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"Contemporary Chinese Geoscientists" by George Tsang

This issue we continue the interviews for the respective academicians, the articles are arranged in the alphabetical order of their family names.

We have Professors WANG, De-zi and Professor XUE, Yu-qun from Nanjing University and Professor YIN, Hong-fu from China University of Geosciences (Wuhan).

We thank the kind acceptance of the interviews and the review of the academicians for their articles.

當代中國
地質學家風采

Contemporary Geoscientists of China
- WANG, De-zi (花崗岩專家王德滋院士)

Professor Wang is a petrologist in the field of granite and volcanic rocks. He was the first in China to raise the concept of "subvolcanic granitoids" which concerns the intrusion of subvolcanic granitoids into complex rock considering from time, space and source of materials; He found the first S type volcanic rock in China and classified it into water rich, water deficient and fluorine rich associations, which provide new concept for the formation of these kind of rocks; He used plate tectonics to study the formation of "Large igneous province" and its relationship with metallogeny in eastern China in Mesozoic era.

Professor Wang was born in 1927 in a teacher's family in Tai Xing County (泰興縣), Jiang Su province. His father was a teacher. His mother passed away when he was 7 and his father followed when he was 9, he was brought up by his two sisters, the parents were survived by five children, Professor Wang is the fourth.

Interview at his residence

Professor Wang completed his lower high school course under a very arduous condition during Japanese invasion period after he graduated from primary school in 1938, the school was moved to a temple which was 10 km from his county. The living in this period was memorized deeply in his mind. He entered another upper high school in 1941 where the excellent students among the top three of the class were exempted from paying tuition, Professor Wang was one of the three in the whole upper high school.

Professor Wang enrolled in the geology department of National Central University after the school returned from Chongqing to Nanjing in 1946 just one year after the surrender of Japanese in 1945.

Affection for geology

The enthusiasm for geology of Professor Wang was brewed in his youth being fascinated by two renowned persons, Mr. DING, Wen-jiang (丁文江), the pioneer geologist of China who studied geology and biology in Japan and Britian during the end of Qing dynasty, Ding was from his county.

At Mr. Ding, Wen-jiang's hometown, Ding is the idol of Professor Wang

Another geologist, Mr. XIE, Jia-rong (謝家榮) who was the author of a book- "Geology", the young Wang was fascinated by the beautiful geological pictures which confirmed his decision to devote his life into geology. We believe the success of the master is probably derived from his youth.

Love forever

Professor Wang and his wife, HONG, Feng-qing (洪奉青) married in 1953. They have two daughters. The elder daughter is assistant provost in an American university who holds a Ph.D in legal studies. She has one child. The younger daughter is a medical doctor working in Nanjing with one child too. Unfortunately, Professor's wife has been sick since 2005, he is taking care of her himself which shows the genuine love of 60 years.

His family

With his dearest in "Twelve apostles"

Political activities

Professor Wang was an active student in the progressive political activities, such as the "May 20 patriotic student movement" in 1947 which was an anti-Jiang movement appreciated by Mao Ze-dong as the "second war line" against Jiang government. Professor Wang was admitted as an

underground member of communist party in January, 1949. He joined another patriotic movement to block the transfer of Central University to Taiwan on the eve of revolution.

Academic appointments

Professor Wang has been teaching in Nanjing University for more than sixty years. He was a lecturer in 1955, a professor in 1978 and later as PhD programme supervisor in 1984, he was elected as academician of Chinese Academy of Sciences in 1997. He was vice provost from 1978~1984, vice president from 1984~1988, dean of the School of Geosciences from 1991~1993.

Other appointments include

Vice President of Geological Society of China; Director of Igneous professional committee of Chinese Society of Mineralogy, Petrology and Geochemistry; Member of discipline assessment group of Academic Degree Commission of the State Council; Vice chief editor of Acta Petrologica Sinica; Chief editor of Journal of Nanjing University (Natural Sciences); Chief editor of Geological Journal of China Universities.

Teachers of Nanjing University visit Johns Hopkins University in 1982

Academic exchanges

As a group member of Nanjing University delegate who visited Johns Hopkins University and other 13 Institutes in USA in 1982; As a visiting professor to Nagoya University in 1986; On behalf of the Ministry of Education to lead a delegate of university presidents to sign joint programme of Sino-Australia for PhD students with the University of Melbourne and other universities in 1987.

The Presidents of Chinese Universities visit Australia in 1987

Meeting with President Bush

Academic achievements

Nanjing University is the hub of granite study, especially the study of granite in southern China. Nanjing University had five scientific research achievements in the sixties of last century which were called as the "Five Golden Flowers" of the school that were appreciated by the Central government leaders, such as DENG, Xiao-ping (鄧小平)

and Zhu, De (朱德), one of them was “the study of granite in southern China”.

An international symposium in “The relationship between geology and metallogeny of granites” was called by Nanjing University in 1982 which was the first international symposium organized by a tertiary institute in China which signified the research of Nanjing University in this field had achieved international recognition. Professor Wang was the secretary of the organizing committee.

Site visit to Huangshan with delegates of international symposium in 1982

Academician XU, Ke-qin (徐克勤), department head and teacher of Wang

Subvolcanic granitoids

Professor Wang was the student of academician XU, Ke-qin (徐克勤) who was the founder of granite study in southern China. Professor Xu graduated from University of Minnesota holding a PhD degree. The study of Professor Wang on “subvolcanic granitoids” or “granitic volcanic-intrusive complexes” was regarded as the breakthrough on the study of granites，since the previous scholars usually neglected the relationship between granite and its associated volcanic rock. The granite is the “root” of the central volcanic massif formed by rhyolite and dacite. A similar discovery was found by an American petrologist, Mr. R.L.Smith in west side of U.S.A. The study of Wang and Smith in this field was almost simultaneous.

S type volcanic rock

The Australian petrologists, B. Chappell and A.H.R.White classified granites into two types, “I and S” where “I” refers to granites associated with volcanic rocks from same source while “S” without. Professor Wang and his group found the first S type volcanic rock in China in 1988, he classified the S type volcanic rocks into water rich, fluorine rich and water deficient. Professor Wang further classified the “granitic volcanic-intrusive complexes” into two types, one is “simultaneous melting” which is equivalent to “I” type, another is “crust re-melting” type which is equivalent to “S” type.

The S type volcanic rock in China

He found a subvolcanic cordierite granite porphyry in Guangxi which is an indicator of "S" type volcanic rock with no mineral bearing.

His study is applied in mine exploration which was summarized in the book- "The Mesozoic Volcanic-intrusive complexes and their metallogenic relations in east China", Science Press, 1996.

Large igneous province

It refers to the continuous, big scale volcanic eruption and magma intrusion in a comparative short period which causes a large area distribution of igneous rocks in an area of at least 100,000 km^2. Professor Wang proposed a new model to identify the potassium rich "shoshonite province" in a project concerning "The study of gold deposit in eastern China" which was considered to be at "Advance international level".

Teaching latitude

Professor Wang responded for the teaching of two courses- "Optical Mineralogy" and "Fundamental Petrology"**,** he also involved in the administration and party jobs. He concerned the ideological education and beyond class life of students, so he received a good feedback from his students.

"I was looking for Ta/Nb deposit in the boundary of Su-Lu provinces in 1960, I was living in a farmer's home, no vehicles were available at that time; Professor Wang walked several tens of kms to meet me, he listened to my report and gave me instructions under the small oil lamp, he always take care of the field work of students nevertheless he prefers to let them independent", said by LIU, De-liang (劉德良), a student of Professor Wang who was his dissertation supervisor in 1961. The student would never forget his teacher in his life, he has kept the corresponding letters of his teacher up to this moment.

In Professor Wang's view, talent training should base on fundamental education, he has been teaching basic courses for junior students for many years. He authored two textbooks, "Optical Mineralogy" and "Crystal Optics", the former has been used for more than 30 years so he revised the book in 2006 at the age of 80 with the help of his student, XIE, Lei (謝磊)，associate professor. Besides, Professor Wang co-authored another reference book, "Volcanic rock petrology" with Professor ZHOU, Xin-min (周新民).

Professor Wang has supervised 10 PhD students in his teaching life in Nanjing University, he said he has too many administration jobs to do and he could not guarantee the standard if with too many students.

His PhD students

Scholarship pursuance

Professor Wang concluded his scholarship road in four characters, "Perseverance, Persistence, Sincerity, Simple" (堅毅誠樸) . Perseverance- steadfastness in doing something despite difficulty; Persistence- persist in target; Sincerity- proceed with genuine feelings; Simple- without much decoration.

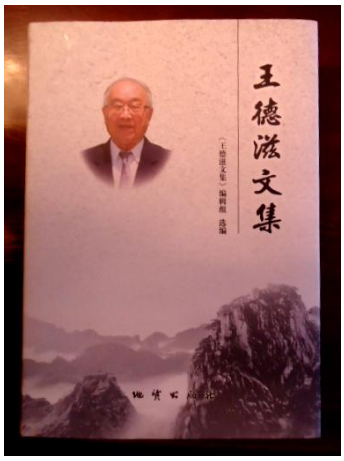
"**Life is too short, seize every minute;**

Forget your age, forget you are old；Strive unceasingly! (人生苦短，只爭朝夕，忘齡忘老，自強不息)", Professor Wang says.

At 30th International geological conference

Awards and Prizes

Professor Wang was awarded "Excellent graduate supervisor" (優秀研究生導師) by Jiangsu Education department in 1991, "Excellent communist party member"(優秀共產黨員標兵) by Jiangsu Education Committee of Chinese Communist party.



Collection of articles

Some of the Publications:

Professor Wang has published 14 books of special issues, textbooks and translation and, more than 200 articles in domestic or overseas journals, such as,

The study of lamprophyre of Gao Zi- Xia Shu, Jiangsu, Nanjing University Journal, 1957〈江蘇高資下蜀煌斑岩的研究〉; An autoclastic volcanic-intrusive rock and its metallogenetic relations, Earth Science, Advance in sciences of China, John Wiley & Sons, New York, 1986; Characteristics and genesis of Cenozoic peraluminous granitoids of the Okinoshima Island, SW Japan, 1990〈日本西南沖島新生代過鋁質花崗岩類的特徵和成因〉; The Mesozoic Potash-rich volcanism in the Tancheng- Lujiang fault zone and its vicinity, Annual report of the Laboratory of Lithosphere Tectonic Evolution, Science Press, 1994; Look back and look forward to granite research in China, Acta Petrologica Sinica, 1999〈我國花崗岩研究的回顧與展望〉;Characteristics and petrogenesis of late Mesozoic granitic volcanic-intrusive complexes in South-eastern China, Geological Journal of China Universities, 2002〈中國東南部晚中生代花崗岩質火山－侵入雜岩與成因〉;Mesozoic magmatism and granitic dome in the Wugongshan Massif, Jiangxi Province and their genetic relationship to the tectonic events in Southeastern China, Tectonophysics, 2001; The spatial and temporal distribution of Mesozoic Volcanic rocks in East China, The XII General Assembly of IUGU, Birminghem, UK, 1999; The Mesozoic Volcanic-intrusive complexes and their metallogenic relations in East China, Science Press, 1996; Late Mesozoic basin and range tectonics and related igneous rock assemblages in southeast China, Geoscience Frontiers, 2012.

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2. Wang Dezi, Fragments of memoirs (往事雜憶), Nanjing University Press, 2012

3. Wang Dezi, Collection of articles（王德滋文集），Geological Publishing House，2012

Contemporary Geoscientists of China
- XUE, Yu-qun（水文專家薛禹群院士）

Interview at office

Professor Xue was born in Wuxi, Jiansu (江蘇無錫) province in 1931. He graduated from Tangshan Engineering College (唐山工學院) in1952，he completed his graduate studies in Changchun College of Geology in 1957 under the supervisor of Professor Klimentov from Moscow.

With Professor Klimentov, his teacher of graduate study in1956

He did simulation of numerical research of groundwater in department of hydrogeology and water resource in University of Arizona, U.S.A. during 1982~1984. He was elected as academician of Chinese Academy of Sciences in 1999. He has been professor in Nanjing University for more than 30 years. He has produced almost 100 professors and senior professor level engineers among his students.

"Precise, simple and honest" this is the request of the Professor to his students. He said the young people nowadays are not willing to work hard, no short cut for scientific research, one must brave to question the job of others.

Political background of family

The father of Professor Xue has 3 brothers, a younger brother joined Communist Youth League (共青團) in 1923, then became a communist in 1925, he was the first party secretary of Wuxi Communist party in 1925. An elder brother of his father was an officer of Chinese Nationalist party, a rival party of Chinese Communist party. The father of Professor Xue was political neutral. Her mother insisted her son should be in academy.

Family

Professor Xue is the elder son of the family, he has four brothers and a younger sister. An elder sister passed away in early age. His father worked in a chemical plant. His mother dealt in silkworm chrysalis business and as a consultant, but the facilities and houses were destroyed by Japanese in the war. His uncle told him a man should love his country, but his mother felt it was dangerous to involve in politics, hence he randomly chose geology.

Professor Xue has a son and a daughter. The son is teaching chemistry in America who has two children, a son and a daughter, both speak good Chinese. The daughter of Professor Xue was in Australia and America

as now in China who has two sons, the elder son graduated from a Chinese senior high school and is now studying in an American university, the younger son is studying in junior high school, the family is now in China. The wife of Professor Xue was a structural geologist before she retired 20 years ago.

Family picture in 1980

Demand of the country

China was liberated at the time of Professor Xue's graduation from a senior high school. Nanjing University was assigned to recruit 200 students for the field of hydrogeology and engineering geology when China started her first five year plan, however, there were only about 25 faculty members in the whole department of geology of Nanjing University in 1952, a similar order was made next year. Professor Xue started his work in the same year in Nanjing University. He felt very sad in one of his trips to Huai river（淮河）region having flooding in Luohe (漯河) when he saw the sufferings of the people. He made up his mind to bite the bullet, he should do something for the people! It was the necessity of the people! North-East China has no water, Yellow river is always flooding, these became the responsibilities of the young professor.

"The Three Gorges (the biggest dam of the world) is not possible to be destroyed by the bombardment of enemies", Professor Xue said, as some rumours saying it would be a weak point for the country's security. The Professor is so confident for the safety of the construction. He also neglects the affection of earthquakes caused by the dam.

Looking for atomic bomb site in Xinjiang in 1982

"China is insufficient of water, water consumption per capita is less than 1/3 of world standard. We can learn from Israel, they have successful experience, we can save water from agriculture and industry by appropriate utilization. Water reserve in China is number 6 in the world list. We can assign government officers to take care of one river each. Wuxi (無錫) has done some good job.", Professor Xue commented to the problem of water shortage in the coming days.

With Dr. S.P. Neuman in 2002

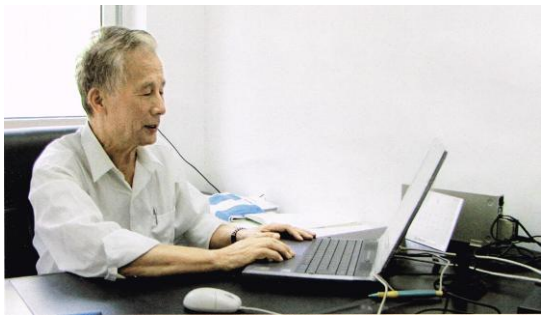
Professor admitted the government did not concern the environment and sustainable development at the early plan of young Republic.

Academic appointments

Professor Xue was the Vice Director of Curriculum Steering Committee for hydrogeology of Ministry of Geology and Mineral Resources; Assessment Committee member of National Natural Science Foundation of China; Member of Advisory Committee of experts; Editorial broad member of "Hydrogeology Journal"; Member of Science and Technology Committee of Ministry of Water Resources; Honorary director of Hydrogeology Committee of Geological Society of China.

Using manual calculator in fifties, 20th century

Using terminal computer in eighties



Using personal computer in 21st century

Academic achievements

Professor Xue set up a comparable perfect model of "3-dimensional thermal migration" in China in 1986; he also set up the first numerical model of sea water intrusion in coastal phreatic aquifers in China and the way to deal with the situation of sea water intrusion which reduced the speed of sea water intrusion from 20 km^2 in 1989 to recent 1~ 2 km^2 in the coast of Long Kou city (龍口市), China, the model solved the problems of the influence of undulation of water table and rainfall infiltration on water intrusion quality, this model was commented overseas as "development of the model of sea water intrusion under phreatic aquifer condition". Professor has set up a series of models of water volume and water quality whereas seven models including leaky aquifer system are innovative in China. The interpolation method in solving flow speed is also innovative.

International conference on modeling groundwater flow and pollution

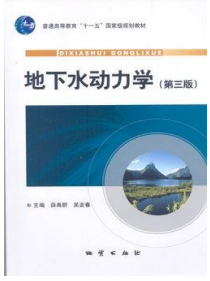
With Professor Johnson in the 7th International Symposium on Land Subsidence

The success of Professor Xue is obviously due to his hard working, his pity for the sufferings of his countrymen and certainly, the demand of the country.

Visit Berkeley, University of California,2003

Excellent textbook writer

The "Numerical method of hydrogeology" authored by Professor Xue is the first numerical book of hydrogeology in China; another book- "Dynamics of groundwater" has been used in China as textbook for more than 30 years which was awarded the "Second prize of scientific technology" from Education Department in 1999, the book has been reprinted for seven times and published three versions.

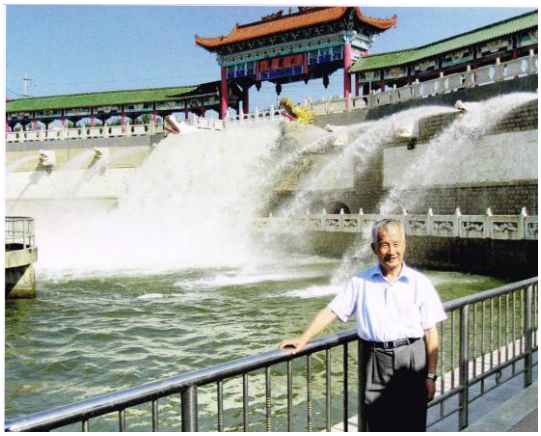


The 2nd and 3rd versions of the excellent book

Prizes

Professor Xue won the first and second prizes of "Outstanding achievement of science and technology" of the Ministry of Education.

Sampling in Yellow river in 1991



Kelamayi hydroengineering in Xinjiang

Major Publications

Some of the textbooks, monographs and treatises as follows:

Dynamics of groundwater, <地下水動力學>, 1979, Geological Publishing House; Numerical method of hydrogeology, <水文地質學的數值法>, 1980, China Coal Industry Publishing House; Principle of groundwater dynamics,< 地下水動力學原理>，1986，Geological Publishing House; The study of sea-water intrusion and transportation principle of salt-fresh water interface <海水入侵、鹹淡水介面運移規律研究>, 1991, Nanjing University Press; Modeling in Groundwater Resources, Nanjing University Press; XUE et al, The evolution of groundwater environment of northern plain of China <華北平原地下水環境演化>，2000, Geological Publishing House; Numerical simulation for groundwater, <地下水數值模擬>, 2007, Science Press.

With more than 150 articles published including 31 articles in SCI and 8 articles in EI journals such as:

Sea-water intrusion in the coastal areas of Laizhou Bay, China－1. Distribution of sea－water intrusion and its hydrochemical characteristics; 2. Sea-water intrusion monitoring, *Ground Water*, 1993; Hydrogeological and hydrogeochemical studies for salt water intrusion on the south coast of Laizhou Bay, China, *Ground Water*, 2000; A thermal energy storage model for a confined aquifer, *Proc. 7th Inter. Conf. on* Computational Methods in Water Resources, MIT, U.S.A., 1988; Numerical simulation of thermal energy storage experiments in China, *Proc. of JIGASTOCK* (4th Inter. Conf. on Energy Storage for Building Heating & Cooling and 3th Inter. Conf. on Applied Geothermics), Paris, France, 1988; Aquifer thermal energy storage: A numerical simulation of field experiments in China, *Water Resources Research*, 1990; A numerical model of sea water intrusion in coastal aquifers, *Proc. of Inter. Conf. on Modeling Groundwater flow and Pollution*, 1991; A study on the numerical simulation of heat transport in aquifers, *Proc. 9th Inter. Conf. on Computational Methods in Water Resources*, Denver, U.S.A., 1992; A three-dimensional miscible transport model for seawater intrusion in China, *Water Resources Research*, 1995; Modeling contaminant transport in a system of leaky aquifers, *Proc. 11st Inter. Conf. on Computational Methods in Water Resources*, Cancun, Mexico, 1996; A study on the water soil interaction in the process of sea water intrusion, *Proc. Of 30th International Geological Congress*, 1997; Logarithmic finite element interpolation of flow near wells in phreatic aquifers, Advances in Water Resources, 1985; A characteristic alternating direction implicit scheme for the advection-dispersion equation, *Proc. 7th Inter. Conf. on Computational Methods in Water Resources*, MIT, U.S.A., 1988; A cubic-spline technique to calculate nodal Darcian velocities in aquifers, *Water Resources Research*, 1994; Application of the multi-scale finite element method to flow in heterogeneous porous media, *Water Resources Research*, 2004; Characterization of regional land subsidence in Yangtze Delta, China: the example of Su-Xi-Chang area and the city of Shanghai, *Hydrogeology Journal*, 2008; Characterization of land subsidence induced by ground water withdrawals in Su-Xi-Chang area, China, *Environmental Geology*, 2008.

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University（南京大學地球科學與工程學院簡史）Nanjing University Press, 2011

Contemporary Geoscientists of China
- YIN, Hong-fu (古生物專家殷鴻福院士)

At Professor's office

Professor Yin was born in 1935 in Zhou Shan，Zhejiang province（浙江舟山）. He graduated from Beijing College of Geology in 1956, and completed his graduate studies in palaeontology and stratigraphy in1961.

Academic appointments

Professor Yin was a member of National Committee of the Chinese People's Political Consultative Conference (CPPCC)；Former President of China University of Geosciences (Wuhan); Vice director of the National Stratigraphical Commission of China; Vice chair of Subcommission on Triassic Stratigraphy of International Commission on Stratigraphy；Chairman of working group of Permian- Triassic boundary; Chief editor of "Frontier of Earth Science"; Editorial board member of "Episodes", "Chinese Science Bulletin", "Science China"；Vice President of Palaeontological Society of China; Chairman of Project 359 of International Geological Correlation Programme; He was elected as Member of Chinese Academy of Sciences in 1993.

"**I am very proud and happy to serve my country as a geologist for life**"，he wrote in an article to newspaper in 1953. Professor Yin has never forgot his words after half century. He never stopped to climb the summit of geosciences, persistent and innovative which resulted in his beautiful life and brilliant career.

Road to master

Professor Yin was the best student of the graduate class of Shanghai Yu Cai High School (上海育才中學) in 1952 at the age of 17. He did not apply for fashionable majors or prevalent universities after high school graduation, instead he applied for the cool course of "Coal Geology" of Beijing College of Geology. He said the urgent target of the new China was to look for geological resources which were demanded for the industry. He studied stratigraphy and palaeontology under the famous academician, Zunyi Yang (楊遵儀) on the bivalves and gastropods in Triassic for his graduate course.

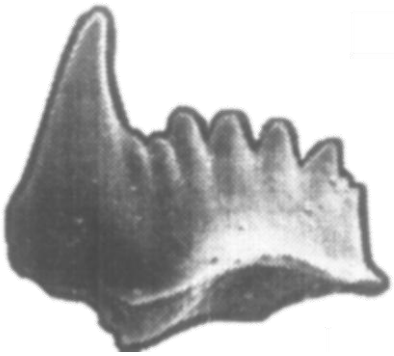
The talent of Professor Yin was shown in his graduate dissertation in 1961 in which he established the Triassic biostratigraphic framework of Guizhou, he challenged the traditional correlation

of Leikoupo (Badong) (雷口坡，巴東) formation to Ladinian epoch and amended it to Anisian epoch. He also fixed the Jialingjiang (嘉陵江) formation be Early Triassic. The time scale has been used up to now.

The concept of "knowledge is useless" was popular during Cultural Revolution, he saved money from his meagre earnings to do research. He received RMB 65 salary per month at that time. He gave RMB 25 to his parents and left RMB 40 as living allowance with his daughter and research fund for taking photos from the library. In fact, Professor Yin did not squander any time in Cultural Revolution, he learnt English, German, Russian and French by himself, he took down several tens of notes, thousands of academic cards and photos, that is why he was able to publish more than ten articles immediately after Cultural Revolution. Professor Yin studied in U.S.A. during 1980-1982 and published 6 SCI articles.

GSSP of the Permian-Triassic Boundary

Based on laborious works on more than 30 sections in whole South China and careful correlation with important Permian-Triassic boundary sections over the world, Professor Yin proposed to use *Hindeodus parvus* (微小舟形牙形石) as the boundary marker for the beginning of Triassic instead of *Otoceras* （耳菊石） in 1986.



Hindeodus parvus (牙形石)

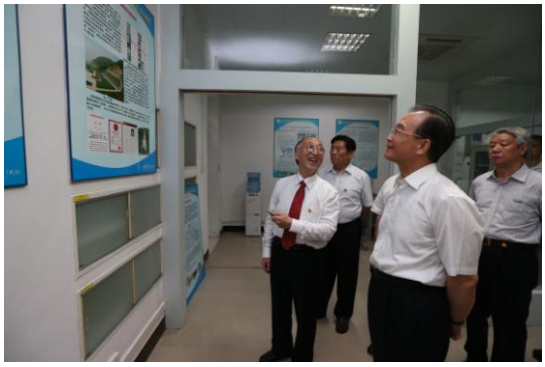
This proposal received worldwide support in the academic circle of Permian-Triassic stratigraphy. He was elected as chairman of the international Permian-Triassic Boundary Working Group in 1993. In 1996, together with other 8 members of the Working Group he recommended the Meishan (煤山) D section of Changxing, Zhejiang Province as the Global Stratotype Section and Point (GSSP) of the Permian-Triassic Boundary, which was ranked as the first candidate based on excellent researches made by him and his colleagues.

The GSSP at Meishan

Natural relic preservation zone, 2005

After a long and difficult process plus 3 runs of ballot, a good news was announced by International Union of Geological Sciences that Meishan D section of China was confirmed to be the GSSP of the Permian-Triassic Boundary in March 13，2001. The GSSP is also called "Golden Spike (金釘子)". Establishment of a Golden Spike

means that the study of the stratum in that area has achieved international leading level in that geological interval. Nevertheless, it was through the effort of Professor Yin and his group.



Introducing "Golden Spike" to Premier Wen

Academic achievements

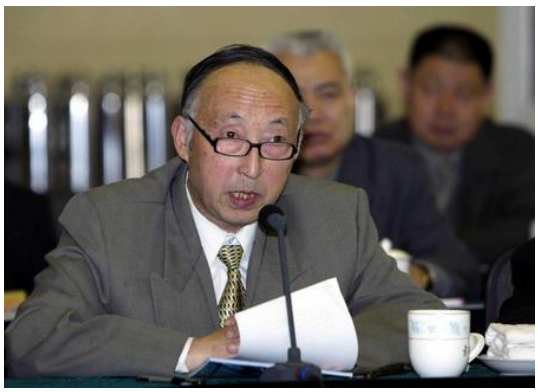
Ecostratigraphy

Professor Yin was the chief author of the first Chinese monograph of ecostratigraphy, "Dongwuan-Indosinian (late Permian-middle Triassic) ecostratigraphy of the Yangtze region and its margins" 〈揚子及其周緣東吳-印支期生態地層學〉in 1995, the book depicts a complete systematic methods and analysis of ecostratigraphy and applies it in Yangtze region for Permian and Triassic periods. It displays a new way of stratigraphic correlation in Yangtze region. It also reveals precise regional sea level changes during that time interval.

Home coming of Premier Wen, Jia-Bao to his alma mater

Biogeology

Professor Yin is among the pioneers who ponder on the future of paleontology. In 1984 he wrote an essay "Paleontology should rejuvenate through all-round service to other disciplines" (古生物學要在全方位服務中煥發青春), in which he proposed that paleontology should serve and integrate with geosciences and environmental sciences to gain a lease of life. It should enlarge its scope of research from macro-fossils to geo-microbes, because it is the geo-microbes that can remarkably influence environments, such as oxygen production, carbon circle, fossil fuel accumulation and contamination etc.



Since last eighties, Professor Yin began to integrate geo-microbe activities with metallogenesis in his biometallogenesis researches. He and his group demonstrated the role of geo-microbes and their organic derivatives, especially organic fluids, in the metallogenesis of gold, zinc and lead deposits in Sichuan, Ganshu, Guangxi and Jiangsu Provinces. Based on long-term field and laboratory works they set forth the theory of "Organism—organic matter —organic fluid metallogenetic system". This was a complement to the traditional biometallogenesis theory in China which emphasized on stratabound ore deposits of Fe, Mn, P and Al.

Professor Yin maintains to combine the researches of fossils and their environments in earth history. His book on "The paleobiogeography of China", one of the Oxford Scientific Publications, showed the 500 Mya Phanerozoic history of life and geographic-climatic environments in China. Professor Yin was the first one to conclude the South China was part of Gondwana from the view of palaeontology and palaegeography.

Professor is inspecting a rock sample

Gradually, he established the idea of interaction and co-evolution between earth's environments and organisms. he led his group to form a strategy in the development of biogeology in China and began planned long-term research since 1982. In 1994, he published the paper "On biogeology" (生物地質學)，in which he clearly demonstrated that the future way leads to cross discipline of biosciences and geosciences. Later, he published the book "Biogeology" (生物地質學) which targets on the co-evolution between the earth's environment and organism（Yin Hongfu，1994；Yin Hongfu et al， 2004）. After 26 years since the beginning of biogeology researches (including also biometallogenesis, paleobiogeography and ecostratigraphy) , he and his group won the National Award on Natural Sciences in 2008. Simultaneously, a new discipline 'Geobiology' (地球生物學) was established internationally as an intergrated part of the earth system sciences. So since the beginning of this century Professor Yin led his group to work further on this developing discipline. They proposed the preliminary system of geobiology, organized several forums on this topic, sponsored two international meetings on biogeology, introduced basic concepts of biogeology for several strategic research books on geosciences hosted by Academia Sinica, NSFC and AST of China, and took charge of the program 'Strategic research on the development of biogeology' set forth by Academia Sinica. His research group on biogeology was chosen as one of the Innovative Research Teams of NSFC (2007-2012) and a base of 111 Plan (2008—2017), It also constitutes the main force of The State Key Laboratory of Biogeology and Environmental Geology.

"**'Long as might be the road, keep searching above and below I would'** （路漫漫其修遠兮，吾將上下而求索）- (QUE, Yuan, 屈原). A scientist should pursue for what he pondered as the right way, regardless of the time and cost to be spent,

and no matter whether he will obtain the final result in his lifetime". It is by such insistence that even after he was elected an academician, he got three National Awards on Natural Sciences (1999, 2002, 2008). According to statistics, only 4 living members of Academia Sinica have been awarded as many as 3-4 times since their election as academicians.

Affection for the motherland

His friends and an oil company persuaded him to stay in America after his two years study, but the offer was rejected by Professor Yin, his friend warned him saying, "China is a big wheel of large inertia, be care to be flattened", he replied, "Anyway, it needs someone to push this wheel". He further elaborated, "I am a Chinese, I study Chinese geology, my career is in China; I am the master in my country, I am proud and responsible for my country.

Teaching attitude

"Science being practical and realistic, how can I convince others to trust my conclusion if I have not collected any reliable evidence from the field ?", Professor Yin said. He travelled through the snowing Tibet-Qinghai Plateau, the misty and rugged Gobi desert, Qinling（秦嶺）and Qilian Mountains（祁連山）. No matter how far the road, or how high the mountain, we can see his footprints. He hurt his knee at the age of 50 when he climbed the Min Shan (岷山) which is 4,000 meters high, everyone believed he would not visit the field again, however he was seen again in the midst of mountains after one year therapy.

"Moral is not everything, but non moral is not allowed!" (精神不是萬能的，但沒有精神是萬萬不能的!), Professor says to his students.

With foreign students

The State Key Laboratory of Biogeology and Environmental Geology in China University of Geosciences (CUG, Wuhan), which was founded under the effort of Professor Yin and his group, is now the leading base of biogeology research in China. The 'paleontology and stratigraphy' discipline of CUG was evaluated as no. 1 among the same discipline of all Chinese universities. Professor Yin admitted their research center is not the best in Chinese paleontology and stratigraphy but probably among the top three.

The Professor is so humble, simple, articulate, humour and amiable which won him a nickname of "grandpa" from his students.

Conferring doctorate degree to
a foreign student

Professor Yin said China is inferior to America in talent training. China produces

"high IQ, non creative" talents. The knowledge training is not everything, China has no comparable talents as Bill Gate, Steve Paul Jobs.

His students in class

Professor Yin has supervised 5 post doctoral students, 35 doctorate students and numerous masteral students.

Support from his family

"A woman is always behind a successful man", this is quite right for Professor Yin, his wife, Ms HU,Yong (胡雍) took over all the family jobs without any regret, the Professor spent most of his time in the fields or academic activities, his wife supported his persistence and vision on geology. They have one son and one daughter.

We would conclude "his love for mountains is forever, he is never too old to learn". His success is derived from his persistent effort to challenge the obstacles of science, or his career to act as a geologist for life.

Prizes and awards

Three items of 2nd class National Award of Natural Sciences, one 1st class and seven 2nd class prizes of Science and Technology progress of Ministry of Land and Resources, two 1st class and two 2nd class prizes of Science and Technology progress of Education Ministry, two 1st class of prizes of Science and Technology progress of Hubei Province, First "Yin Zanxun prize" from Palaeontological Society of China, "Li Siguang Geoscience Research" prize from Geological Society of China, "HO LEUNG HO LEE" prize (何梁何利獎), enjoying special subsidy from government, National advanced worker, Special class working model of Hubei.

Donation for scholarships

Professor Yin had donated RMB395,000 cash to the scholarship of the school during the 60 years anniversary of China University of Geosciences (Wuhan) which came from his cash award from "Golden spike project" and Ho Leung Ho Lee Foundation prize. Besides he also donated a same amount scholarship in 2002. He donated another RMB20,000 for student's recreational center from his cash award of "Guang Gu proposal prize" in 2001.

Major publications

Professor Yin has published 31 books or special issues and 248 articles, some of them are listed below:

On lithofacies and paleoecology of the Triassic of Kueichow Province, China. Scientia Sinica, 1963, 12(8):1169-1196; Uppermost Permian (Changxingian) Pectinacea from South China, Rivista Italiana Paleontologia et Stratigrafia, 1982, 88(3): 337-389;On the Transitional Bed and the Permian -Triassic boundary in South China. Newletter on Stratigraphy, 1985, 15(1):13-27; A proposal to the biostratigraphic criterion of Permian-Triassic boundary, Memorie della Societa Geologica Italiana, 1988, 34: 329 -344; Volcanism at the Permian- Triassic boundary in South China and its effects on mass extinction, Acta Geologica Sinica, 1989, 2(4):

417-431; Early Paleozoic evolution of the Zhen'an-Xichuan Block and the small Qinling Multi-island Ocean Basin, Acta Geologica Sinica, 1996, 9(1):1-15; The palaeobiogeography of China, Oxford biogeography series no.8, Oxford Science publications, Oxford. 1994, 1-370; The Palaeozoic-Mesozoic Boundary--Candidates of the Global Stratotype Section and Point (GSSP) of the Permian-Triassic boundary. China University of Geosciences Press, 1996, 135pp; The Permian-Triassic boundary and global Triassic correlations, Palaeo -geography, -climatology, -ecology, Special issue, 1998, 143(4), 215pp; Permian-Triassic evolution of Tethys and western Circum-Pacific, Developments in Palaeontology and Stratigraphy, 18, Elsevier Press, Amsterdam, 2000, 392pp; Environmental and Biotic Changes during the Paleozoic- Mesozoic transition, Special issue of the journal Global and Planetary Change, 2007, Vol. 55 (1-3), 1-235, Elsevier; An accurately delineated Permian-Triassic Boundary in continental successions. Science in China (D), 2007, 50(9):1281-1292; Discussion on geobiology, biogeology, and geobiofacies, Science in China, 2008, D, 51(11):1516-1524. Geobiological approach to evaluating marine carbonate source rocks of hydrocarbon. Science China, Earth Sciences, 2011, 54(8):1121-1135. Two episodes of environmental change at the Permian-Triassic boundary of the GSSP section Meishan. Earth-Science Reviews, 2012, 115: 163-172

Professor Yin involved in some of the projects as follows:

The Carboniferous-Triassic stratigraphy and metallogeny of middle-lower reaches of Yingze River, State key project, 1990-1995; The evolution of palaeo-ocean of Qinling, key project of NSFC, 1990-1995; IGCP-359 "Correlation of Tethyan, Circum-Pacific and Marginal Gondwanan Permo-Triassic,1993-1997; “The geobiological process of the formation of marine hydrocarbon source rocks”, key project of China Petrochemical Corporation, 2006-2009; Biogeological processes in critical geologic episodes”, National Basic Research Program of China, 2010--

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1. Lai Xulong (賴旭龍), “Eternal love for mountains, endless pursuit for knowledge” (大山情未了，追求無止境);
2. Feng Lifei (馮麗妃)，”Bite the mountains tightly” (咬定青山不放鬆), China Science Daily, 2012/4/9

Petrology of High Island Formation porphyroclastic lava in the Hong Kong Global Geopark by Guangfu Xing

(Nanjing Institute of Geology and Mineral Resources, China Geological Survey Bureau, P.R.China)

Abstract: Cretaceous volcanic rocks of High Island Formation develop magnificent hexagonal volcanic columns which constitute the main landscape of Sai Kung Volcanic Rock Region of Hong Kong Global Geopark. Whether these volcanic rocks belong to lava or pyroclastic rock has long been in dispute. Based on the occurrence of typical porphyroclastic and pearl-rim textures in feldspar and quartz phenocrysts, together with flow structure and felsitic texture in the groundmass, the author identities High Island Formation rocks to be a special extrusive facies lava—rhyolitic porphyroclastic lava.

Key words: porphyroclastic lava; High Island Formation; Hong Kong Global Geopark

Volcanic rocks of the High Island Formation, constituting the main landscape of the Sai Kung Volcanic Rock Region in the Hong Kong Global Geopark, got its name from East Dam of the High Island Reservoir and overwhelmingly distributed around the High Island Reservoir, Kau Sai Chau, Tai Tau Chau, Tiu Chung Chau, Bay Islet, Town Island, Bluff Island, Basalt Island, eastern Shelter Island, southeastern Clear Water Bay Peninsula and most islands east of this peninsula (e.g. Ping Min Chau, Trio Islands, Tsing Chau, Ninepin Group).

High Island Formation volcanic rocks erupted in Cretaceous and were characterized by widespread development of columnar joints forming unique landforms and landscapes in Hong Kong. In past decades, the volcanic rock type of the High Island Formation was still controversial, such as rhyolitic lava (Uglow, 1926; Allen and Stephens, 1971), hypabyssal intrusive quartz porphyry sheet (Ruxton, 1960) or pyroclastic flow ignimbrite (Tam，1971；Tam & Chan，1983；Strange et al.，1990；Sewell et al.，2000).

During seeking to obtain national geopark and global geopark status for Hong Kong Geopark, the author had the opportunity to carry out field investigation and focused mainly on petrological study of High Island Formation volcanic rocks. As a result, it was concluded that these volcanic rocks belong to a special extrusive facies lava—rhyolitic porphyroclastic lava and can definitely be regarded as precious geological relics because they constitute the largest scale rhyolitic porphyroclastic lava columns in the world.

Porphyroclastic lava is a special extrusive facies lava which is transitional among effusive facies lava, subvolcanic facies hypabyssal intrusion and explosive facies pyroclastic rocks so that possesses some petrological features of all the three facies rocks. This type of rocks is widely distributed in the coastal area of Southeast China. Generally, at the latest stage of intensive volcano eruptions, as viscous felsic magmas extrude along the main eruption conduit and can not happen explosive eruption due to the loss of volatiles from the magma chamber, which results in porphyroclastic lavas to effuse to all around and form huge lava dome with mushroom-shape in cross section. Caused by different cooling rates and crystallization degrees, a complete lava dome from the inside out can be divided into granular porphyroclastic lava (pleocrystalline), felsitic porphyroclastic lava (felsitic) and cryptocrystalline/vitric porphyroclastic lava. Due to long-term erosions, only one or two types of porphyroclastic lavas are observed in the field. In addition, porphyroclastic lavas can also form dykes or veins in case of intrusion along fault. Porphyroclastic & pearl-rim texture and uniform petrological characteristics are discriminative features for porphyroclastic lavas. On the margin of the large scale extrusive facies dome, porphyroclastic lavas can transit to effusional facies normal lavas. Porphyroclastic lavas occur to overlie on other strata and as extrusive contact with the wall rocks. Different from common intrusive contact interfaces of intrusions, extrusive contact interfaces are steep and dips inward, i.e. toward the porphyroclastic lavas. These features imply that porphyroclastic lavas extruded through the overlying strata (Tao et al., 1985; Xie et al., 1993; Lu et al., 1997).

The marked characteristics of High Island Formation volcanic rocks are as follows:

(1) Uniform petrological and lithological features

The volcanic rocks are deep gray and massive structure, but grayish red after weathering. They developed extensive columnar joints which have been generally destroyed by later X-type joints (Fig.1a) or by spherical weathering (Fig. 2a), and have uniform mineral composition, texture and structure, such as abundant smoky gray dipyramid β-quartz (~15%）and pink -colored euhedral K-feldspar phenocrysts（20~25%） with a diameter of 2-5mm (Fig.1b). They all are rhyolitic (SiO_2 =74.2~76.40wt%，Strange et al., 1990；author unpublished data). No typical component of pyroclastic rocks, such as vitric fragment and fiamme, occur in these rocks.

(2) Common porphyroclastic texture, pearl-rim texture

One of general mineralogic featuers in High Island Formation volcanic rocks is: phenocrysts are broken and have secondary growth rims which contain fine minerals. For instance, almost all K-feldspar phenocrysts have broken down and crystal-containing overgrowth rims minor (Fig.3, Fig.4a, Fig.5a). Quartz phenocryst also has broken down and appears different extinctions, but can still be restored to its original crystalline shape (Fig.4a). The feature that phenocrysts are broken but not scattered is called porphyroclastic texture, and the feature that phenocrysts capture many tiny crystals into secondary rims during its overgrowth is called pearl-rim texture. The two textures are unique for porphyroclastic lavas.

In southeastern China, there are typical and most late Mesozoic porphyroclastic lavas in Fujian Province where exposes a 150km long, NE-trending porphyroclastic lava belt (Nanyuan Formation) from Youxi County to Zhouning County. Except for more abundant phenocrysts, porphyroclastic lavas in Fujian Province show similar porphyroclastic texture and pearl-rim texture to High Island Formation rocks (Fig, 5b).

(3) General flow structure and felsitic texture

Flow structure consisting of oriented flow bandings can be seen both on weathering surfaces and in the thin sections of the volcanic rocks (Fig.1b, Fig.3a, Fig.4b, Fig.5). Their groundmasses display felsitic texture formed by devitrification of dense flow bandings (Fig.3b, Fig.4a, Fig.6). Thus High Island Formation volcanic rocks should be identified to be lavas.

Effusive facies rhyolites contain fine flow bandings but lack porphyroclastic texture and pearl-rim texture. Explosive facies welded tuffs of pyroclastic flow also show pseudofluidal structure manifested by oriented arrangement of elongated fiammes and plastic vitric shards, which is obviously different from flow structure of flow bandings (Fig.7b). According to comparisons mentioned above, High Island Formation volcanic rocks do not belong to either effusive facies rhyolites or explosive facies welded tuffs.

(4) Transit into effusive facies rhyolites, or appear extrusive contacts at the margins.

High Island Formation volcanic rocks transit gradually to effusive facies rhyolites at their margins observed in Shek Pai Wan - Lung Ha Wan of Clear Water Bay Peninsula and south Big Wave Bay. The rhyolites contain fine flow bandings but without porphyroclastic texture or pearl-rim texture

(Fig.7a).

Extrusive contacts between High Island Formation volcanic rocks and their wall rocks are also seen in many areas. For instance, on northern and southern parts of South Ninepin exist High Island Formation porphyroclastic lavas with well-developed columnar joints and Pan Long Wan Formation (Krp) rhyolitic autobrecciated lavas without any columnar joint, respectively. The contact interface between the two formation rocks is steep (Fig.8), which indicates that the porphyroclastic lavas extruded through overlying autobrecciated lava erupted earlier (Fig. 2b).

Such extrusive contact also occurred between High Island Formation and Pan Long Wan Formation rocks at Lung Ha Wan of Clear Water Bay Peninsula. High Island Formation porphyroclastic lavas transit overall into effusive facies rhyolitic lavas, and Pan Long Wan Formation rocks are rhyolitic lavas with coarse flow bandings. The contact interface between the two formations dips clearly towards High Island Formation rhyolites, and on both sides of the contact interface, rhyolites of the two formations appear totally different occurrences of flow bandings (Fig.9).

In conclusion, the volcanic rocks of High Island Formation are not ignimbrite of pyroclastic origin or hypabyssal intrusive sheet and not overflow facies rhyolites either, but extrusive facies rhyolitic porphyroclastic lava.

Acknowledgement: Dr. David X.C. Li from the Association for Geoconservation of Hong Kong is appreciated for assistances during field work in Hong Kong. Professor Kuiyuan Tao, Dr. Zhuliang Yang, Dr. Jialin Shen, Dr. Rong Chen, Dr. Longming Li and Mrs. Yang Jiang from the Nanjing Institute of Geology and Mineral Resources are thanked for their helpful discussions.

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Editor: The content of the article does not represent the view and opinion of GSHK. A comment on this article will be published in next issue.

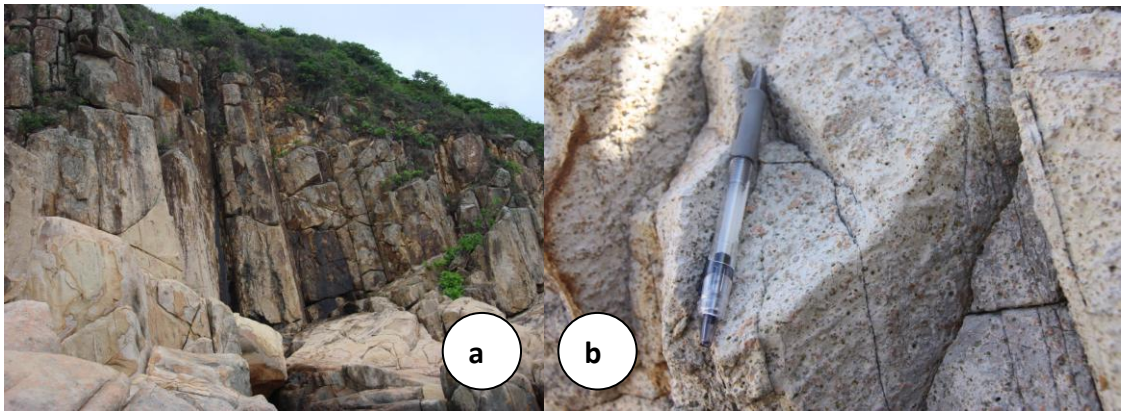


Fig.1 Outcrops of High Island Formation (Kkh) porphyroclastic lavas

Fig.1a Columnar joints in porphyroclastic lava were destroyed by later X-type joints (Bluff Island).

Fig.1b Abundant quartz and K-feldspar phenocrysts and oriented flow bandings exposed on weathering surface of porphyroclastic lava (red circle area) (Shelter Island)

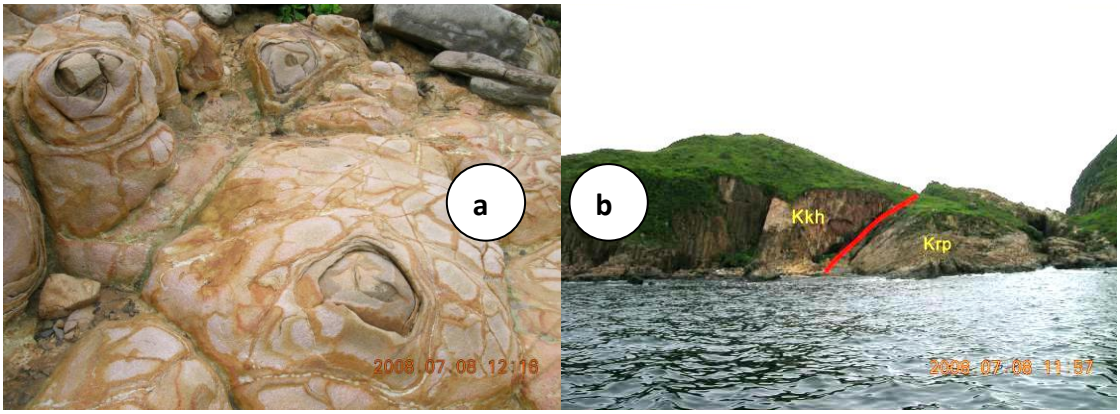


Fig.2 Kkh porphyroclastic lavas and Pan Long Wan Formation (Krp) rocks on Ninepin Group

Fig.2a Spherical weathering of hexagonal columnar joints in Kkh porphyroclastic lava onNorth Ninepin Island.

Fig.2b Extrusive contact interface between Kkh porphyroclastic lava and Krp autobrecciated lava is steep (red line) on South Ninepin Island.

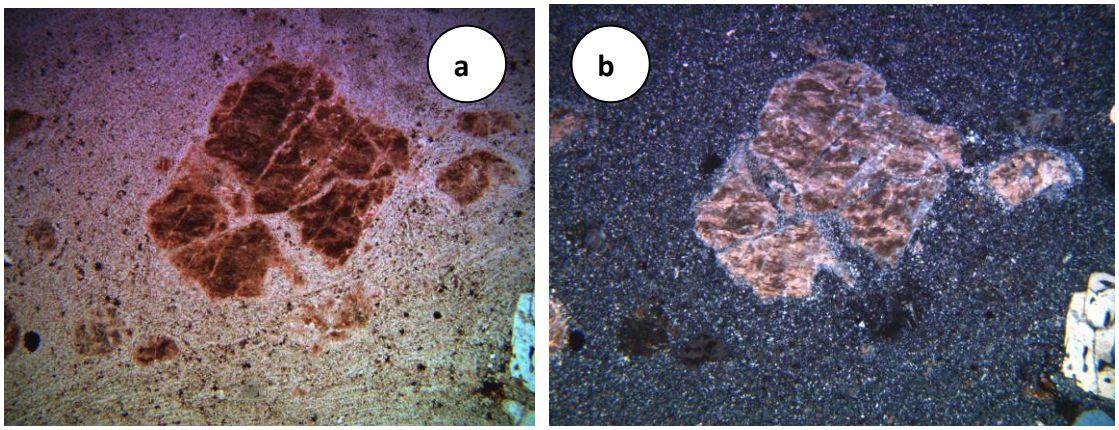


Fig.3 Micrographs of Kkh porphyroclastic lava on Bluff Island

Fig.3a K-feldspar phenocryst with argillizated surface are broken to be porphyroclastic texture, and abundant oriented flow bandings in groundmass of porphyroclastic lava display flow structure (ppl).

Fig.3b K-feldspar phenocryst shows clear pear-rim texture, and flow bandings in groundmass have devitrificated to become felsitic texture (cpl).

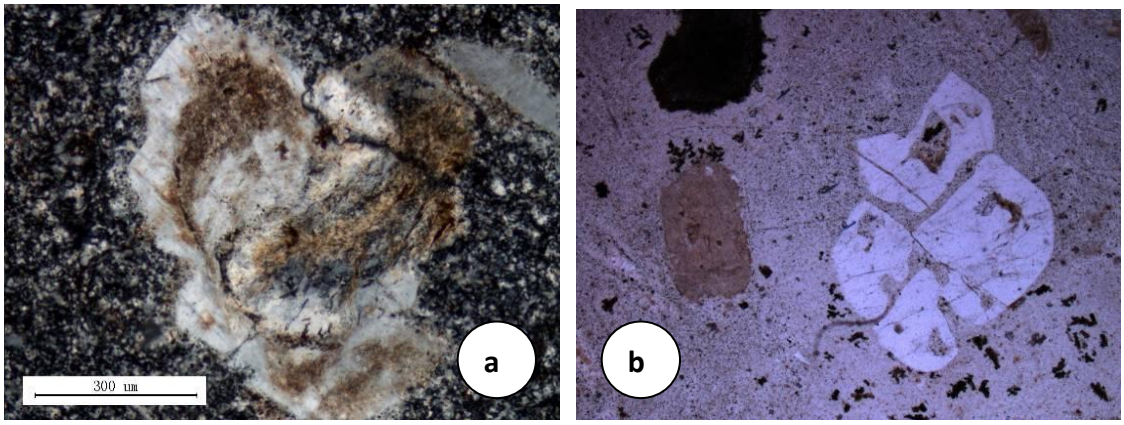


Fig.4 Pearl-rim texture and flow structure of Kkh porphyroclastic lavas (cpl)

Fig.4a Broken K-feldspar phenocryst develops pear-rim texture (cpl, Fa Shan of the High Island Reservoir).

Fig.4b Dipyramid quartz phenocryst is broken to be porphyroclastic texture, and the groundmass contains dense flow bandings to show flow structure (ppl, Pak Pai Wan of Clear Water Bay Peninsula)

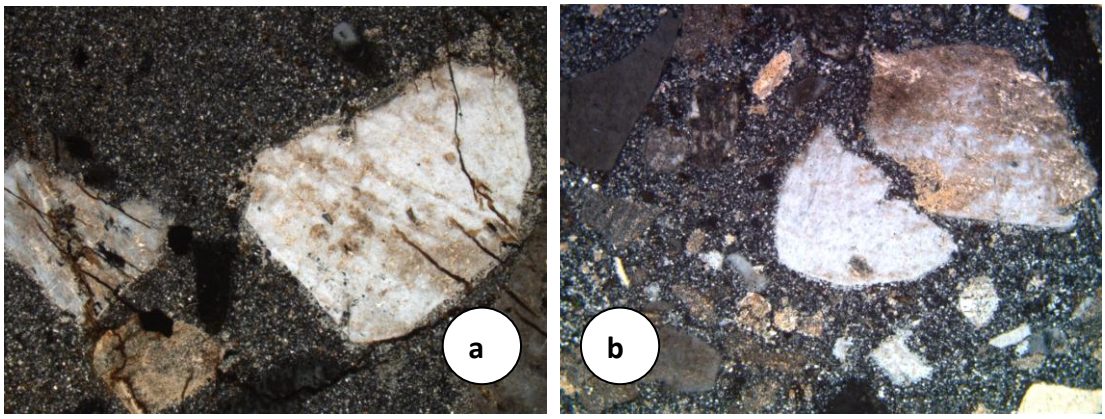


Fig.5 Micrographs of Kkh porphyroclastic lavas (cpl)

Fig.5a Pear-rim texture at secondary dims of K-feldspar phenocrysts and felsitic texture in the groundmass are clear (North Ninepin Island)

Fig.5b Porphyroclastic texture and pear-rim texture of K-feldspar in Nanyuan Formation porphyroclastic lava (Zhouning County, Fujian Province)

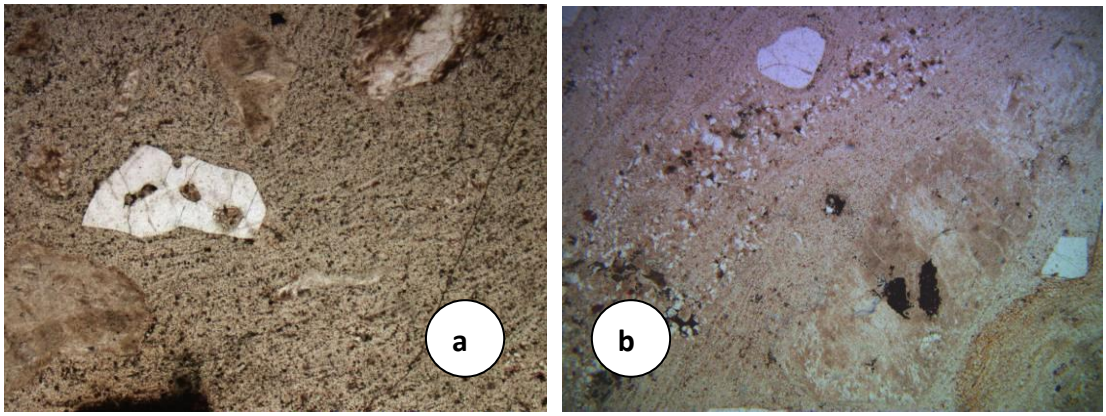


Fig.6 Flow structure and porphyroclastic texture in Kkh porphyroclastic lavas (ppl)

Fig.6a Fine flow bandings in the groundmass of porphyroclastic lava are oriented flow structure (East Dam of the High Island Reservoir)

Fig.6b Flow structure well developed, and the elongation of K-feldspar phenocryst is parallel to flow bandings (cpl, Wang Chau)

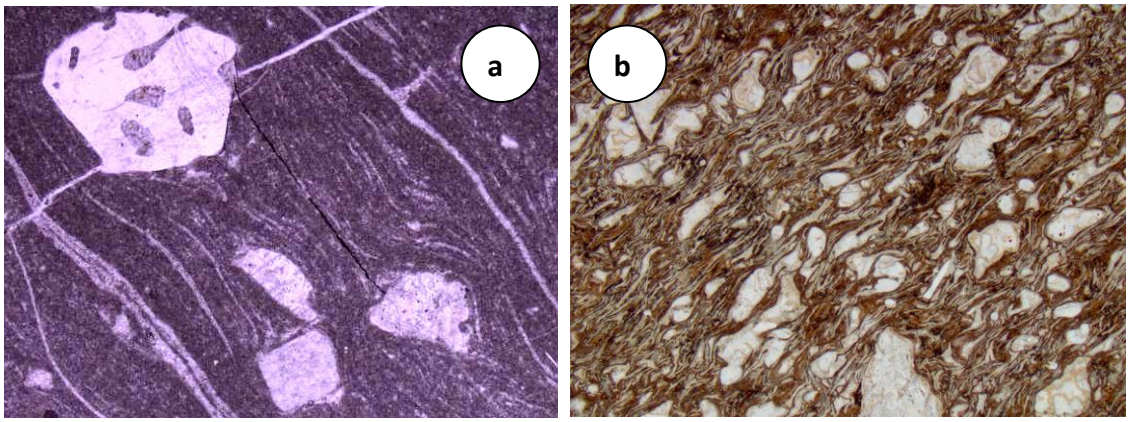


Fig.7 Micrographs of rhyolite and welded tuff (cpl)

Fig.7a Kkh Porphyroclastic lava gradually transit into effusive rhyolitic lava towards its margin, which display typical flow structure but without pear-rim texture (southern Big Wave Bay, Hong Kong).

Fig.7b Abundant plastic vitric fragments in welded tuff have been elongated oriental to become pseudofluidal structure (Zhejiang Province)

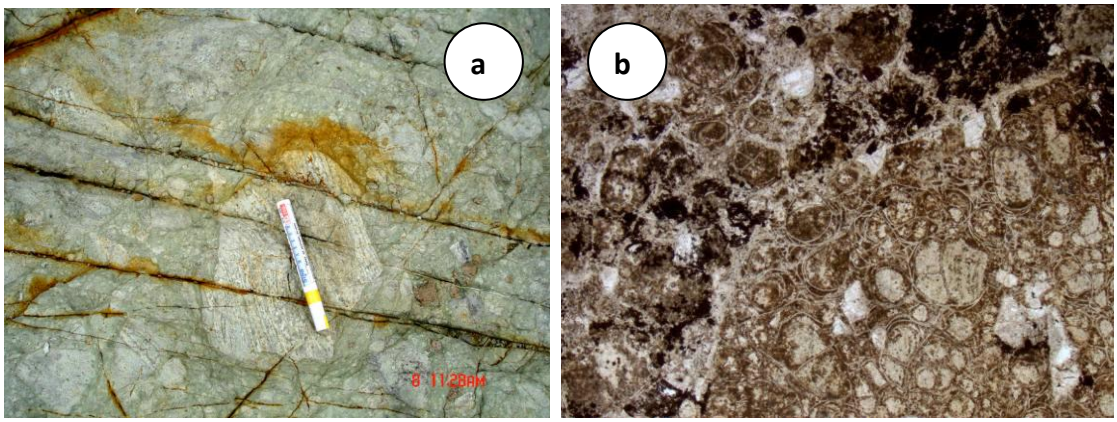


Fig.8 Krp rhyolitic autobreccited lava on southern South Ninepin Island

Fig.8a Both angular breccias and cements in Krp autobrecciated lava are rhyolitic lava in lithology and show clear flow structure.

Fig.8b Both angular breccias and cements are rhyolites in composition and developed well pearl structure which consists of arc contracted cracks formed due to rapid cooling of magmas (cpl).

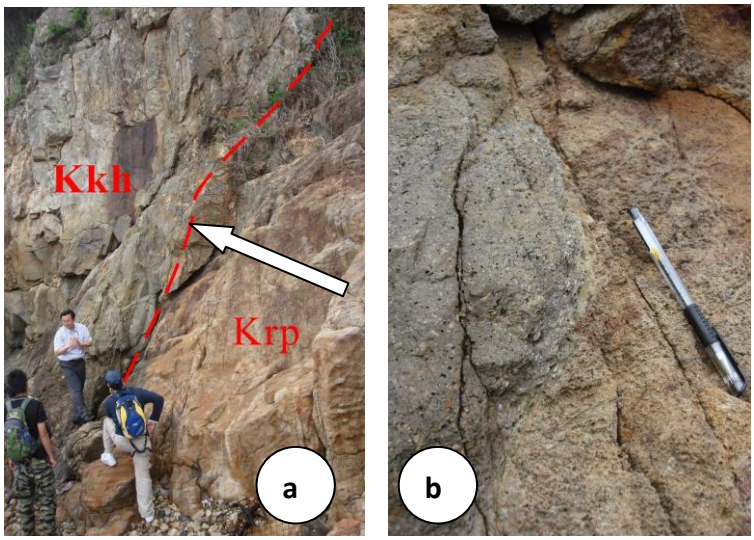


Fig.9a Steep extrusive contact interface between Kkh and Krp formation rhyolites.

Fig.9b Kkh rhyolite has grayish green narrow chilled rim at its margin near interface. The brownish red coarse flow bandings of Krp rhyolites are cut by extrusive contact interface.

Fig.9 Extrusive contact between Kkh and Krp rhyolites at Lung Ha Wan

Notes on the 60-anniversary commemoration of the Geological Society of Guangdong Province

By Nau, Pak Sun, December 2012

Four members (Paul Cheung, CM Lee, KW Lai and PS Nau) of the Geological Society of Hong Kong attended the 60-anniversary commemoration of Geological Society of Guangdong Province on December 7, 2012. There were about 200 delegates attended the commemoration.

Director OU, Zhi Hong of the Geological Society of Guangdong Province addressed a welcome speech at 9am on December 7. Mr XU, Rui Sheng, one of the Leaders of Guangdong Province, gave a significant speech later.

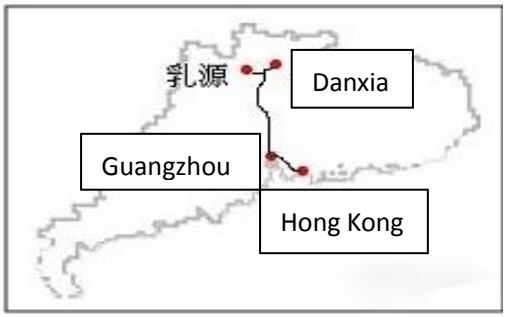
The Geological Society of Guangdong had arranged two field visits which were the global geoparks in the North and West Guangdong. Paul Cheung and PS Nau joined the visit to the global geopark in the North Guangdong (Danxiashan) (this group had 16 persons including the leader, Mr. Lee jianluen, Secretary of the Guangdong Geological Society,). KW Lai joined the visit to the global geoparks in West Guangdong (Hu Guang lake).

The North Guangdong group visited Danxia global geopark, Nanhua temple, Ruyuan canyon and Tianjingshan forest farmin Ruyuan county. Location of Danxiashan and Ruyuan county refer to the map below.

Danxiashan is located at Renhua County, Shaoguan city, Guangdon province. This is the location of the Danxia-landform.

According to Mr. Huang Jin, the definition of Danxia-landform is: the formation of the landform due to water erosion, weathering denudation, collapse and retreat along the vertical joints in the thick bedded, horizontal or gently dipping red/amaranth sandstone and conglomerate of Cretaceous to Paleogene and Neogene age, forming red mesas, stonewalls, stone-pillars with horizontal tops, gentle slopes and steeply dipping cliffs.

Danxiashan is formed by sandstone and conglomerate of Cretaceous age characterized by red walls and cliffs. It was called Danxia mountain in ancient.



Danxiashan, Renhua County (仁化丹霞山)

The red Danxia layers had subjected to the cutting of joints and faults of different directions and also water erosion, weathering denudation to form different mountain shape, such as male and female reproductive organs, elephant crossing river, teapot and kids worship god.....etc.

According to a participant Mr. Yuan ZhongJu (chairman of the Association of ornamental stones and precious stones of Inner Mongolia), "Male organ rock"(a) is not only appear in Danxiashan, but also in Inner Mongolia to be known as "Human root rock"(b).

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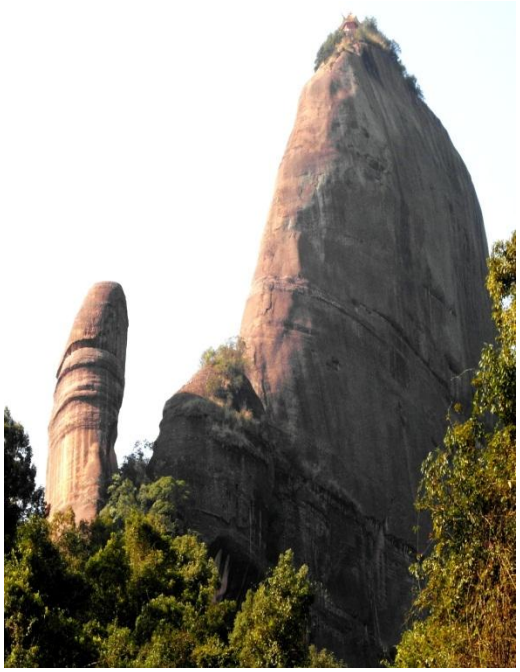
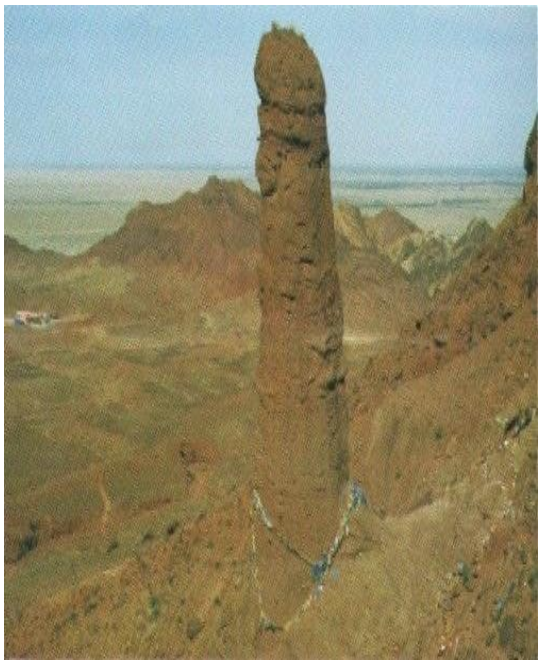
Thanks !



Danxiashan, male organ



Inner Mongolia

Nanhua temple, one of the famous temples in China being existed more than 1500 years, is located at Qujiang district, Shaoguan city. A Buddhist monk called Huineng imparted power of buddha for 37 years in the temple.

We visited the Main Altar of the Grand Hall and Liuzu Altar (a place for worship with the Tang dynasty true body statue of Huineng).

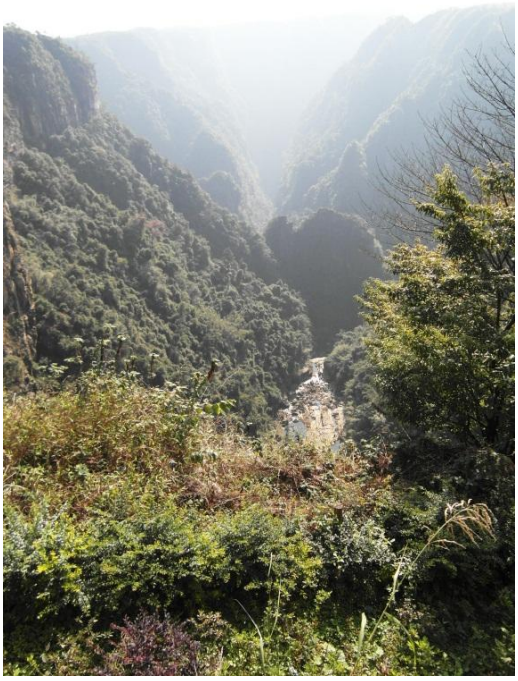
Behind the Liuzu Altar, there are 9 high-raised living fossil plant of Shuisong (*Glyptostrobus pensilis)*which aremore than 300 years in age. One of them is more than 500 years in age.

Shuisong (*Glyptostrobus pensilis)* (水松)

Ruyuan canyon is located at Daibu town, southwest of Ruyuan Yaozu Zizhixian, Shaoguan city.

The rock exposed is gently dipping sandstone. Formation of the canyon is caused by faulting of the strata due to earth movement together with the process of weathering erosion. The canyon is about 300 to 400m in depth. There is a steep staircase leading to the bottom of the canyon. Top of the canyon is topographically flat. The Daibu river flowing down from the top of the canyon forms the Chengkou waterfall about 400m in height. On both sides of the waterfall are high angle cliffs. According to the information, the canyon was formed before 130 m.y. and the length of the canyon is about 15Km.

Canyon Chengkou（埕口）waterfall

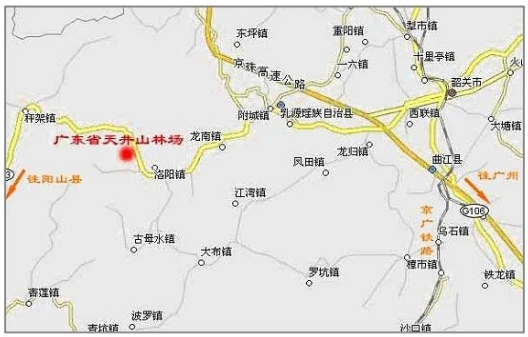


Canyon (埕口瀑布)

Tianjingshan forest-farm (天井山林場) is located in Tianjingshan National Forest Park, Ruyuan Yaozu Zizhixian, Shaoguan city, Guangdong province (see map below). Information reveals that Tianjing

Steep staircase

mountain is, 1000-1700m in height, belonging to the barrier of green ecosystem and is called Guangdong Eco-ridge. On the highest peak of Tianjing mountain there is a naturally formed non-dry-up lake like a dooryard and is the mountain name so called Tianjing, literally “Heaven well”.



In the forest farm, we observed a rock locally called leopard rock (豹紋石) (photo).The photo below shows that there are many round and elliptical cobbles embedded in a light grey rock. The granite located at the lower right corner of the photo has a clear contact with the upper left light grey rock with elliptical cobbles. It was said to be a

phenomena of xenolith. We did not have any comment on the rock due to limit time.

The group returned to Guangzhou on the December 9 at night.

The Preliminary exploration of Pak Lap Fault in Pak Lap Wan area, High Island (Leung Shuen Wan Chau)

By Lin Hoi Yung, Wong Ching Man Crystal

Department of Civil and Structural Engineering,
The Hong Kong Polytechnic University

Introduction

The southeast of the High Island (Leung Shuen Wan Chau) is the Pak Lap Wan. It is one of the most scenic bays along Sai Kung coast which is located beside the headland of Pak Fu Shan.

The rock around the Pak Lap Wan is the High Island formation (Strange et al., 1990). It consists of massive crystal-bearing fine ash welded tuff, with small scale eutaxitic fabrics and well developed columnar jointing (Campbell and Sewell, 1998). Davis et al. (1997) using the U-Pb dating method to detect a single zircon from the rock of High Island obtained the age of High Island formation is 140.9 ±0.2Ma.

Geological investigation in Pak Lap Wan

The field investigations visited two obvious fault zones which exposed at the shore area of the Pak Lap Wan (figure 1 and figure 2). The width of the fault zone one is about 2.5 to 8 m. Fault zone one is corresponded to the Pak Lap Fault of Lee (1990), according to the Lee (1990), the orientation of the fault is NNW. The strike direction of the Pak Lap fault is about NW 330 °. The fault breccias exist in this fault zone (figure 2, plate 2). The orientation of fault zone two is about NW 345 °. Its width is about 3 to 4 meters.

In this area, the manganese oxide, iron oxide and quartz can be found along the joint plane (plate 1), it implicates the hydrothermal event occurred in the past of Pak Lap Wan. On the other hand, the significant geological structures (plate 2) have also been recognized. The pull- apart structure and shear zone structure (plate 2) indicate the strike slip movement. The slickenside stepped structure is also important to prove the fault movement in the past of Pak Lap Wan.

In Pak Lap Wan, two special marine gravels were sculptured by sea water. They were reshaped to an amusing face and a big hollow.

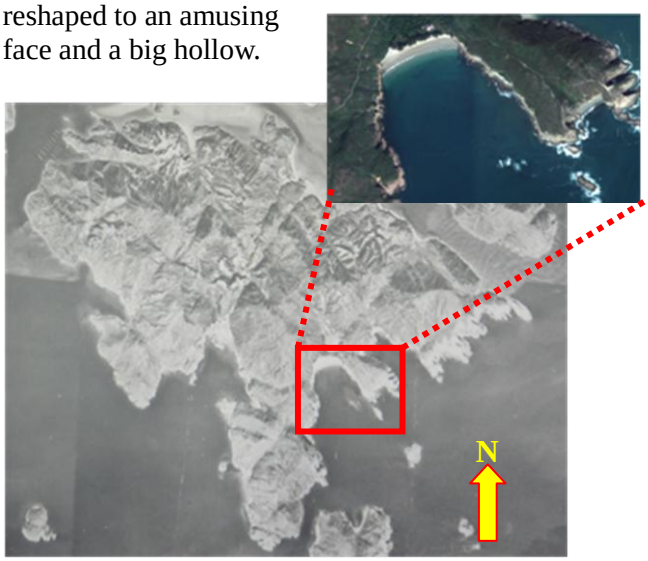


Figure 1: Location of Pak Lap Wan

Conclusion

The Pak Lap fault has been mentioned by Mr. C.M. Lee in 1990. NNW Trend of the fault extends to the Tai She Teng area of High Island and another side trend is extending to the Wong Nai Chau. The Pak Lap Wan area is situated near shore area, the rock suffered the wave erosion. Therefore, part of Pak Lap fault was exposed along the shore line of Pak Lap Wan. It is a good opportunity to investigate and clarify the character of Pak Lap fault.

Figure 2: The two red dash lines are the fault zone 1 and fault zone 2, fault breccias exist at the fault zone 1.

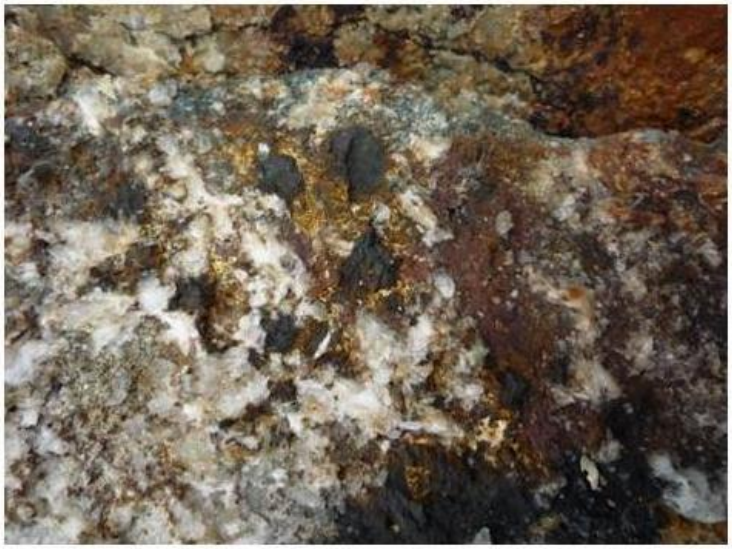
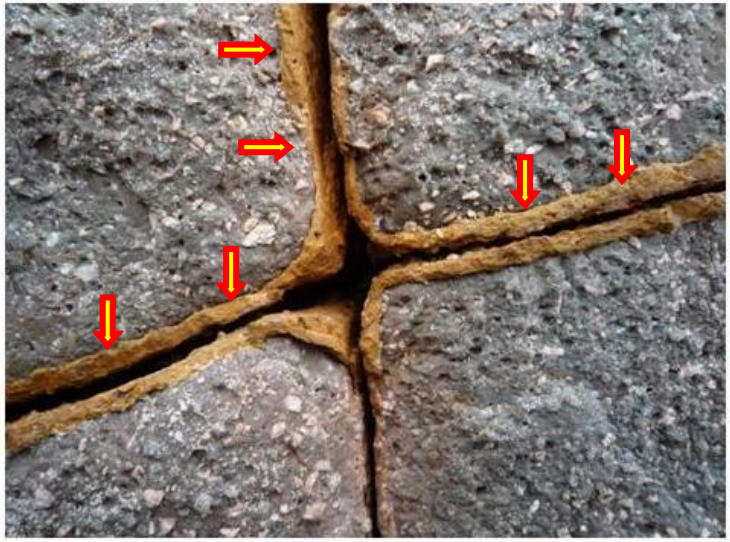
	
A stone contains the yellow concentric circle on the surface. It seems like the mineral (iron oxide) deposit.	The manganese oxide deposit along the rock joint and it was surrounded by the iron oxide.
	
The joint plane of the rock possesses the different minerals include the limonite, quartz, manganese oxide.	The rock joint was eroded and weathered by water to form a smooth sub-rounded edge. The edge was coated with ferrous mineral.

Plate 1: The ore deposit in the joint plane of the rock.

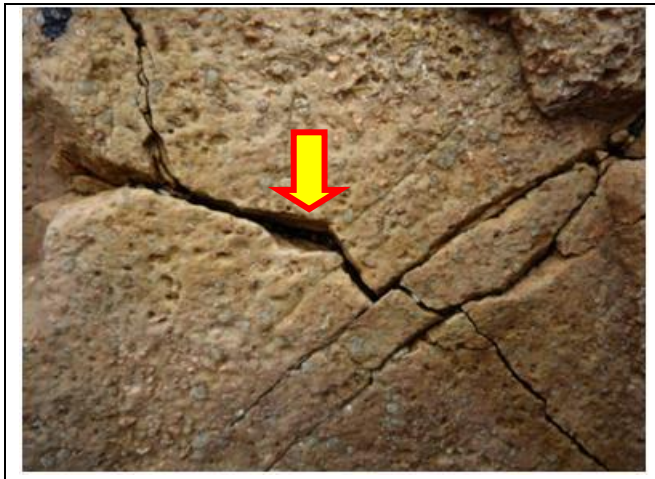
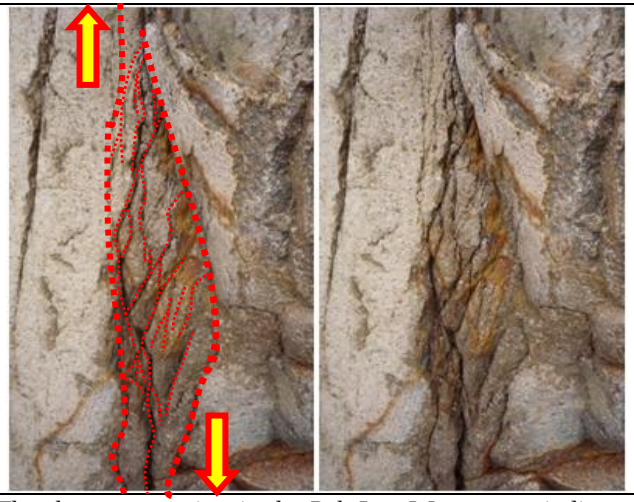
	
When strike slip movement along irregular curved faults produces gaps at releasing bend (Crowell,1974). It is a type of pull apart structure.	The joint plane of some rock possesses the slickenside stepped surface implicates the occurrence of the fault movement
	
The average size of fault breccia fragment is about 5mm-80mm, the fine grained matrix less than 30 percent (Twiss and Moores, 1992).	The shear zone exists in the Pak Lap Wan, arrow indicates the orientation of shear direction.

Plate 2: Geological structure in the Pak Lap Wan.

	
The stone was sculptured by the sea water to form an amusing face.	A stone has a big hollow part seems impacted by the meteorite.

Plate 3: The marine gravel in Pak Lap Wan

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The residual quartz dyke in Leung Tin Au Area implicated a dynamic metamorphism phenomenon by Lin Hoi Yung, Jasim Mohamed Jasim Mohamed Almardi

Department of Civil and Environmental Engineering, The Hong Kong Polytechnic University

Introduction

Leung Tin Au is located beside the Leung King Estate, Tuen Mun (Figure 1). The rock exposed in Leung tin Au belongs to Tsing Shan Granite (152±6Ma and < 159.6±0.5Ma). In Leung Tin Au area, the fault rocks formed by the dynamic metamorphism have been found which included the mylonite, cataclasite, and breccia. They implicate the dynamic metamorphic event in Leung Tin Au area. The deformation of dynamic metamorphism may be dominantly brittle, in which case rock and mineral grains are broken, or it may be dominantly ductile, and in which case plastic behavior and flow occur via structural changes within and between grains (Raymond, 2002). This article also visit to the Tai Lam area investigate the quartz dyke (Figure 1). This intact quartz dyke with thickness of about 80-100cm existed in the Tai Lam area (Tai Lam Granite, 159.3 ± 0.3Ma) along the hill slope of Maclehose trail section 10 near the Harvest Garden, this dyke has not suffered the strong alteration of the external stress (Figure 1). This article focuses on the character of residue quartz dyke of Leung Tin Au. Except the fault rock, the quartz dyke was altered by the same dynamic metamorphism phenomena.

Field investigation

According to the observation and investigation in Leung Tin Au, the quartz can be separated into Quartz fault breccias (Plate 1) and Foliated quartz (Plate 2); they were formed by compressive and shear stress. The quartz fault breccias implicated brittle deformation. It was intruded by the late stage fluid to form the quartz vein and it also includes the tension fracture filled with the quartz crystal (Figure 2) and some quartz vein intruded to iron deposits (Figure 3). On the other hand, the schistose textures were pervasive in foliated quartz (Figure 4 & Figure 5) and it contains the elongated shape quartz grain (Figure 6) which reflects the ductile deform happened in the foliated quartz. According to the investigation, Quartz fault breccias (brittle deformation) and foliated quartz (ductile deformation) are significant evidences to infer the quartz dyke in Leung Tin Au which has been experienced a high stress deformation within a fault zone. Additional, the slickensides (Figure 7) pervaded in the rock fragment surface that are another evidence to implicate the dynamic event in Leung Tin Au.

Quartz dyke deformation process

Based on the preliminary exploration in Leung Tin Au area and Tai Lam area, the article obtained the deformation process of the quartz dyke. An intact quake dyke (similar to the quartz dyke in Tai Lam (Figure 8 & Figure 9) was observed at the Leung Tin Au from an intrusive event. The quartz dyke intruded to the Tsing Shan Granite that suffered the compressive or shearing stress to form the breccia, this movement is induced by a recurrent movement of fault. Therefore the breccia should be classified to breccia series of cataclactic rocks. Due to sizes of breccias from 1 cm to 15cm, the rock name should be breccias (Fault rock terminology, Twiss and Moores, 1992). The quartz was intruded by late period silicon dioxide to form the vein their size is merely few millimeters. Later, the quake dyke was undergone a tension stress to develop the tension fracture, this fracture space was deposited by the new coming silicon dioxide thermal fluid then crystallized the quartz crystal (Plate 1). In the mean time, part of the quartz dyke was deformed by the shearing stress and to be foliated quartz (Plate 2).

Conclusion

Based on the investigation of residual quartz dyke in Leung Tin Au and compare with the intact quartz in Tai Lam. The evidence of the dynamic metamorphism event existed in Leung Tin Au. Quartz fault breccias and Foliated quartz implicated to the brittle to ductile deformation which related to the depth variation of the quartz dyke in Leung Tin Au.

Figure 1: Location of field investigation, intact quartz dyke, and quartz fault breccias and foliated quartz.

Figure 2: Cavity of quartz filled by the secondary quartz deposits and the iron deposits.

Figure 3: The quartz vein intruded to iron deposits.

Figure 4: Side view of foliated quartz fragment

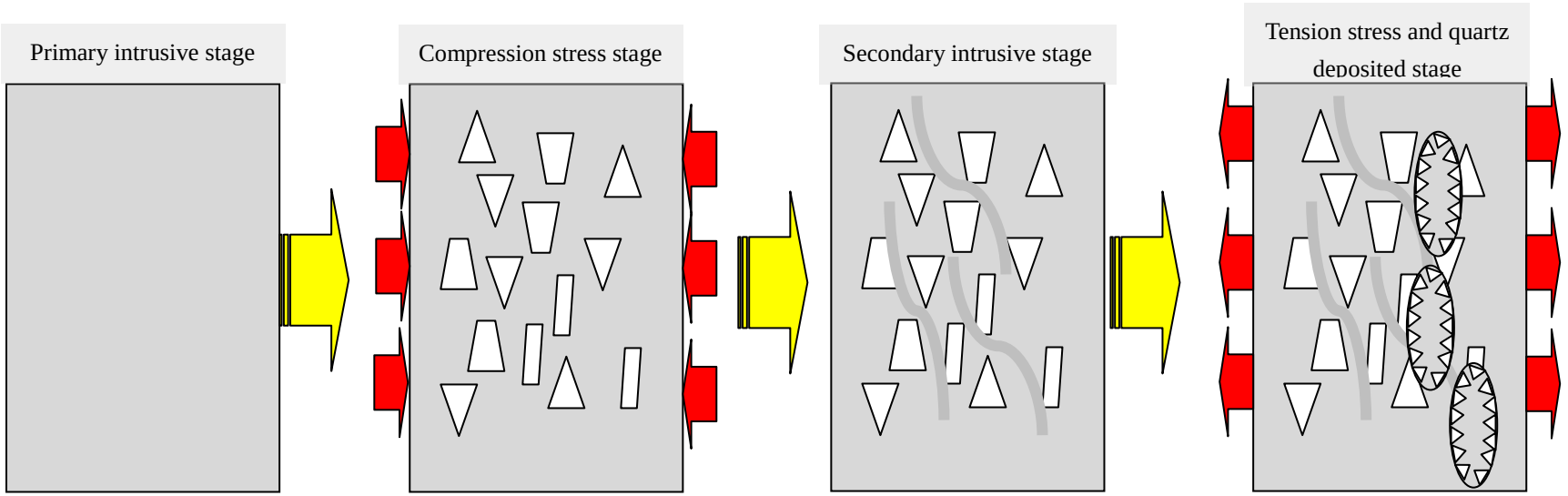
Figure 5: Over view of foliated quartz fragment.

Figure 6: Lenticular shape quartz implicates a plastic deformation.

Figure 7: A rock fragment surface possesses the slickensides [slickensides are the smooth or shiny fault surface themselves (Means, 1987)], it was result of the abrasive action by fault movement and the surface are commonly finely polished slickensided.

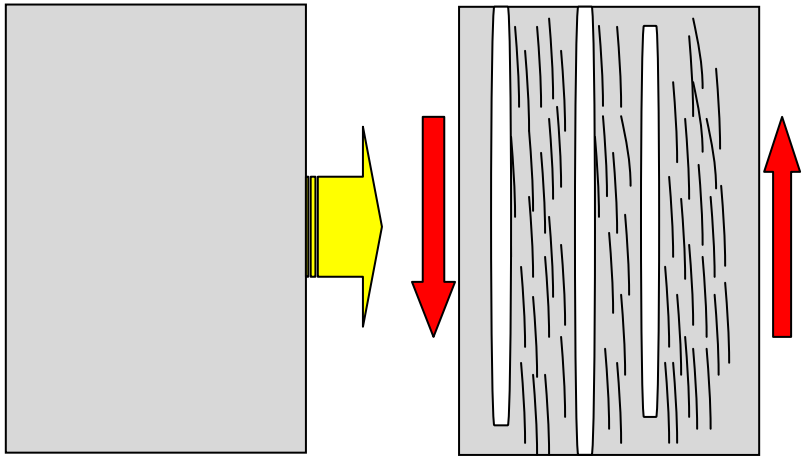
Figure 8: Lower part of quartz dyke in Tai Lam

Figure 9: Upper part of quartz dyke in Tai Lam



			
Intact quartz dyke	Quartz fault breccia fragment	Quartz fault breccias fragment contains the quartz vein	Quartz crystal deposited along the fracture

Plate 1: Brittle deformation of the quartz dyke.



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Intact quartz dyke

Foliated quartz boulder

Plate 2: Ductile deformation of the quartz dyke.

Mr. Xu Rui-sheng, one of the Leaders of Guangdong Province, is giving a significant speech

Mr. Lee Jianluen, the Secretary of Guangdong Geological Society leaded the global geopark trip in North Guangdong (Danxiashan)- Activities of 60th Anniversary of Guangdong Geological Society

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