

Top 10
Hotspots for
GEOLOGY
in Hong Kong

by Geological Society of Hong Kong

直以來,香港予人的印象都是地少人多,人煙稠密。然而,這並不表示香港的自然 環境必然是單調沉悶。實際上,香港有很多獨特的野生動物、植被以及地質特色。這 次,我們打算向大家介紹香港境內十個觀察地質的熱門地方,希望讓讀者明白香港的 地質與香港的自然環境一般,都是同樣精彩。

Hong Kong is well-known for its large population occupying over a small area. However, its small size does not necessarily imply a narrow diversity of natural environment. On the contrary, as more sound scientific researches have been conducted, Hong Kong has been found accommodating a wide range of animals, vegetations and geological characteristics as well. In this issue, we have selected 10 hotspots which appreciably highlight the spectacular geological features in Hong Kong, which tells us how stunning our natural environment is.





Ping Chau

平洲是香港最北面的離島。她那像蛋糕般的多層沉積岩正是她最著名的地質特色。這個小島其實是由很多層不同成 份的沙泥岩所組成的,每一層都很薄。在平洲,其實已發現了不少植物的化石,表示當地的沉積岩差不多是全香港最 年青的,在古新世才形成。值得注意的是,這些一層層的沉積岩並不是橫在水平面,而是以十至二十度向島中心傾斜。 這樣令平洲看起來就像一彎新月。

當你沿著海岸線走時,你會經常遇見不同的海岸地質特徵,如在更樓石附近的海蝕平台。在這個海蝕平台附近,更 可找到不少三角形的潮池。最令人驚訝的是,在這些生存環境那麼惡劣的潮池中,原來也長著不同的小生物。在這裡, 不同的動物與植物和諧的共存著,造成一種特別的生態系統。



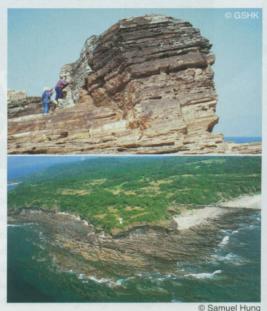
另外,在平洲你也不難發現一些特別的建築物:一些由沙泥岩建成的房子。這些 房子都是由當地居民就地取材興建的。在碼頭旁,你會發現一些金字塔形狀的柱子。 它們約一米高,由一些有稜有角的石塊堆砌而成。在晴朗的日子,這些柱子與藍天白 雲組成了一幅絕美的圖畫。可惜,強風、大浪和一些不小心的遊人都會一次又一次的 破壞這些獨特的柱子。這種特別的沉積岩,全港就只有在平洲找得到。

Ping Chau, the most northern outlying island in Hong Kong, is doubtlessly most well-known for its multi-layered sedimentary rocks resembling home-made layered cakes. The Island comprises numerous successions of thinly-bedded siltstone with varying composition. Abundant plant fossils indicate that the sedimentary rock of Ping Chau is the youngest unit in Hong Kong, formed during the Paleocene. These sedimentary layers in general are not flat-lying but gently tilting towards the centre of the Island at 10° to 20°. This largely results in

the crescent shape of Ping Chau. Walking along the shoreline, you will repeatedly encounter various coastal features such as the remarkable wave-cut platform near Keng Lau Shek. Beside such large wave-cut platform, there are also numerous triangular rock pools at Keng Lau Shek. Surprisingly adverse conditions in these rock pools do

not strike away life forms. Different kinds of fauna and flora live in harmony in such rock pools, forming a distinguished style of ecosystem.

In Ping Chau, you may also discover stylish architecture. Insitu siltstone is skillfully employed as wall for village houses. Several one-metre-high pyramid-like pillars that are entirely stacked with angular in-situ rock fragments were set up in adjacent to the pier. Pillars, blue sky and white cloud form a ravishing picture on a clear day. However, strong wind and sea wave together with careless visitors cruelly destroys these lovely pillars again and again. It's very true that Ping Chau is the best and the only place in Hong Kong to preserve these spectacular sedimentary rocks.





沉積岩 Sedimentary Rocks

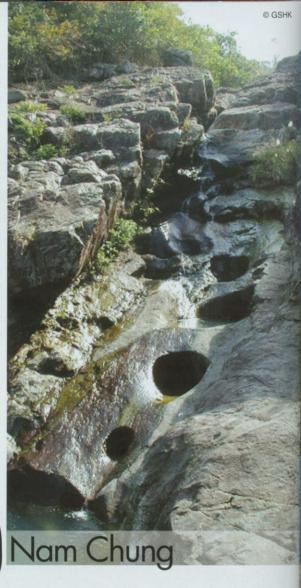
沉積岩是由礦物與岩石碎塊在堆積及擠壓下形成的,岩石中通常都含有 機物質。礫岩就是沉積岩的一種。

Sedimentary rocks are rocks by the deposition and compression of minerals and rock fragments. They often include materials of organic origin. Conglomerate is one kind of sedimentary rocks.

南涌有兩道著名的石澗,那就是屏南石澗與屏嘉石澗。屏南石澗 是香港九大石澗之一,澗內有不少大型瀑布。屏嘉石澗則沒有那麼著 名,也較難去到。雖然如此,屏嘉石澗也有不少慕名而來的訪客,因 那裡有很多水潭及壺穴,故在地質界來說,屏嘉石澗是較馳名的。

在屏嘉石澗的下游,遊人會遇見五個 1-1.5 米寬的圓型壺穴。這些壺穴平均排列在一個四十米高的瀑布附近。那壺穴是怎樣形成的呢?這大多是被轉動不停的漩渦及澗內石頭磨蝕白堊紀礫岩所造成的。然而,最近的地質研究則指出壺穴其實可能是由與壓力有關的分解過程所造成的,令它們更容易受到侵蝕。要觀賞這些地質奇景,就不要錯過遊覽屏嘉石澗。

There are two famous streams in Nam Chung, namely Ping Nan stream and Ping Jia stream. The former is one of the Nine Great streams in Hong Kong and has long been famous for its sizeable and numerous waterfalls. Although Ping Jia stream is less well known and less accessible, it earns its reputation by abundant water pools and peculiar potholes. That is why Ping Jia stream is geologically more renowned. Along the lower course of Ping Jia stream, you will encounter five 1 to 1.5 mwide and spectacularly round potholes. These substantial potholes, spacing evenly, are aligned in a fairly straight line near a 40 m-high waterfall. Pothole origin has been widely attributed to the continuous rotation of grinding stone and vortices on rock (Cretaceous conglomerate here). However, some latest researches favor the theory that potholes were probably formed by a pressure-related disintegration process and were subsequently exposed by erosion. To watch these geological features, Ping Jia stream is truly not to be missed.





Locally known as "Fong Wong Shan", Lantau Peak is the second highest mountain (934 m) in Hong Kong, attracting numerous enthusiastic trekkers and campers for its stunning sunrise every weekend. People heading for watching sunrise on Lantau Peak usually stay overnight in the hostels on Ngong Ping Plateau, and then set off to Lantau Peak very early in the morning. Besides sunrise, Lantau Peak is also celebrated for its distinguished geological features. Near Nei Lak Shan, you can easily find some uncommon structures such as complex flow banding on the surface of lava blocks. These wavy bands are the residual trace of hot lava flow which finally solidified. Although these blocks may not be in-situ, their presence points out a nearby volcanic eruption once in the geological history.

鳳凰山,是全香港第二高的山峰(934米)。不少遊人都對鳳凰山趨之若驚,每逢假日,不少遊人都前往遠足或露營,期望在鳳凰山頂看到日出。他們大都留在昂平高原的旅社過夜,至清晨便出發往鳳凰山頂。然而,除了日出,鳳凰山的地質特徵也是享負盛名的。接近彌勒山處,你可找到一些奇特的地質結構,如在火山岩表面上的流紋構造。這些波浪紋的紋理就是在熔岩冷卻凝固後所形成的。雖然,這些火山岩可能不是原產於本地,但卻顯示在地質史上,附近曾發生過火山爆發。

Lantau Peak





馬屎洲因著她獨特的地質結構,已被漁護署劃為特別地區。同時,漁護署也在那裡 設立了一道自然教育徑,在徑上設有不少關於地質的解説牌,故此不少地理科老師及學 生都愛在馬屎洲舉行野外考察。

組成馬屎洲的岩石主要是沉積岩,它們早在二疊紀便已形成了。已變型的沉積岩令 我們更明白大自然怎樣把岩石改變成不同的形狀。在馬屎洲,摺曲了的石層、斷開和錯 動了的石層都隨處可見。這些都證明活躍的構造運動曾經發生,造成馬屎洲今天的地貌。 雖然構造運動現已不再活躍,但另一個活動 --- 沉積作用卻仍在進行中,因此造成連著馬 屎洲與鹽田仔的連島沙洲。這一切一切,都令馬屎洲成為地質考察其中一個重要的自然 教室。

a Shi Chau

Agriculture, Fisheries and Conservation Department has established Ma Shi Chau as a Special Area for its fantastic geological features. Furthermore, a Nature Trail is also set up with on-site geology description within the Special Area. Undoubtedly, it has been a hotspot for teachers and students to hold their geological field trip.

The geology in Ma Shi Chau is dominated by sedimentary rocks

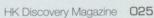
which were formed during Permian. Complicated deformation of sedimentary rock allows us to perceive how the nature shapes rock into various forms. Folded layers, fractured or

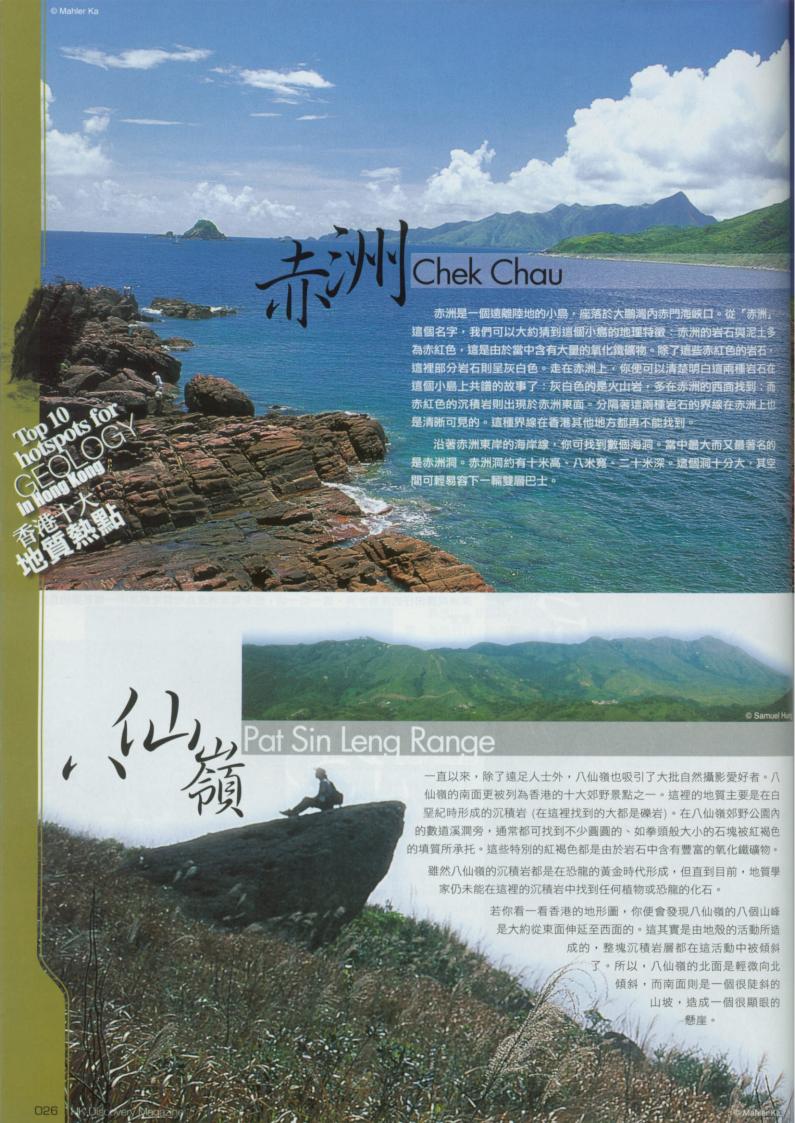
displaced rocks are commonly seen. All these features record the once active tectonic movement in Ma Shi Chau. Although the tectonic movement seems to be inactive now, there is another ongoing process - the sedimentation of the tombolo adjoining Ma Shi Chau with the nearby island Yim Tin Tsai. Ma Shi Chau is indeed imperative for geology amateurs.

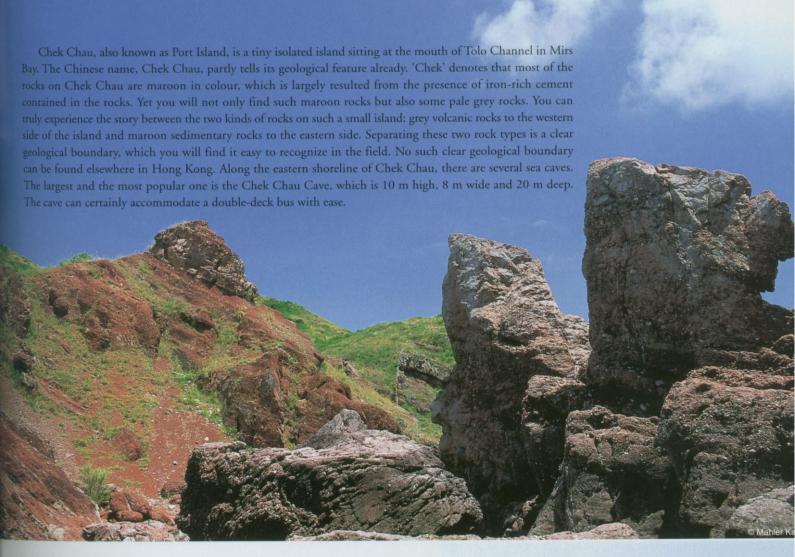


泛指岩石上破裂面兩側發生肉眼可見的相

A fracture in a rock along which observable relative displacements have occurred between adjacent blocks.







Pat Sin Leng Range has been a popular hotspot not only for trekkers but also for photographers. Its southern flank has even been included in the Top Ten Scenery in Hong Kong. The geology is dominated by the Cretaceous sedimentary rocks (mainly conglomerate here). Along some streams in the Pat Sin Leng Country Park, you can find some fairly round and fist-sized pebbles sitting in reddish brown matrix. The distinctive reddish brown colour is largely due to iron-rich cement straddled between the pebbles. Though the sedimentary rock of Pat Sin Leng Range was formed during the golden age of dinosaurs, unfortunately these sedimentary rocks don't yield any plant nor dinosaur fossils up to this moment.

When you take a look on the topographical map of Hong Kong, you may realize that the Pat Sin Leng Range with eight peaks is roughly trending in an east-west direction. This was chiefly shaped by the earth movement that resulted in tilting of the entire load of sedimentary layers. The northern flank of the Range is therefore gently dipping towards north while the southern flank is a steep slope, forming a prominent escarpment along the Range.



Po Toi Island

在蒲台島,有甚麼令你留下最深刻的印象?除了海鮮,相信你的答案必然是當地奇特的地形。蒲台島
是香港最南面的海島,島上不少奇形怪狀的岩石如超級大漏斗/黑岩、龍首石、佛手岩及僧人石,都吸引了

不少遊人到來觀賞。 除此以外,蒲台島的地質也是十分特別的。島上有很多獨立外露出來的花崗岩卵石,形成一種嶙峋險 峻的地貌 — 突石地形。這種地形是由於選擇性風化作用發生後,被風化的物質便會被移走,不容易被風化

峻的地貌 — 突石地形。這種地形是由於選擇性風化作用發生後,被風化的物質便會被移走,不容易被風化的花崗岩卵石便剩下來,逐漸變成今天的模樣。 另外,在蒲台島亦可以發現另一種有趣的地質特徵。有些岩石的

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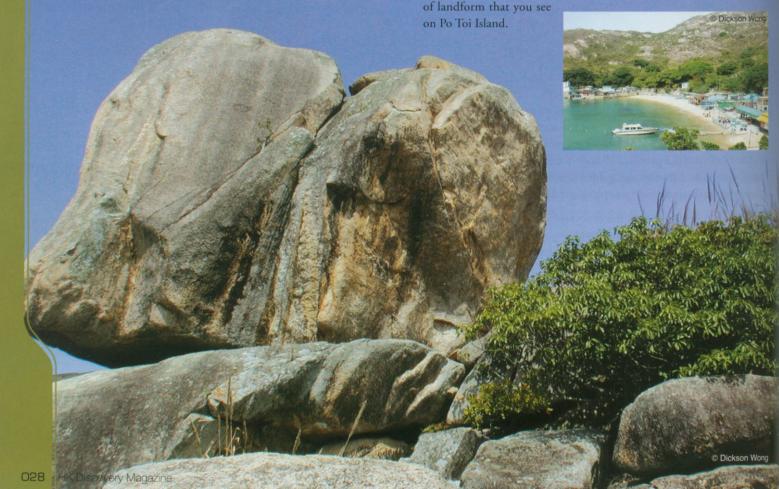
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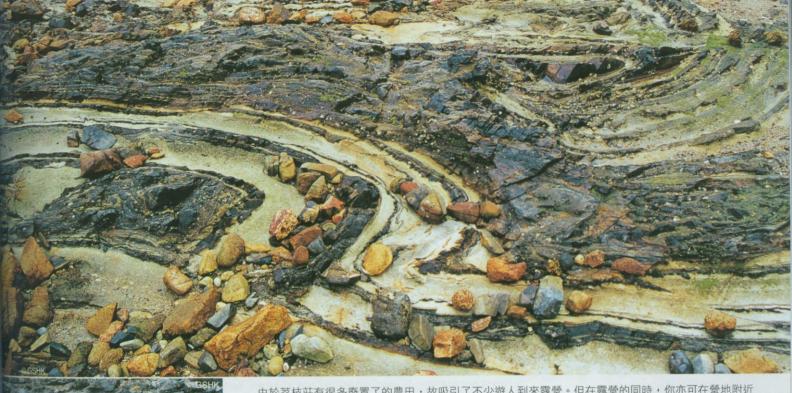
另外,在蒲台島亦可以發現另一種有趣的地質特徵。有些岩石的外層看上去就像是果皮被一層一層剝去了似的,這現象稱為頁狀剝落。突石地形與頁狀剝落都常發生於花崗岩上,所以當你可以在同樣為花崗岩造成的南丫島上看見這兩種地質特徵時,就不必覺得詫異。

When you go to Po Toi Island, what impress you the most? If your answer is not seafood, then it is probably the strange landscape there. Po Toi Island, the southernmost island in Hong Kong, is largely highlighted by various peculiar forms of rock. For instance, the Super Funnel, Dragon's Head, Buddha's hand and Bonze are typical landmarks of Po Toi Island, attracting numerous visitors every weekend.

Apart from these typical landmarks, there are some other features worth picturing. The landscape of the island is characterized by abundant exposed granitic boulders which stand abruptly above their surroundings. This is resulted from selective subsurface weathering followed by removal of weathered materials. The residual boulders subsequently give the present appearance, commonly known as "tor landform".

Another feature of Po Toi Island is that the rock looks like being peeled off in numerous sheets. This sheet-forming feature is formally named as "exfoliation". The tor landform and exfoliation typically develop on granitic rocks. Therefore, you should not be astounded to find that Lamma Island, which is composed of granite, also bears a similar style





由於荔枝莊有很多廢置了的農田,故吸引了不少遊人到來露營。但在露營的同時,你亦可在營地附近進行一些地質考察。當你沿著碼頭旁的海岸線走,最初可能會被看似普通的岩石悶倒。但五分鐘後,就會開始看見一些有趣的事物:傾斜的多層岩石,處於潮間帶的摺曲石層及被錯動了的褶皺。這裡,更可以看到一種頗特別的褶皺——伏臥褶皺。當擠壓持續增強時,褶皺的兩翼將被推至與褶皺軸面平行,形成這種褶皺。在荔枝莊的岩石中,往往都能找到大量火山物質,顯示這些岩石都是與火山爆發有關的。而事實上荔枝莊的火山岩與大嶼山中部的火山岩成份相似,代表著在侏羅紀時,曾有大量的火山活動發生,影響到這兩個地方之間的地質。

是不是很有趣呢?其實在荔枝莊沿著海岸線隨便走半小時已可學習到不少地質上的知識。

<u>Lai Chi Chong</u>

Lai Chi Chong is doubtlessly popular for campers because of substantial abandoned field. Yet when you do camping there, you are advised to spend some time next to the campsite. Try to take a walk along the shoreline adjacent to the pier. At the very beginning, you will probably feel bored with the ordinary rocks. But after another five minutes down along the shoreline, you will soon start to get excited. The layers of rocks, alike the layered-cake, are tilted. The complexly folded layers lie on the tidal area and are ready for you to trace these curved layers. On some occasions, you will see that these folds are evenly displaced. More specifically, there is a peculiar fold called "recumbent fold" for which the limbs are almost parallel to each other due to a severe compression. The presence of a large proportion of volcanic materials in these

layers indicates that the rocks were formed from the processes of volcanic eruption. The volcanic rocks in Lai Chi Chong in fact are currently correlated with those in central Lantau Island based on their compositions, suggesting a considerable lateral extent of such a volcanic eruption during the Jurassic.

Just a 30-minute casual walk along the shoreline in Lai Chi Chong is equivalent to an informative lecture in geology.



在一般人眼中,岩石可能是很普通的物質。但事實上,岩石也可以為我們帶來無盡驚喜。這就要看你有沒有耐心去觀察和研究這些岩石了。今次所介紹的十個地質熱點就能告訴我們怎樣從看似無甚特別的岩石中發掘出趣味。所以,當你下次往郊外漫步、遠足或露營時,不妨對你所踏著的石頭多加留意。若你多運用想像力,你可能會為我們解開一些地質之謎呢!在未來的數期裡,「香港地質學會」將會在野外動向為大家揭示香港整體的地質結構,以及在郊外常見的岩石種類。

Rocks can be very ordinary, yet can be very extraordinary. It very much depends on how you investigate them. The above selected 10 hotspots simply illustrate how the extraordinary fun comes out from the ordinary rocks. So next time when you do your walking, hiking or camping in the countryside, remember to spend some time on what you are stepping on. Perhaps, you may unearth, with your imagination, the answers to some long-lasting puzzles for us. In the coming issues, the Geological Society of Hong Kong will discuss with you on the general picture of Hong Kong geology and some rock types that you will commonly encounter in the countryside.



有關香港地質學會 About the Geological Society of Hong Kong

香港地質學會是一個非牟利的學術團體,成立於一九八二年,旨在推動本地的地質研究;以及定期舉辦研討會,讓本地與外地地質學家能進行學術交流。香港地質學會也有出版一份通訊,名為 "Geosphere",內裡會刊登學會的最新動向,也有介紹不同的會員活動。另外我們也有出版一份學術期刊 "Hong Kong Geologist",刊登不少有關香港及鄰近地區地質研究結果的文章。香港地質學會也有定期舉辦野外考察、工作坊及研討會,好讓參加者能更認識香港美麗的自然環境,同時亦進行自然保育的工作。除此以外,香港地質學會也會偶然與本地其他地質團體舉辦交流團,往中國大陸考察,包括廣東省東面、青海及西藏。現時,香港地質學會的會員有著不同的背景,當中不少是業餘的地質愛好者,有些卻是地質、地理、地質工程學及土木工程方面的專業人士。

香港地質學會明白香港中、小學生及大學生的需要,故最近成立了一個專為學生而設的屬會, 名為 Nature Explorer,希望藉此引起學生對地質的興趣,又安排一連串的野外考察,富資訊性卻又不 失趣味的工作坊,向學生傳遞自然保育的訊息。今年三月,我們舉辦了一個往西貢萬宜水庫東壩及 浪茄灣的考察,讓學生能清楚觀察到當地特別的岩石。另外於今年五月我們乘船往果洲群島去觀察 那裡大量的柱狀節理及特別的海岸地型。

若你希望了解更多有關香港地質學會,或觀看更多香港境內的奇特地質,請瀏覽我們的網頁 www.geoisoc.org.hk。如有任何關於香港地質的問題,也可隨時電郵我們,電郵地址是 geoisoc@hotmail.com 或 nature_explorer@hotmail.com。

The Geological Society of Hong Kong (GSHK) is a non-profit learnt society founded in 1982 with an ambition of furthering the study of geology in Hong Kong and providing a forum for both professionals and amateurs to meet. It publishes a newsletter (Geosphere), which presents news of events to our members; and a journal (Hong Kong Geologist), which contains research papers and articles regarding geology of Hong Kong and the adjacent regions. The Society regularly organizes various field trips, workshops and seminars aiming at satisfying the special needs of the Society, and exploring the beauty of nature with the commitment to the conservation of natural resources. Geological excursions are occasional, with the assistance from other local geological societies, extending to inland China such as eastern Guangdong Province, Qinghai and Tibet. Our current members come from a wide range of backgrounds, from those

who specialize in geology, geography, engineering geology and civil engineering to those who are simply amateurs to geology.

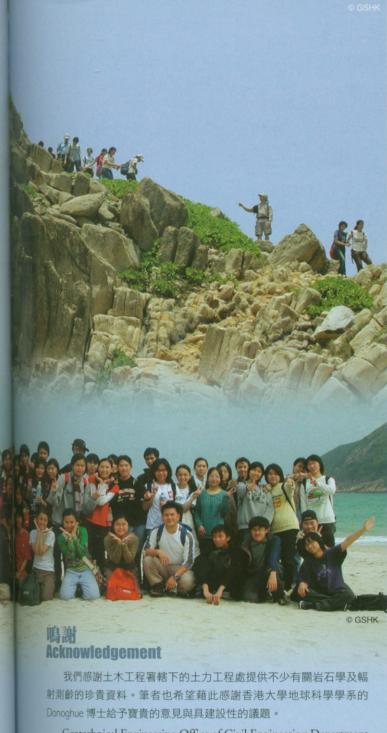
The Society envisages the need of the primary and secondary school students as well as university students in Hong Kong, thus has recently developed an affiliated chapter for student members called Nature Explorer. The goal of such a newly-established chapter is to stimulate students' interest in geology and convey the key message of nature conservation to

the students through a variety of educational field trips, informative and interesting workshops. We have organized a geological excursion in March to the East Dam at the High Island

Reservoir and Long Ke beach where we took a closer look of the spectacular rock type. Another boat trip to Ninepin Islands was held in May, where abundant columnar structures and coastal landform features could be appreciated.

If you want to know more about the Geological Society of Hong Kong, or simply the spectacular geology of Hong Kong, you can visit our homepage **www.geolsoc.org.hk**. Enquiries can also be made to the Geological Society of Hong Kong at **geolsoc@hotmail.com** or **nature_explorer@hotmail.com**.

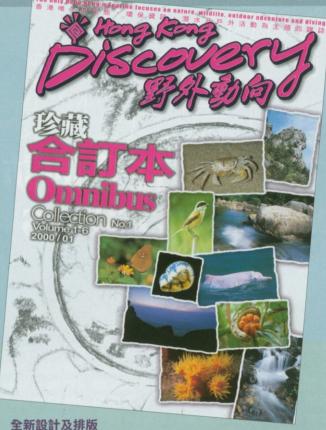




Geotechnical Engineering Office of Civil Engineering Department is gratefully acknowledged for the invaluable lithology information and the relevant information on radiometric ages. The author also wishes to express his appreciation to Dr. Donoghue of the Department of Earth Sciences, the University of Hong Kong for her invaluable advice



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