25</td>
<td>8.7</td>
<td>Granite &amp; fluvial deposits in Quaternary</td>
<td>Mouth of spring 3×3M</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Xiangyang, Chonghua</td>
<td>Drilling</td>
<td>32</td>
<td>0.06</td>
<td>Granite</td>
<td>No occurrence</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Daao, Chonghua</td>
<td>Drilling</td>
<td>26</td>
<td>0.34</td>
<td>Siltstone</td>
<td>Few occurrence</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Qiuzhuang, Taipingchang</td>
<td>Drilling</td>
<td>27.5</td>
<td>0.26</td>
<td>Conglomerate</td>
<td>No occurrence</td>
<td>Drill depth 400M</td>
</tr>
<tr>
<td>9</td>
<td>Zhuzhiyuan, Longgui</td>
<td>Drilling</td>
<td>36-39</td>
<td>14.4</td>
<td>Conglomerate siltstone</td>
<td>No occurrence</td>
<td>Drill depth 250-300M</td>
</tr>
<tr>
<td>10</td>
<td>Kejiashu</td>
<td>Drilling</td>
<td>27</td>
<td>4.7</td>
<td>Limestone</td>
<td>No occurrence</td>
<td>Drill depth 101M</td>
</tr>
<tr>
<td>11</td>
<td>Tongquarry, Guangzhou</td>
<td>Drilling</td>
<td>32</td>
<td>0.14</td>
<td>Granite</td>
<td>No occurrence</td>
<td>Drill depth 86M</td>
</tr>
<tr>
<td>12</td>
<td>Sanyuanli, Guangzhou</td>
<td>Drilling</td>
<td>32</td>
<td>39.4</td>
<td>Limestone, dolomite</td>
<td>Hot water swimming pool.</td>
<td>Drill depth 80M</td>
</tr>
<tr>
<td>13</td>
<td>Shiweitang, Guangzhou</td>
<td>Drilling</td>
<td>24</td>
<td></td>
<td></td>
<td></td>
<td>Data from Guangzhou seismology team</td>
</tr>
</tbody>
</table>

(48)
Thus, the water temperature does not actually reflect the fault activity.

4. Seismicity

There are three earthquakes (magnitude ≥ 4) along the fault belt (Fig. 14). The 1656 earthquake occurred in Heshan and 1969 earthquake occurred in Yangjiang were all located along the southern extension of the Fault Belt (Table 3). The earthquakes (about magnitude 1) frequently take place in the fault belt which illustrate that the fault belt is an important earthquake activity belt.

5. Uplifting and Subsiding Velocity of the Crust

Based on 1956, 1966 geodetic surveying, the crustal movement of the northern area is more active than that of the southern one. Gaoping is uplifting, whereas south of Yanbu is sub-
siding, the zero value is nearby Guangzhou. Since 1954, the crust in the east of Guang-
Cong, Shahe-Shougouling is uplifting $+2 \sim +4$
mm/y, whereas the crust in the west is des-
centing $-1 \sim -2$ mm/y.

V. Conclusion

1. The Fault Belt was formed by Indosinian
tectonic movement, and has been still active
at Yanshanian and at Himalayan movements. It
shows poly-staged, and poly-phased character-
istics, which is concordant with tectonic move-
ment of southeast China since Meso-Cenozoic
time.

2. The faulting took place at the alterna-
tion of compressoshear and tensional shear.
The activity has decreased with time, which
is also coincident with crustal development of
southeast China.

3. Accompanying with the poly-phased fault-
ing, there has been occurred magma intrusions
and eruptions which controlled or partly con-
trolled the Luogang, Lapu, Hongpingshan rock
bodies of Yanshanian stages and Yuntaishan,
Shouzhugang, Shiweitang volcanic rocks of
Jurasso-Cretaceous.

4. The repeated activities of the Fault Belt
controlled the formation of the Caledonian
metamorphic rocks and early Paleozoic migmat-
tite in Guangzhou-Zengcheng Uplift, and the
distribution of Guangzhou-Huaxian late Pale-
ozoic strata. It also controls the forma-tion of
Taiping, Longgui, Sanshui Meso-Cenozoic red
basins and of the Quaternary sediments and
the distribution of the hot spring and earth-
quakes as well as topography.

Table 3 Earthquakes related to (M$\geq$4.8) Guang-Cong Fault Belt.

<table>
<thead>
<tr>
<th>No.</th>
<th>date of quake</th>
<th>epicenter position</th>
<th>N. latitude</th>
<th>E. longitude</th>
<th>seismicity</th>
<th>intensity</th>
<th>depth of focus (km)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Sep. 17, 1372</td>
<td>Guangzhou</td>
<td>23.1</td>
<td>113.2</td>
<td>4.8</td>
<td>VI</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Mar. 3, 1656</td>
<td>Heshan</td>
<td>22.6</td>
<td>112.8</td>
<td>4.8</td>
<td>VI</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Oct. 10, 1683</td>
<td>Nanhai</td>
<td>23.1</td>
<td>113.2</td>
<td>5</td>
<td>VI</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>July 26, 1969</td>
<td>Yangjiang</td>
<td>21°45'</td>
<td>111°45'</td>
<td>6.4</td>
<td>VII</td>
<td>5</td>
</tr>
</tbody>
</table>

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1, 63-72.
广州-从化断層・構造帯，その形成と発展
厳 国 柱
要 目
この断層・構造帯は古くインドシナ変動によって形成されたものであるが，燕山・ヒマラヤ変動においてもなお活動的で，中生代〜新生代における中国東南部の変動に対応していくつかの時期や活動期を区分することができる。断層運動の特徴は，圧縮性の切断と引張り性の切断が交互している点である。また断層運動は，中国東南部の隆起の進展に伴って弱くなっていた。

燕山変動やジュラ紀〜白亜紀の貫入岩・噴出岩は，この断層運動に規制されて，いくつかの時期に生成されたものである。またこのような断層運動の繰り返しによって，カレドニア変動時代の変成岩や前期古生代のミグマイトの形成，および後期古生代の堆積岩類の分布などの規制を受けているばかりか，さらに中生代〜新生代における赤色岩や第四系の堆積盆地，温泉・地熱・地形などのすべてが規制されている。

Main place names and their Chinese expressions

A
Anyuan, 安远

B
Baini, 白昵
Baizhangfeilao, 百丈飛濤
Baizuqiao, 百足橋
Banghu, 蚌湖
Beicun, 北村
Beijing, 北京

C
Cangcheng, 仓城
Changgang, 长岗
Chini, 赤泥
Conghua, 从化

D
Daao, 大凹
Dali, 大利
Daliang, 大良
Dash, 大石
Diaoli, 吊里
Dingnan, 定南
Duimianling, 对面岭

E
Enping, 恩平

F
Feihongpu, 飞虹瀑
Fengliang, 丰良
Fogang, 佛岗
Fushan, 佛山

G
Gangbei, 岗背
Gaobu, 高步
Gaoho, 高鹤
Gaoming, 高明
Gaoping, 高坪
Gaushan, 官山
Guanyinshan, 观音山
Guangdong, 广东
Guangzhou, 广州

H
Haerhin, 哈尔滨
Hailingdao, 海陵岛
Hecheng, 海城

(51)
<table>
<thead>
<tr>
<th>Page</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>312</td>
<td>Y. Guozhu</td>
</tr>
</tbody>
</table>

| S   | Sanshui, 三水  |
| Sanyuanli, 三元里 |
| Sanzhou, 三洲 |
| Shahe, 沙河 |
| Shajiao, 沙膏 |
| Shanghai, 上海 |
| Shawan, 沙湾 |
| Shengang, 神岗 |
| Shenyang, 沈阳 |
| Shilong, 石龙 |
| Shiwan, 石湾 |
| Shiweitang, 石围塘 |
| Shixi, 石溪 |
| Shouguoling, 瘋狗岭 |
| Shuikou, 水口 |
| Shunde, 顺德 |
| Souzhugang, 城珠岗 |

| T   | Talimu, 塔里木 |
| Taihe, 太和 |
| Taipingchang, 太平场 |
| Taishan, 台山 |
| Tancun, 潭村 |
| Tangliao, 塘料 |
| Tianshan-xingmeng, 天山一兴蒙 |
| Tonghe, 通和 |

| W   | Wagang, 瓦岗 |
| Wonquan, 温泉 |
| Wuhan, 武汉 |
| Wuleiling, 五雷岭 |
| Wulumuqi, 乌鲁木齐 |

| X   | Xiangyrng, 向阳 |
| Xiangfenpu, 香粉浦 |
| Xinfeng, 新丰 |
| Xinhu, 新华 |
| Xinxing, 新兴 |
| Xiqiaoshan, 西樵山 |

| Y   | Yanbu, 盐步 |
| Yangchun, 阳春 |
| Yangjiang, 阳江 |
| Yangjicun, 杨箕村 |
| Yangzi, 杨子 |
| Yaogu, 腰古 |
| Yaoji, 亚婆吉 |
| Yongtaizhuang, 永泰庄 |
| Yuanxiatian, 元下田 |

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<table>
<thead>
<tr>
<th>Guangzhou-Conghua Fault Belt, Its Formation and Evolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yunfu, 云浮</td>
</tr>
<tr>
<td>Yuntaishan, 云台山</td>
</tr>
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<td>Zhuliao, 竹料</td>
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<td>Zhulouwo, 竹头窝</td>
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<td>Zhuziyuan, 竹子园</td>
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