

你可知道……

- 香港天文台當初成立時，並不是為了預測天氣？
- 台長為什麼由氣候變化的懷疑者，變為倡導者？
- 打風時候，為什麼要有人駐守大帽山雷達站？
- 「代數」源出於哪裡？
- 天文台職員可能是日軍在香港第一批俘虜？
- 千多年前的砂糖呈深黑色？
- 怎樣從天氣圖窺探政局的變幻？
- 哪一種天氣是最大殺手：颱風？暴雨？閃電？酷熱天氣？
- 預測颱風——為什麼有時人腦勝電腦，但有時電腦可以預測到颱風九十度轉向？

答案及詳情請看「台長網誌」。

Do you know……

- The Hong Kong Observatory's original mission was not to forecast the weather?
- How the Director turned from being a doubter to a believer of climate change?
- Why the radar station at Tai Mo Shan needs to be manned during typhoons?
- Where algebra originates?
- Observatory staff may have been the first prisoners captured by the Japanese army in Hong Kong during World War II?
- Sugar produced more than 1,000 years ago was darkish in colour?
- What a weather chart can tell you about the vagaries of politics?
- Which kind of severe weather has claimed more casualties : typhoons, rainstorms, lightning or very hot weather?
- Why, in forecasting typhoons, humans get it right sometimes while at other times computers can be so accurate they can predict a 90-degree course change days ahead?

Find out from the Director's Blog.

台長網誌  
Director's Blog

台長網誌  
Director's Blog



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台長網誌  
*Director's Blog*





# 前言

互聯網的出現，徹底改變了整個世界。它不僅大大加快了信息的傳遞，更拉近了人與人之間的距離。香港天文台一九九六年設立的互聯網站，至今天已成為天文台發放天氣信息的主要渠道，每年瀏覽頁次超過十五億。

互聯網亦促進了市民對天文台工作的討論，從日常的氣象服務，到颱風暴雨等惡劣天氣警告，無不觸及。作為負責任的政府部門，我們有必要對主流民意作出回應，並向市民傳遞正確天氣信息。

此外，一些議題影響深遠，例如氣候變化、天氣與健康、自然災害的影響等。我們有責任提高市民對這些議題的關注和認識。

前任台長林超英先生去年開始在天文台網頁撰寫網誌，就是要利用這個深受市民歡迎的平台，以較輕鬆的方式與民溝通，或講解氣象，或回應民情，或藉身邊事物分享人生體驗。推出以來，廣為市民瀏覽。我自年初接任台長後，延續了這個習慣。今次結集成書，希望讓喜歡「台長網誌」的市民保存留念，也可讓一些不太習慣上網的讀者分享我們的想法。

香港天文台台長  
李本澄  
二零零九年十一月

## 台長網誌 Director's Blog

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## Preface

The advent of the internet totally changed the world. It has greatly facilitated the spread of information and brought people closer than ever. The Hong Kong Observatory website set up in 1996 has become a major channel for providing weather information to the public, and is now attracting more than 1.5 billion page visits a year.

The internet has also fostered public discussions on the work of the Observatory, from the day-to-day meteorological service to severe weather warnings such as those on typhoons and rainstorms. Being a responsible government department, we deem it necessary to respond to the mainstream views and propagate the correct weather information to the public.

We also have the responsibility to promote public awareness of such far-reaching issues as climate change, weather and health, and impacts of natural hazards.

For these, Mr Lam Chiu-ying, former Director, started preparing blogs on the Observatory website last year. The aim is to use this popular channel to communicate with the public in a more light-hearted manner – to explain meteorology, respond to public opinions, or simply share personal thoughts and feelings. It has been well received. I endeavoured to continue this tradition since taking over the directorship early this year. Apart from those who like reading the Director's Blog, this collection of blogs is also meant to share our thoughts with those who do not visit the internet often.

**Lee Boon-ying**  
**Director of the Hong Kong Observatory**  
**November 2009**



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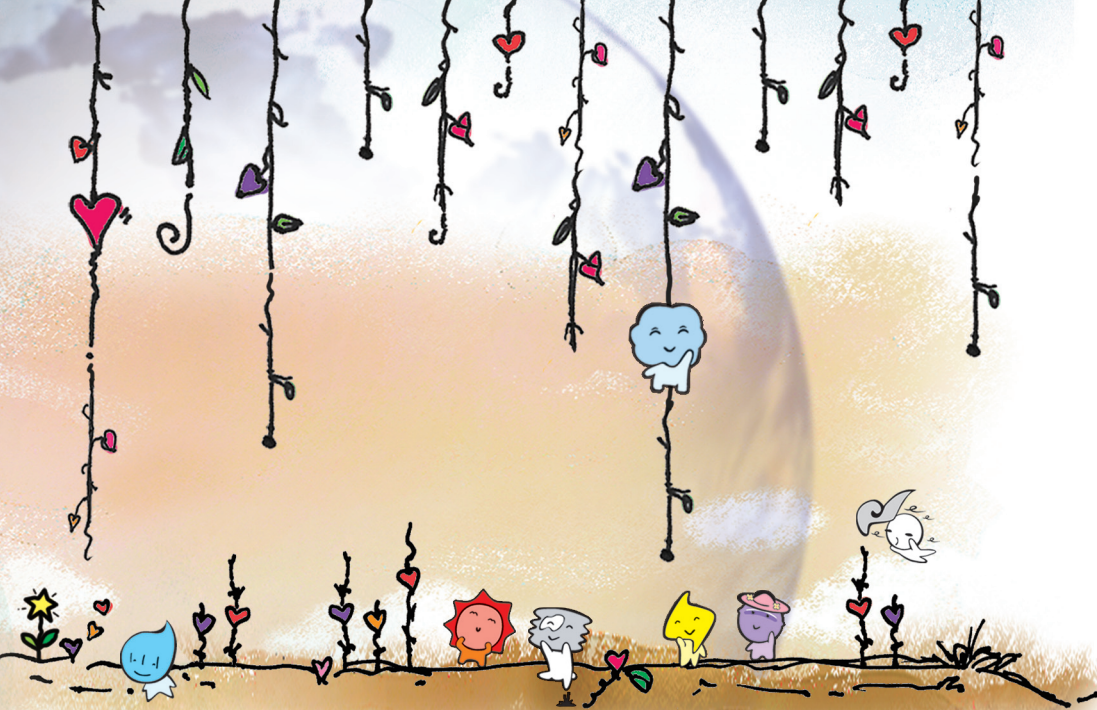
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## 五·一二地震

### The 12 May Earthquake

5月12日四川的7.8級地震威力強大，遠至1450公里外的香港亦感震動，是香港有感地震自有紀錄以來相關震中最遠的紀錄。

The powerful earthquake in Sichuan on 12 May was felt in Hong Kong, some 1450 kilometres away. According to our records, no previous earthquakes felt in Hong Kong had an epicentre more distant than this one.

過去兩三天，餘震陸續發生，震中的位置有向東北方向擴散的情況。第一次大震的震中靠近都江堰市與卧龍，現在餘震的震中已經去到四川和甘肅交界一帶。具體情況大家可以參閱天文台不斷更新的地震新聞公佈及專題網頁（[http://www.hko.gov.hk/gts/quake/equake\\_sichuan\\_c.htm](http://www.hko.gov.hk/gts/quake/equake_sichuan_c.htm)）。

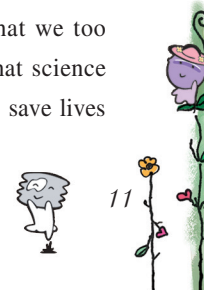
災後救援十分重視氣象預報，大地震下午2時28分發生，國家氣象局下午3時正已經發出了災區的氣象服務專報，這樣迅速為救災提供需要的天氣信息，反映了對人民福祉的關注、高效率的專業運作，以及事前的早有準備。

天文台的同事對內地同行表示高度敬意，並警惕我們自己要在工作中為種種災害早作籌謀，讓科學在重要時刻發揮救人的作用。這是我們全台同事不斷努力的目標。

The epicentre of the initial great shock was located near Dujiangyan City and Wolong. In the last couple of days, aftershocks continued and their epicentres tended to be located to the north-east of this initial location. Some of them were getting close to the border between Sichuan and Gansu. The details are given in the latest press releases issued by the Hong Kong Observatory as well as the dedicated webpage ([http://www.hko.gov.hk/gts/quake/equake\\_sichuan\\_e.htm](http://www.hko.gov.hk/gts/quake/equake_sichuan_e.htm)).

Weather forecasts are very important to the rescue operation. The earthquake took place at 2:28 p.m. The China Meteorological Administration issued its first special meteorological bulletin for the disaster area at 3:00 p.m. This was an incredibly fast response, which reflected how much weather forecasters cared about the people, how effective their professional operation was and how well-prepared they were.

Hong Kong Observatory colleagues send our salutes to our meteorological counterparts in the mainland. At the same time, we remind ourselves that we too have to plan well ahead so that science could be applied effectively to save lives





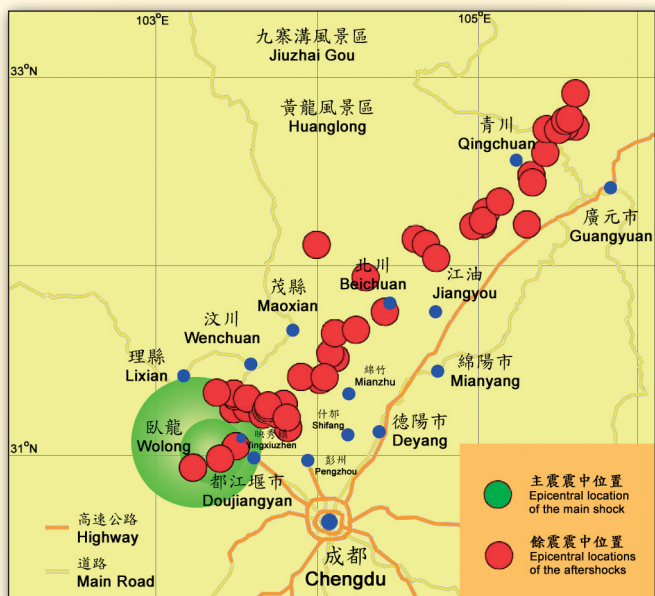
謹此誠心悼念地震中的亡者，並願望受災者早日得到救援，以及盡快回復正常的生活。

林超英  
2008年5月15日

in the face of natural hazards. This is what motivates us at the Observatory to work hard all the time.

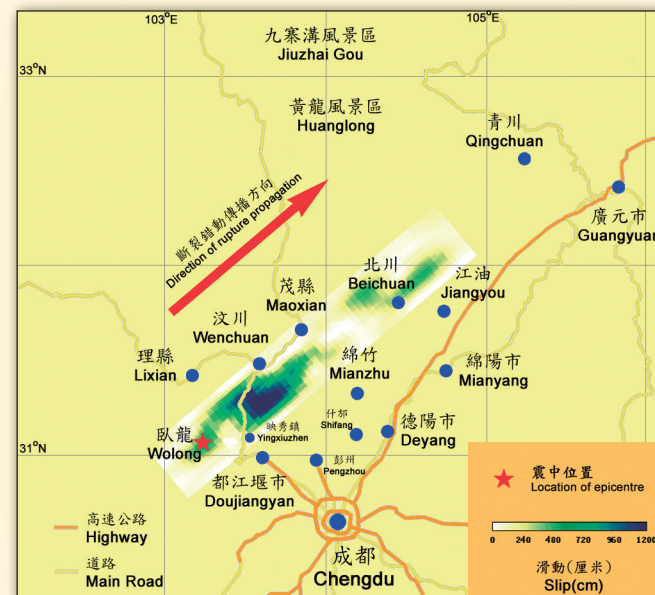
We feel very sorry for those who lost their lives. We sincerely hope that rescue would reach those in need soon and that life would resume normal before long.

C Y Lam  
15 May 2008



圖一：5.12大地震及餘震震中位置示意圖（5.0級或以上）

Figure 1: Illustrative diagram of the epicentral locations of the 12 May earthquake and aftershocks (MAGNITUDE 5.0 OR ABOVE)



圖二：5.12大地震地殼滑動分佈示意圖（數據來源：中國地震局）  
Figure 2: Illustrative diagram of crustal slips of the 12 May earthquake  
(Data Source: China Earthquake Administration)





# 走出哀傷，珍惜生命

## *Leaving sadness behind*

5月19日至21日是全國哀悼四川大地震亡者的日子。今天我們走出哀傷，願望大家重新振奮，面向未來。

生命本質帶著「生」與「死」兩個方面，大地震提醒我們「死」的必然，也因此我

From 19 May to 21 May, the country mourned the great loss of lives in the Sichuan earthquake. Today let us leave the sadness behind and resume working hard for the future.

Life by its nature includes both “living” and “dying”. The earthquake reminds us that dying is inevitable and

們更要珍惜難得的「生」。在平常的每一天，都要用心活著，多些關心身邊的人們，並做好自己的工作，為世界作出貢獻。

19日我們全體同事在總部草地一起為大地震亡者默哀，在一片寂靜中，一隻喜鵲出現在我們的眼前，在樹上跳躍，逐步上升，最後回到旁邊高架天線桅杆上的巢，我覺得牠在暗示生命的生生不息，以及鼓勵我們好好地活下去。

其實天文台內有一片小樹林，有講不完的生命故事。

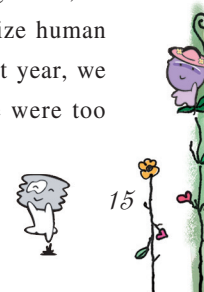
今年樹林裏一對麻鷹築了一個大巢，育了一隻小麻鷹，目前羽翼漸豐，正在學習拍翼，但是仍然未能飛翔。山林道一位熱心市民送來牠的近照，謹奉上跟大家分享。我們在此多謝該位市民提供有關消息，讓我們有機會採取措施減少人為騷擾，避免了重複去年因為人為騷擾過度造成的棄巢

therefore that we should appreciate the great value of being alive. Everyday, we should be grateful for being alive, care about people around us and do our jobs properly so as to contribute to the collective welfare of the world.

On the 19th, Observatory staff stood in silence in honour of the dead in the earthquake. In the silence, a Magpie appeared on the lawn, worked its way up the branches, eventually reaching its nest high up on the mast for aerals. To me, it was reminding us of the never-ending story of Life and encouraging us to live our own lives fully.

Indeed in the small wood within the Observatory ground, there are endless stories to be told about the working of Life.

A pair of Black-eared Kites built a nest this year and successfully raised a chick. It is starting to exercise its wings but is as yet unable to fly. A resident of Hillwood Road recently sent me a couple of photographs; I am happy to share one with you. I would like to thank her for alerting us about the breeding effort, so that we were able to minimize human disturbance to the birds. Last year, we were not aware of it. There were too







圖一：相片由黃瑞芝女士提供  
Figure 1 : Photograph Courtesy of Ms Wong Shui-chi



圖二  
Figure 2

慘劇。生命真的需要小心呵護。

此外，天文台的樹林今年開花特別燦爛，相信跟年初有幾乎一個月長的寒冷期有關。冬天有真正冬天的感覺，春天也就回到原來春天的樣子。目前林中的鳳凰木紅花盛放，遠看一片花海，十分壯觀。鳳凰木英文名字是 Flame of the Forest 「樹林中的火焰」，實在名不虛傳。我們上周拍了一張鳥瞰圖，也跟大家分享。

much disturbance such that the eggs were abandoned, which was a great pity. Life is indeed very fragile and needs a lot of care.

Furthermore, the flowering trees in the wood at the Observatory are very impressive this year, most probably because of the prolonged cold spell earlier this year. Since winter felt truly like winter, spring does look like spring in the old days, with beautiful blossoms everywhere. The Flame of the Forest Tree is now in full blossom and the red mantle fully explains why the tree is so named. A bird's eye view photograph is attached, to show the wonderful view.

每年的風雨都會為樹林和雀鳥帶來一些傷害，但又往往同時帶來潤澤生命的機會。自然從來都是兩面的。

不要讓一刻的挫折使我們祇看到自然的負面。願望大家感受自然界多種多樣的生命體欣欣向榮的喜悅，並讓自己活得開心。

祝願四川大地震亡者安息，生者堅強地活下去。

Every year, typhoons and rainstorms cause some degree of damage to birds and trees. But they also bring the rain-water which is so essential to Life. Nature is always both positive and negative.

I hope that we would not let one single disaster lead us to see only the negative. We must remind ourselves of the joy of having a great diversity of life-forms on Earth. Being alive is happiness itself.

May the dead in the Sichuan earthquake lie in peace and the living stand tall in embracing the future.

林超英

2008年5月22日

C Y Lam  
22 May 2008





# 生命・自然・地震

## Life - Nature - Earthquake

5月24日，天文台樹林裏的小麻鷹首次振翅高飛，離開了過去兩個月的家，在父母的視野內，短距離飛行，認識周圍的環境。這幾天牠還間中回到牠熟悉的巢，不過，大概再不用多久，牠將翱翔

On 24 May, the young Black-eared Kite in the Observatory's wood flew off from the nest for the first time. Under the watchful eyes of its parents, it flew short flights checking the nearby neighbourhood. In the last few days, it still returned to the nest from time to time. But I am sure that very soon it would soar high and go to faraway places, becoming

天際，去到遙遠的地方，到處為家，成為地球生命延續的一環。

生命就像一條長河，川流不息。無數河流的傾注，融合而成大海，大海不斷蒸發的水汽，輾轉通過風雲雨雪回歸大地，滋養著河川。河口見證的是河的「死」、海的「生」。下雨是雲的「死」，卻是河的「生」。生死往復，分不清哪裏是起點，哪裏是終點。

五一二大地震把我們的注意力拉到自然界「死」的一方，但是我們必須平衡自己的心態，避免過度哀傷。大地震後受災人民的堅強、救援人員的努力、世界各地包括香港人的慷慨捐輸，處處都顯出人類求生的強烈本能，以及互相支持的仁愛本質，很好地表現了自然界「生」的一面。願望大家守持著人性關懷，以後更多地貫徹在日常生活之中。

part of the everlasting Life on Earth.

Life is like an ever-flowing river. Numerous rivers join hands to form the wide oceans. Sea-water evaporates to become water vapour, eventually turning into cloud, rain or snow, and then returning to the ground and nourishing the rivers. At river estuaries, rivers "die" while the oceans are "born". On the other hand, rain marks the "death" of clouds but also the "birth" of rivers. In the great cycle of life and death, there is no way to tell where the start and the end are.

The 12 May drew our attention to the "death" aspect of Nature. But we must carefully maintain a balanced mind, avoiding being overloaded with sadness. After the earthquake, we saw the survivors showing great dignity, the rescuers working hard to save lives, and people all over the world including Hong Kong donating generously. It is clear that the human race is born determined to live and ready to help one another. This is a good reflection of the other aspect of Nature, that of "life". I hope that we all carefully preserve our caring attitude towards fellow human beings and let it prevail in our daily life.







談到地震，我想談一下地殼板塊碰撞。四川大地震的根本原因是印度板塊遇上歐亞板塊，在碰撞中累積能量，超過某個極限時透過地震釋出能量，轉化成地殼表層的震動，碰上人口密集的城鎮，房屋倒塌造成大量傷亡。從這個角度看，地殼板塊碰撞是「惡」。

但是正因為板塊碰撞，形成了青藏高原和喜馬拉雅山脈，自印度洋北上的濕暖氣流遇到障礙，向東轉移來到中國，成為我們夏季的西南季候風。季候風帶來水汽，華南才得以脫離成為沙漠的厄運（我們的緯度跟阿拉伯沙漠和撒哈拉沙漠一樣），黃河、長江流域才有雨水潤澤農業文明，孕育中華民族成長。從這個意義來說，板塊碰撞也有「善」的一面。

自然總是生機與殺機並存的，不能單以人的角度去衡量

On the subject of earthquake, I would like to talk about tectonic plates. The fundamental cause of the Sichuan earthquake was the collision between the Indian Plate and the Eurasian Plate. When energy accumulates beyond certain threshold values, earthquakes occur and the energy is released to become tremors on the Earth's surface. Where the tremors hit population centres, many get killed or hurt in collapsed houses. In this sense, the collision of tectonic plates is "evil".

But the same collision was responsible for the uplifting of the Tibetan Plateau and the formation of the Himalayan mountain range. When warm moist air from the Indian Ocean goes north and runs into this blockage, it turns eastward to become the south-west monsoon in summer. The monsoon brings water vapour to southern China, which therefore escapes the fate of becoming a desert (our latitude is the same as deserts in Arabia and the Sahara). For the same reason, the Chang Jiang (Yangtze River) and Huang He (Yellow River) watersheds have been blessed with sufficient rain to support agriculture and civilization, and thus the growth of the Chinese race. From this perspective, the collision of the tectonic plates is a "benevolent" event.

所謂善與惡。人既然來到世上，就要胸懷慈愛跟眾多生物共享自然的生機，並以尊敬的態度去面對自然的殺機，即是以科學去認識自然的規律，並藉此趨利避害。

舉地震為例，由於我們未能定時定點預測地震的發生，餘下的防災辦法有二：其一是根據地震歷史資料和近代儀器觀測數據，建造配合各地情況的抗震建築物。其二是不讓人住到地震頻繁之處。兩者的共通點就是順應自然規律。活在自然之中，也許這是唯一的選擇。

林超英

2008年5月30日

Nature is always at the same time the source of life and the cause of death. There is indeed no point in labelling it as benevolent or evil from only the point of view of human beings. As a part of Nature, we should gladly share this unique opportunity of being alive with the diverse species on Earth. We should also respectfully recognize the capability of Nature to kill, which would require us to understand the laws of Nature through science and then take actions to stay out of harm's way.

Taking earthquakes as an example, since we cannot predict exactly when and where earthquakes will occur, we are left with two options. One is to build houses strong enough to stand earthquakes indicated by historical records and the data from modern monitoring equipment. The other is to stop people settling in earthquake-prone areas. The common theme between the two approaches is that we act in a way recognizing the forces of Nature. To live as part of Nature, there is perhaps no other better way.



C Y Lam  
30 May 2008









當時我就像其他氣象發燒友在網上所說一樣，對於雷達顯示雨區不斷向香港匯聚集中（見附圖二），感到大惑不解，就算事後再檢視天氣圖，箇中道理仍然不容易明白。事實上，由於氣象觀測始終未能全面覆蓋整個立體空間，對「現在」的天氣形勢其實我們並非完全掌握，因此「未來」的風雲雨霧便有不可測之處。

雖然現代科技比以前進步，在複雜無比的大自然面前，我們還是不得不謙卑恭敬，誠心接受「天道運行，自有軌跡」。

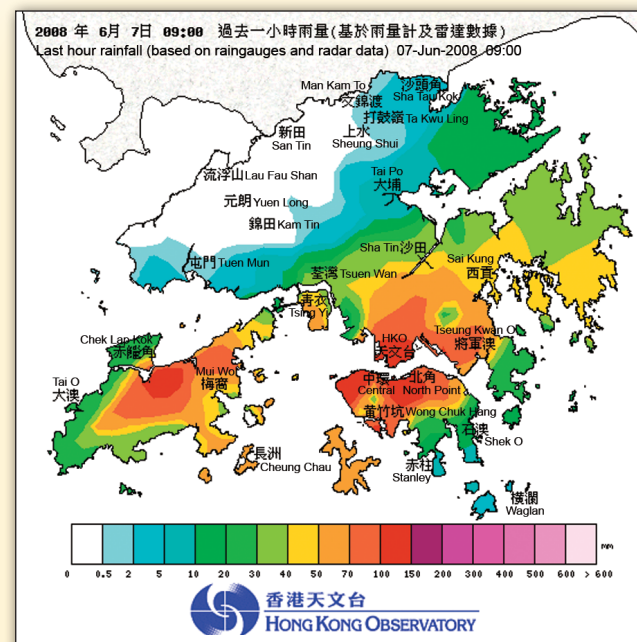
林超英  
2008年6月23日

Hong Kong is small. But due to the hilly terrain, rain could be highly variable within the territory itself.

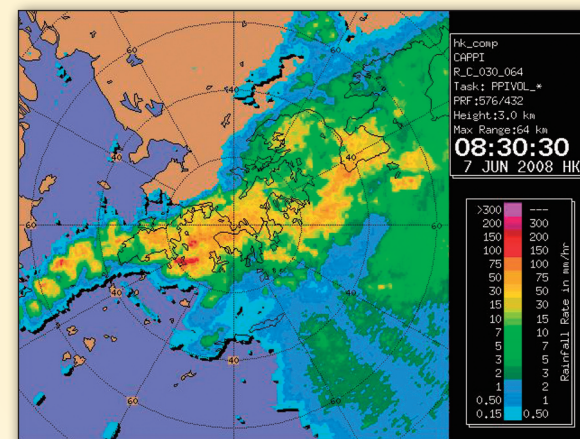
At that time, like weather fans who discussed the subject on the internet, I was puzzled to see the radar scope showing rain areas which kept on converging on Hong Kong (see attached figure 2). Even after I studied the weather charts later, it was still not easy to understand. In fact, modern meteorological observations still do not cover the 3-dimensional atmosphere fully. In the absence of a complete knowledge of "the present" in terms of the weather situation, it is inevitable that the weather in "the future" is not completely predictable.

Although modern technology is more advanced than before, we must remain humble in the face of the great complexity of nature. We have to respectfully recognize that the great natural forces do determine their own course.

C Y Lam  
23 June 2008



圖一：8時至9時雨量分佈  
Figure 1 : Rainfall distribution 8-9 a.m.



圖二：8時30分雷達圖像  
Figure 2 : Radar picture 8:30 a.m.



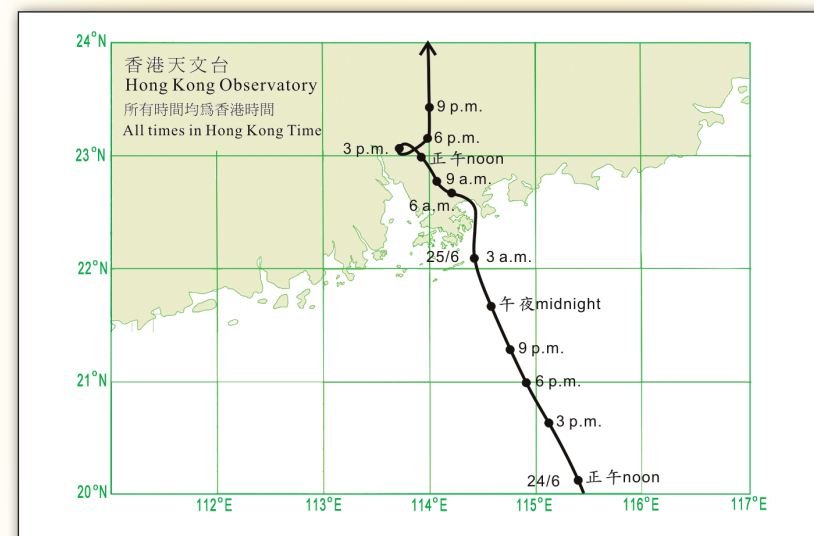
# 颱風「風神」 Typhoon Fengshen

颱風「風神」為香港帶來今年的第一個8號風球，6月25日上午更為市民帶來半天意料之外的假期。

今次「風神」襲港，來勢洶洶，不過我們很幸運，幾個因素疊加起來，把颱風

Typhoon Fengshen brought the first number 8 signal this year. It also gave people an unexpected half-day holiday in the morning of 25 June.

Fengshen had a very dangerous look as it approached Hong Kong. But we were lucky. Several factors worked together to reduce its impact on Hong Kong to a very low level. Firstly, as the



圖一：風神接近香港時的路徑圖  
Figure 1: A close-up map of the track of Fengshen near Hong Kong

對香港的影響減到極低。首先是颱風在南海北移途中減弱為一個強烈熱帶風暴，其次是「風神」在幾乎登陸香港之前兩三小時，忽然向右拐了一個彎，在西貢郊野公園以東海面掠過（圖一），香港免了正面襲擊的厄運，第三是「風神」最接近香港時，境內主要吹偏北風，山形屏障令大多數地區風力不算太大，最重要的一環

typhoon moved northwards across the South China Sea, it weakened into a severe tropical storm. Secondly, a couple of hours before it was about to land in Hong Kong, it swerved to the right and narrowly missed Hong Kong, traversing the waters offshore Sai Kung Country Park (figure 1). Thus we were spared a direct hit. Thirdly, at its closest point of approach, Fengshen brought generally northerly winds in Hong Kong. Most places were therefore sheltered by the hills. Finally and most importantly, when



是：「風神」逼近時，大部份人已經下了班，大家都留在安全的家裏，避開了在路上面對風雨的險情。

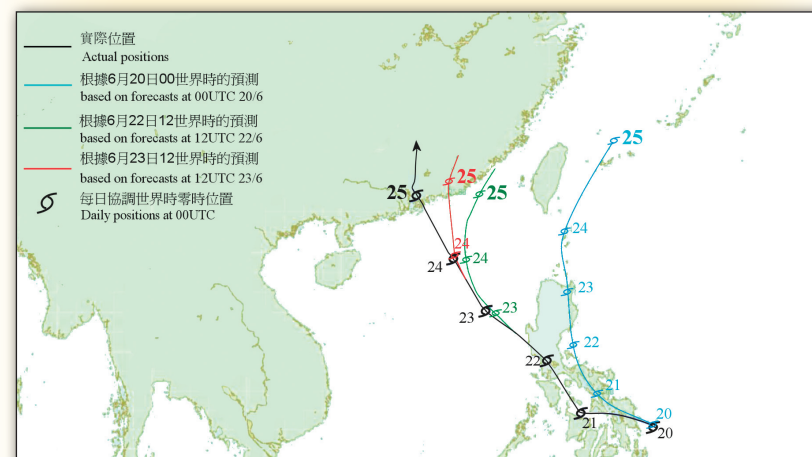
如果「風神」提早數小時到達，恐怕大家要捱下午逼車回家和次日上午在風雨中狼狽上班之苦，而天文台又要捱來自四面八方的痛罵，局面會是天淵之別。風是一樣的風，雨是一樣的雨，前後幾小時後果迥異，究其原因就在人的一方。這是前線氣象人員在工作中必須面對的現實。

讓我們談談科學。颱風「風神」的移動途徑事後來看不算複雜，連續數天大致向西北方移動（圖二），表面並無甚麼異像，但是當時我們（包括世界各地的同行）在高空天氣圖見到它的移動前方是一個高壓中心，直走是不合常理的，連全世界最先進的幾個數值預報模式都有

Fengshen got close, most people had already left work and were back in the safety of home. There was no need to commute in wind and rain.

Had Fengshen arrived a few hours earlier, I am afraid people would have to face traffic jam in the homeward rush and to go back to work the next morning in unpleasant wind and rain. In that case, the Observatory would be the target of complaints and outright scolding. It would have been a totally different situation. The wind and the rain would be the same, but a difference of a few hours would have resulted in very different outcomes. The reason of course is the human perception. This is the reality which front-line meteorological workers have to live with.

Let us have a look at the science. After the event, the track of Typhoon Fengshen looked rather simple and normal, plodding steadily north-westwards over a period of several days (figure 2). But we at the Observatory (and our counterparts elsewhere in the world) saw in the upper-air weather charts that it was heading into an area of high pressure. Going straight ahead would indeed violate established wisdom. Even the world's most advanced numerical models shared the same



圖二：融合多個數值預報模式的颱風風神合成預報路徑

Figure 2: Ensemble Forecast Tracks of Typhoon Fengshen using Multiple Numerical Prediction Models

同感，連續多天計算的預報途徑都是向北再轉向東北，早期預報在菲律賓以東海面北折，跨過菲律賓進入南海後預測移向台灣海峽，抵達香港前不久還是預測轉向襲擊廣東東部（見圖二）。

從這個角度看，今次的颱風移動途徑有點詭異，不懂電腦、不識氣象的人可能比有電腦輔助的科學家預測得更好，顯然，人類的所謂「高科技」

sentiment. For consecutive days, the models together predicted Fengshen would turn northward and then north-eastward. At first, it was forecast to turn northeast of the Philippines. After crossing the Philippines and entering the South China Sea, it was forecast to move towards Taiwan Strait. Even shortly before reaching Hong Kong, it was forecast to turn and hit eastern Guangdong (see figure 2).

Seen from this perspective, the peculiar thing about the typhoon track is that people who know nothing about computer and meteorology could have predicted it better than scientists aided by





也有不靈光的時候。真正高科技其實在大自然之中。

或者有人把話反過來說，指氣象人員加上電腦全無用處，預測能力比一個普通人還差，後者把颱風中心一路向前推便可贏了這場比賽。我必須指出，這是把一個特例說成一個通則。事實上，自從有電腦模式之後，預測颱風移動途徑有了長足的進步，情況在進入2000年代之後更為顯著（見圖三）。當然，科學家不能自

computer. What we call “high technology” does fail occasionally. The real high technology actually resides in Nature itself.

Some people might turn it around and say that meteorologists and computers are useless. The man in the street who simply pushes the typhoon centre ahead would have won the competition. I have to point out that this is using a single case to create a “general principle”, which is not a good practice. Since computer models became part of the trade, typhoon track forecasting has improved a lot. It is particularly noticeable since 2000 (see figure 3). Of course, there is no room for complacency for scientists. The failure this time marks

滿，今次的失敗是新一輪研究的起點。

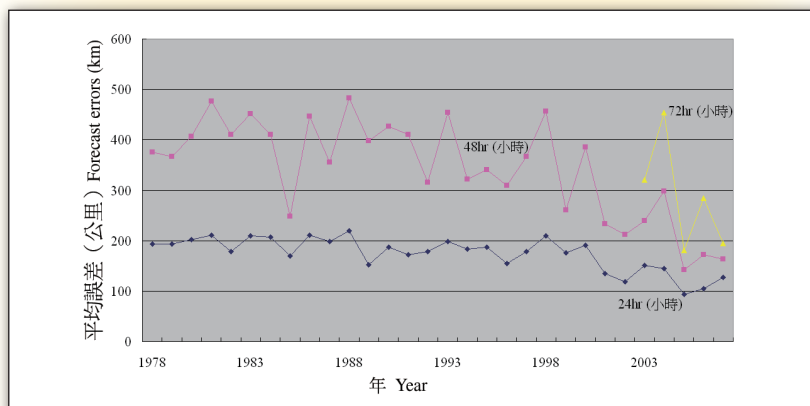
在為公眾服務的事情上面，我們的工作必須放在一個理性的基礎上，以電腦模式的計算結果去指導預報工作就是這個思路的體現，亦是尋求持續進步的唯一辦法。提高天氣預測水平，捨此別無他途。

林超英  
2008年6月30日

the beginning of a new round of research efforts.

In serving the public, our work has to sit on a rational base. Providing guidance to forecasters through the use of the computation outputs of computer models is a realization of this principle. It is also the only means of enabling continual improvement. To be able to forecast weather better in the future, there is no other way.

C Y Lam  
30 June 2008



圖三：香港天文台熱帶氣旋預測位置平均誤差  
Figure 3 : Mean errors of Hong Kong Observatory's tropical cyclone position forecasts







## 知識帶來煩惱

*Knowledge brings worry*

7月7日整天斷斷續續下著雨，對大多數人來說，是一個很普通的下雨天，但是對前線的預報員，卻是一個特殊和十分煩惱的日子。

Rain fell intermittently on 7 July. To most people, it was just another rainy day. But to front-line weather forecasters, it was a very special, worrisome day.

我們原本構想在南海的廣闊低壓槽會逐漸靠近香港，並帶來連綿的大雨，7月6日香港亦確實下了頗大的雨。但是一個低壓區同日靜悄悄地在海南島東面的海面形成，而且向東北移動，為天氣預測帶來難料的變數。

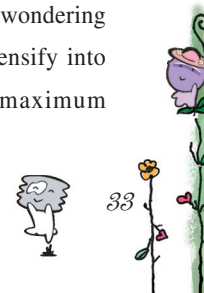
雖然種種證據顯示這個低壓區不會加強，但是畢竟天氣圖上清楚出現了一個旋渦，逐漸靠近香港，預報員不敢怠慢，開始在向公眾發出的天氣報告中的「天氣概況」欄提到這個低氣壓區。

7月7日天文台外弛內張，預報員緊盯著闖入200公里範圍的低壓區，台長則時刻牽掛著系統會否加強為一個中心最高持續風力超過40公里/小時的熱帶低氣壓，並可能因此需要發出一號風球。在這種近距離「搏鬥」中，電腦計算的數值

We had expected the broad trough of low pressure in the South China Sea to edge close to Hong Kong, bringing continuous heavy rain. Indeed rain fell hard on 6 July. But an area of low pressure quietly emerged over the sea to the east of Hainan Island. It started moving towards the north-east, adding an element of unpredictability in the weather forecast.

While all evidence indicated that the area of low pressure would not strengthen too much, it did show up clearly as a vortex in the weather map and was moving closer to Hong Kong. The weather forecaster appreciated that it was something requiring attention and started mentioning it in the "General Situation" section of the weather bulletin for the public.

It was business as usual on 7 July, but tension gradually built up. The forecaster kept the area of low pressure under close watch as it crossed the 200 km circle. The Director could not resist wondering whether the system might intensify into a tropical depression with maximum





模式屬於遠水救不了近火，唯一的辦法就是緊密監視，隨機應變。

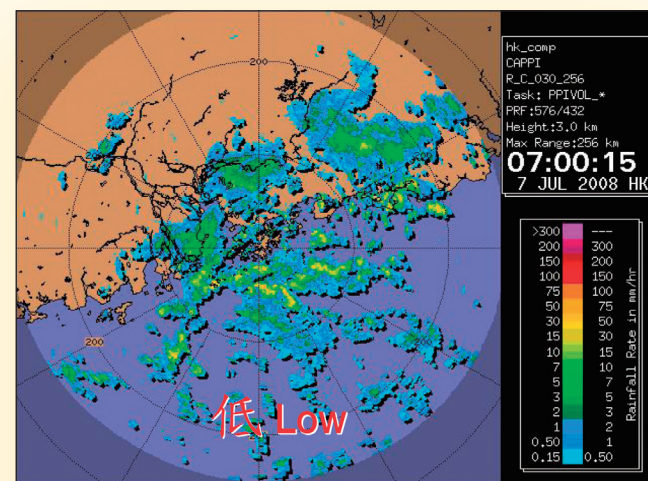
隨著低壓區在南方掠過，香港轉吹偏北風，天氣形勢稍為穩定，雨勢減小，甚至停了一段時間，傍晚時份，這個幾乎成為熱帶低氣壓的旋渦在香港以東不遠的汕尾、惠州一帶登陸，為該處帶來大雨。香港方面，晚上轉吹西南風時重新下了一些雨，不過整天下來，記錄得的雨量就比前一天少了一截。

這個在廣闊低壓槽內生成的低氣壓旋渦在海上資料貧乏處生成，帶有很大程度的不可測性，祇要低壓區的風力加強少許，一號風球便要發出，祇要低壓區登陸地點西移100公里左右，香港的風和雨便會大得多。上天的少許偏差，往往化為一個地點天氣的重大分別，

sustained winds near the centre exceeding 40 km/hour. Should it happen, a number 1 signal would be required. With a weather system in such close proximity, computer outputs from numerical models were of little use. We were left with watching it closely and responding as the situation evolved.

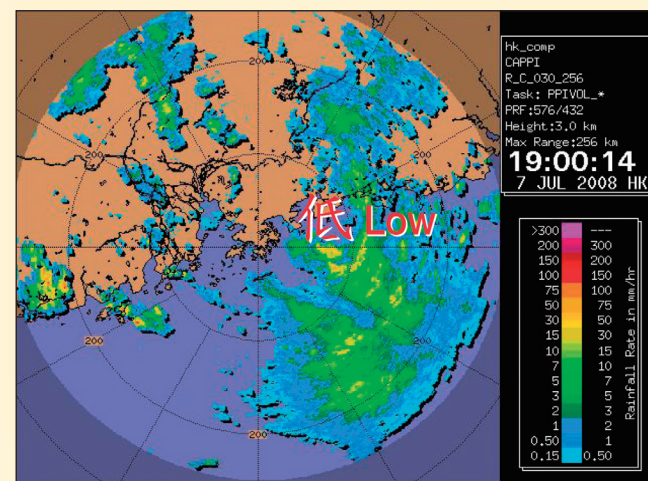
As the area of low pressure skirted to the south of Hong Kong, local winds turned northerly. Weather stabilized and rain subsided. It even stopped for a while. By the evening, the vortex, which was very nearly a tropical cyclone, landed to the east of Hong Kong in the nearby Huizhou-Shanwei area where much rain fell. In Hong Kong, winds turned south-westerly and rain resumed. But the rainfall amount on 7 July was noticeably less than that on the previous day.

The area of low pressure and the associated vortex developed in a data-scarce area in the sea. There was a high degree of unpredictability. Had it intensified just a little more, it would have necessitated the issuance of the number 1 signal. Had it landed 100 km to the west, Hong Kong would have experienced



圖一：低壓區闖入香港200公里範圍（上午7時雷達圖像）

Figure 1 : An area of low pressure came within 200 kilometres of Hong Kong (radar picture around 7a.m.)



圖二：低壓區在香港以東登陸（下午7時雷達圖像）

Figure 2 : An area of low pressure made landfall to the east of Hong Kong (radar picture around 7p.m.)





這就是預報員在日常工作中不斷碰到的情況，也就是天氣預測艱難之處。

7月7日大多數香港人過著尋常的日子，但是掌握大量氣象信息的氣象人員卻為低氣壓旋渦擔憂了一整天。

大家常說：知識就是力量。我要告訴告訴大家：知識有時是煩惱的來源！

林超英

2008年7月9日

much more wind and rain. A tiny shift in the atmosphere very often translates into major differences in weather at a particular spot. This is what the weather forecaster has to live with nearly every day in his work. This is what makes weather forecasting difficult.

To most people in Hong Kong, 7 July was just another day. But for the weathermen who looked at the large volume of weather information, it was a day of great worries because of the low-pressure vortex.

Many people say : knowledge is power. Let me tell you : knowledge sometimes is the source of worry!

C Y Lam

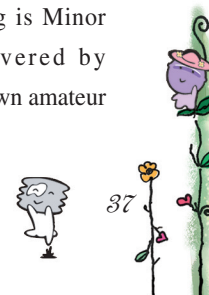
9 July 2008



## 小行星64288號 Minor Planet 64288

朋友告訴我，天上有顆「林超英星」，我覺得很意外，剛過去的周末我在國際天文聯會的網站真的找到了有關信息。「林超英星」是64288號小行星，由著名的香港業餘天文學家楊光宇先生於2001年

I was rather surprised when a friend told me that there was a “star” bearing my name Lamchiuying. Last weekend, I checked the website of the International Astronomical Union and indeed found a record there. Lamchiuying is Minor Planet No. 64288, discovered by Mr W.K.Y. Yeung, a well-known amateur





10月18日發現，並蒙他的錯愛冠上我的名字，謹向他致謝。

在國際天文聯會的命名通告中，提到我是香港天文台台長和香港觀鳥會前主席，以及我在氣候變化方面的推廣工作。最後一項，是我目前最牽掛的事。

直到2001年，我仍然不相信人類可以影響氣候，總覺得氣候變化自古以來都時有發生，何必大驚小怪。但是政府間氣候變化專門委員會在2001年發表了一份報告書，融合全球科學家的研究結果，以大量數據確認了近二百年來的氣候變化，又以強而有力的論證確立了人類燃燒煤和石油等放出二氧化碳引致全球變暖的因果關係。我是科學家，在證據面前認識到人類必須為全球氣候變化負責，以及了解到失控的氣候變化可以帶來嚴重後果。

astronomer of Hong Kong, on 18 October 2001. I would like to thank him for kindly assigning my name to this astronomical object.

In the IAU citation regarding the formal naming, it mentions my positions as Director of the Hong Kong Observatory and ex-chairman of the Hong Kong Bird Watching Society, as well as my effort in promoting public awareness of global warming. The last item is what occupies my mind most of the time nowadays.

Up to 2001, I still didn't believe that human beings could change climate. To me, climate had always been changing and there was no particular need to worry about occasional fluctuations. However, the Inter-governmental Panel on Climate Change published an assessment report in 2001 based on the amalgamation of the research results of scientists all over the world. Data confirmed the significant climate change in the last 200 years. A strong case was presented establishing the causal relationship between carbon dioxide emitted by human beings burning coal and petroleum and the observed global warming. I am a scientist. Seeing the solid evidence, I appreciate that

從那時開始，我努力把我所知告訴大家，希望促進民眾對氣候變化的認識，以及讓大家知道必須做些甚麼去減緩變化的速度，以免人類及眾多生物走上滅絕之路。

為了氣候的未來我到處演講，又組織天文台的同事深入研究香港本身的情況，並向全港廣而告之。我祇是盡了有良心的科學家的一份責任，沒有名利的追求，但是在推廣氣候變化的過程中，間中碰上被人揶揄為「一味靠嚇」（廣東話口語），難免有片刻遲疑，還要幹下去嗎？

小行星64288號的出現，讓我知道世上尚有同道中人，因此我不會氣餒。為了防止危害眾生的氣候變化出現，我會繼續努力。

小行星64288號掛上了我的名字之後其實甚麼變化都沒有，依然在它自己的軌跡上行

human beings are responsible for climate change and further realize that uncontrolled climate change would have serious consequences.

From then onwards, I try my best to tell people what I know about. I hope that people would know better what climate change is. I tell people what we must do to reduce the rate of climate change, so as to avoid getting human beings and numerous other living species onto the road to extinction.

Hoping for a viable climate in the future, I gave talks everywhere. I asked colleagues of the Observatory to study how Hong Kong climate would change and then publicize the results for people's information. However, as I worked to promote public awareness of climate change, from time to time, I was labelled an "alarmist". At those moments, I do wonder whether I should continue my effort.

The arrival of Minor Planet 64288 is a timely reminder to me that other people on Earth do share my concern. Thus I am not going to give up my campaign. I shall persevere in my effort to prevent climate from becoming hazardous to living things on Earth.







走，不過心中冥想自己在它的位置，在黑暗中默默觀察宇宙的動靜，尤其是遠處藍色的小小地球，別有一番體會。人類的出現和滅絕，說到底祇是微光一瞬間。

林超英  
2008年7月16日

Minor Planet 64288, with or without my name, remains its own self moving on its original orbit. However, for me, I could now imagine myself at its position watching silently in darkness the evolving universe and in particular the tiny blue Earth in the distance. It offers a total perspective. The emergence and extinction of the human race would be but a faint, miniscule flash.

C Y Lam  
16 July 2008



昨天出席了在歷史博物館舉行的「風雨人間125年」展覽開幕典禮。展覽為期兩個月，9月22日是最後一天。

在出門前往會場前，重感冒令我臥牀三夜三日，險些無法參加這個香港天文台成立125

I attended the opening ceremony of the exhibition "Weathering the Storms for 125 years" at the History Museum yesterday. The exhibition will last for two months, up to 22 September.

Severe flu had kept me in bed for three nights and three days before I left for the ceremony. I nearly missed





周年的重要約會。這次病倒讓我想到一個問題：個人的壽數有限，為甚麼由人組成的機構如天文台卻可以延續125年甚至更長？唸科學的人往往會問其他人覺得毫無問題的問題。

我想一個機構大概就像一個生命體，有它自己的存活目標。在這個目標的引領下，一代又一代的員工，年輕時進來，年長時出去，燃燒青春為機構提供能量，讓機構向著目標進發，因此機構的歲數就跳出了人類壽數的限制。小我有限，大我無限，關鍵在於小我「敬業樂業」，把能量匯聚到大我的目標裏。這個我稱為機構生命體目標的東西，相當於近年管理學常提到的「願景」或「理想」，是機構生命力的核心。

機構的延續不絕，還需要有集體記憶，不斷累積經驗和能力，具體表現在機構的典章

this important occasion marking the 125th anniversary of the Hong Kong Observatory. While I was struck down by flu, I thought of the question: why organizations like the Observatory could last 125 years or even longer when its constituent members all have finite life? Students of science like me are people who ask questions where others see no problems.

It appears to me that an organization is like an organism which has its own survival objective. Generations of employees come in young and go out aged, providing their youthful energy to sustain the organization in its journey towards its survival objective. Thus the age of the organization is not bounded by that of individual persons.

The individual is finite while the collective being, that is, the organization is infinite. The key lies in the individuals working with PASSION, allowing their energy to converge and align with the organization survival objective. This term of mine "survival objective" is probably what modern management calls the "vision" of organizations. It lies at the heart of the organization as a living organism.

制度上。更重要的是需要有能力感應社會環境的變化和自我調節適應，這方面就要靠員工的集體智慧了。

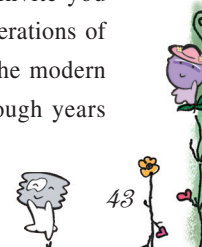
今次在歷史博物館的展覽，希望讓大家看到香港天文台的生命力，在於堅持「以科學為基礎，以服務為目的」的信念，一步一腳印，從一個小型觀象台，回應著香港社會由小漁港到國際大都會的轉變，逐步演化成今天提供一系列錯綜複雜資訊服務的氣象及地球物理機構。

願望大家來到歷史博物館參觀時，不單是看文物和儀器，還請留意歷代天文台人持續多年的努力，他們不斷調整適應，才有今天的香港天文台。當你看到天文台人二次大戰時在赤柱戰俘營內生活極度艱困的情況下堅持進行氣象觀測紀錄，令天文台成為香港淪陷期間仍然維持運作的唯一政

For an organization to survive and sustain, it also requires a collective memory to accumulate experience and capability. This is often expressed in the form of established processes and procedures. But what is even more important for the organization is an ability to sense changes in the social circumstances and to self-adjust to adapt. That would depend on the collective wisdom of its employees.

I hope that you would see at our exhibition at the History Museum that the energy of the Hong Kong Observatory is derived from the guiding principle "service based on science". Never swerving from this principle, step by step, we transformed ourselves from a small observatory to a modern meteorological and geophysical institution delivering a complex array of information services, responding to Hong Kong's own metamorphosis from a small fishing village to a world metropolis.

When you visit the exhibition at History Museum, don't just admire the artifacts and instruments. I invite you to see through them how generations of Observatory people created the modern Hong Kong Observatory through years







府部門，也許你會對天文台人「敬業樂業」的境界有所感動。

香港天文台的歷史，說到底是一部天文台人的歷史。謹以這次展覽向歷代及現職的天文台員工致以崇高敬意！

林超英  
2008年7月23日

of hard work and constant adjustments. When you see the meteorological records made by observatory staff imprisoned at the Stanley concentration camp during the Second World War, remember that the observations were made under extreme hardship when even staying alive was a non-trivial task. Do realize also that the Hong Kong Observatory was the only department of the Hong Kong Government which continued to carry out its basic function during the occupation period. Maybe you would then appreciate how far PASSION drives the people of the Observatory.

The history of the Hong Kong Observatory is in the final analysis a history of its people. This exhibition represents our sincere salutation to all past and current staff of the Hong Kong Observatory.

C Y Lam  
23 July 2008



## 病房外望

### *Watching from my hospital room*

今天在醫院渡過了第三天。

病房的大窗面向正北，遠眺大帽山，上面有一片廣闊的天空，是觀察風雲變幻的好地方。

This is my third day in the hospital.

The window of my room faces north, with Tai Mo Shan in the distance and a good view of the sky above. This is an excellent post from which to observe the changing winds and clouds.





前兩天窗外的雲都是從左往右移動的，反映了較早時颱風鳳凰登陸福建後為華南帶來的西南季候風。積雲不斷成長消散，偶然還有一兩陣驟雨飄過，隔著窗也感覺到一片清新氣象，跟數天前的悶熱迷濛簡直就是兩個世界。來自西南方海洋的氣流不著人間煙火，送來的是自然的呼吸。

今天窗外的雲變了方向，反過來從右往左移動，稍為留心更可以見到幾條從東南伸向西北的「雲街」，一團一團的雲沿著幾條平行的路線走，跨過九龍半島的雲走到一半大都消散淨盡，但是跑到大帽山上空的卻顯得精力充沛，長得特別高大。

這些情況反映太平洋的高壓脊向西伸展來到華南，脊邊的東南風取代了西南季候風，天氣逐漸趨向穩定，不過日間

In the past two days, clouds were all moving from the left to the right. It was a reflection of the south-westerly monsoon brought to southern China by Typhoon Fung-wong which had earlier landed in Fujian. The cumulus clouds grew and dissipated incessantly. From time to time, a shower or two would pass by. I could feel the freshness of the air even sitting behind the window. It made the stuffy heat and haziness a few days back look like another world. The oceanic air coming to Hong Kong from the south-west is untouched by human smoke and fire. It brings with it the breath of Nature itself.

Today, looking through the window, the clouds have changed direction. They now move from the right to the left. Closer watching reveals that the clouds organized themselves into several "cloud streets" which run from the south-east to the north-west. Puffs of cloud move along several parallel tracks. Those crossing the Kowloon Peninsula tend to dissipate on the way. Those approaching Tai Mo Shan show much more energy and grow tall and high.

The signs are that the Pacific ridge of high pressure is extending westward to southern China and that the south-

炎熱內陸仍有可能刺激局部地區性驟雨的形成。

在這種東南風天氣裏，市民最高興的除了是海風習習，更可能是空氣的清澈澄明。從我的病房外望，大帽山頂的雷達站清晰可見，近在眼前。來自太平洋的空氣，一塵不染，仿如透明。

黃昏7時15分，病房西北不遠處的京士柏氣象站放出紅色的大氣球，迅速高升，並隨著東南氣流飄往大角咀方向，不久就消失在漸暗的暮色中。它帶著儀器量度氣溫、濕度、氣壓、風向、風速，在天文台總部當值的同事稍後便會知道香港上空的氣象情況，加上大範圍的氣象信息，他們便可以推算明天的天氣。

在病房我不掌握全部資料，但是可以想像高壓脊邊緣的東南風和撤退不遠的西南季

easterly winds on the edge of the ridge are displacing the south-west monsoon. Weather will become more stable, but the day-time heating inland could still trigger off isolated showers.

Apart from the gentle breeze from the sea, what people particularly like about the weather in a south-east wind regime like this one is probably the clear, pristine air. From my hospital room, the radar station on top of Tai Mo Shan looks as if it were just a few feet away. The air from the Pacific is free of dust and appears virtually transparent.

7:15 p.m. - a big red balloon is released by the King's Park Meteorological Station, a short distance to my north-west. It rises quickly, flying towards Tai Kok Tsui following the prevailing south-easterly winds. It soon disappears into the dimming twilight. The package of instruments which it carries measure air temperature, humidity, air pressure, wind speed and direction. Soon afterwards, colleagues at the observatory headquarters will know how it looks like above Hong Kong. Together with weather information from the region, they could then predict the weather for tomorrow.







候風，有機會在相互爭持之中形成一些低氣壓區，出現在南海北部香港附近。

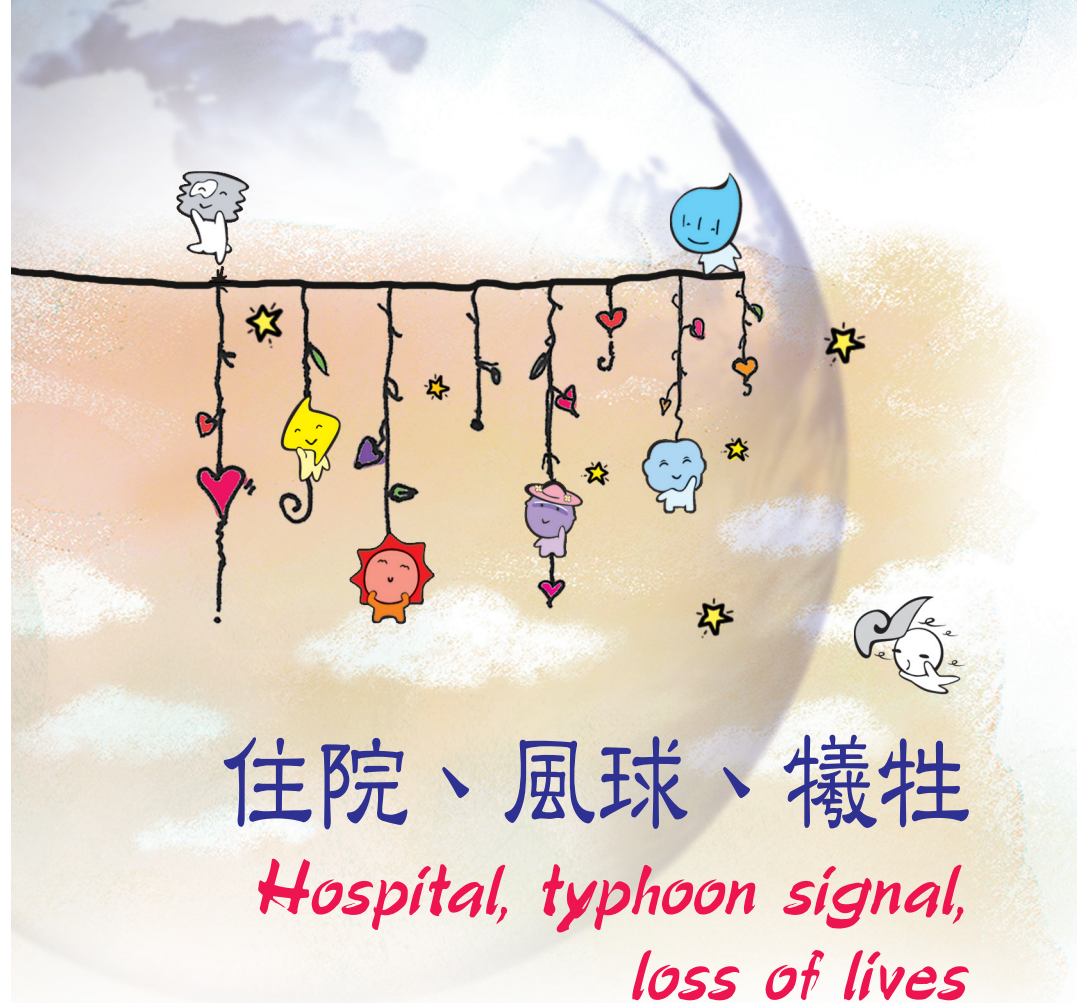
奧運開幕日漸近，天文台同事已經在沙田馬術賽場觀察天氣一星期了，心中多了一分牽掛。低氣壓區會帶來狂風暴雨？還是最適合馬術比賽的欲雨還晴天氣？不過無論陰晴，我們都一定好好地守住這片天空。

林超英  
2008年8月1日

In my hospital room, I don't have all the information. But I could imagine the south-easterly winds at the edge of the Pacific ridge engaging with the south-west monsoon which has not retreated very far. This conflict could eventually lead to the formation of low-pressure areas in the northern part of the South China Sea near Hong Kong.

The opening of the Olympic Games is getting close. Observatory colleagues have already started taking weather observation at the equestrian venue at Shatin for a week. Thinking about the event is becoming a preoccupation. Would the low-pressure areas bring high winds and heavy rain? Or would it instead bring the perfect weather for the equestrian event, with a mostly cloudy sky but little more than a brief shower or two? No matter what happens, one thing is sure. We shall be keeping a close watch all the time.

C Y Lam  
1 August 2008



今天病假結束重新上班，祇不過離開了十二天，已經恍如隔世。

7月29日晚上躺在地板上靜待救援的時候，我在想：「以後還能上班嗎？」感謝救護人員和急症室醫護人員助我脫離

Today I return to work at the end of my sick leave. I have been away for 12 days but it seems like ages.

29 July evening : as I laid on the floor waiting for the ambulance, I was thinking, "Could I come back to work again?" I must thank the ambulance crew and the medical team at the Emergency Ward who got me out of trouble.





困境。

7月30日至8月5日在醫院，看看天上的雲，打1878200聽最新天氣報告，我能做的天氣工作不多。住院期間，所見醫生、護士以及各種輔助及助理職級人員都勤奮用心，細緻照顧病人，但是仍然要面對一些無理的埋怨甚至責罵，實在十分不正常，作為旁觀者我感到很難過，為甚麼社會上總是有人祇見負面，不見他人的努力？

8月5日中午出院，醫生告誡我還要盡量休息，病假放到8月9日。看著熱帶氣旋逼近，我跟署理台長李本澄博士通了電話，拜託他主理風球的事。

8月6日凌晨，被風聲吵醒，忍不住提起電話聽筒準備問預報中心同事究竟是甚麼情況。不過遲疑了一會兒，終於沒有撥電話號碼，而是放下聽筒，上牀睡覺。我想我必須學

30 July to 5 August: I stayed in the hospital. I could do no more meteorology than watching the clouds and calling 1878200 to listen to the latest weather reports.

While in the hospital, all the people I met viz. doctors, nurses, paramedical and other supporting personnel took good care of patients, working hard and passionately. But still I saw people blindly blaming and criticizing them. It was very unreasonable and I felt very sorry for the situation. Why are there always these people who see things only negatively, without appreciating that others are working hard to help them?

5 August: I left for home around noon. Doctors warned me that I must take good rest and gave me sick leave till 9 August. Seeing that a tropical cyclone was edging close to Hong Kong, I called Dr B.Y. Lee, acting director, to discuss about the situation. I requested him to take charge of the typhoon signals.

6 August: howling winds woke me up in the small hours. I could not resist picking up the phone, intending to ask colleagues at the forecasting office what was happening. But then I hesitated. I

懂相信制度，相信系統，相信同事。

8月6日八號風球生效半天，平時繁忙紛擾的大都會在風暴到臨期間的整體應對井井有條，在香港住慣的人不覺得是一回事，甚至還有一些在雞蛋裏挑骨頭的批評，但是國際上的氣象同行以及搞民防的朋友都覺得香港的整個熱帶氣旋預警和應變系統簡單而有效，好到不可思議，是世界各地學習的對象。

8月9日馬術項目開始在香港進行，上次網誌寫了我的牽掛，幸好上天最後給了香港「欲雨還晴」，是最好不過的天氣。

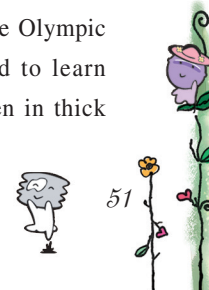
8月10日，閱報知悉一位交通警員在為奧運執勤時交通意外殉職，然後驚聞兩位消防員為了救人自己犧牲在濃煙之中。公務員為市民服務，不祇付出血汗，甚至付出生命。謹

stopped short of dialing the number. I hung up the phone and went back to sleep. I thought that I must learn to trust the procedures, the system and the people.

Signal number 8 was in force during the day. The normally busy city responded to the onslaught of the storm in an orderly manner. Long-time Hong Kong citizens would take it for granted. Some even tried to figure out tiny things which they could criticize. But the overall scheme of typhoon warning signals and community response in Hong Kong is in fact the envy of our meteorological counterparts as well as civil defense people worldwide. The system is so simple and effective, to the extent of being incredible. It is a model which many try to emulate.

9 August: the equestrian event started in Hong Kong. Last time I wrote about my worries about the weather in my blog. It turned out that we enjoyed the best possible weather, that is, cloudy without rain.

10 August: I read in the newspaper that a traffic policeman lost his life in an accident while on duty for the Olympic Games. Then I was shocked to learn about the loss of two firemen in thick







向三位同事致以崇高敬禮。

藉此機會，我向所有前線服務市民的公務員以及醫護人員致敬，他們每天面對無數無理批評而繼續緊守崗位，提供優良服務，令人佩服。

我又呼籲大家多看正面，多些感恩他人為自己提供服務。在互相尊重的祥和氣氛裏，大家可以活得更加開心舒暢，何樂而不為？

今天上班，我提醒自己，在日常生活中要多些說「多謝」。

林超英

2008年8月11日

C Y Lam  
11 August 2008

smoke while trying to rescue people. Civil servants don't just shed sweat and blood; they even sacrifice their lives in delivering service. Here are my solemn salutes to my three dear colleagues who passed away.

I take this opportunity to pay my tributes to all civil servants and medical personnel working in the front-line. They face countless unfair criticisms day in and day out but still they persevere in delivering quality service. They truly deserve our great respect.

I also invite fellow citizens to look more on the positive side and to be thankful to people who serve us. In a world of peaceful mutual respect, we would all live more happily. Why not give it a try?

Back at work today, I remind myself that I should say "thank you" more often everyday.



## 鸚鵡襲港

### Nuri in Hong Kong

8月20日至23日，為了颱風鸚鵡襲港，天文台全體同事忙了四日三夜，謹向他們致以衷心謝意。

22日鸚鵡的風眼中心下午5時左右在西貢一帶登陸後，詭異地折向西面橫過維港，掠

During the passage of Typhoon Nuri between 20 and 23 August, Observatory colleagues were terribly busy for four days and three nights. Here come my most sincere thanks to them for their great efforts.

Around 5 p.m. on the 22nd, the centre of Nuri's eye landed near Sai Kung. It then made a mysterious turn towards the west, crossing Victoria Harbour, skirting to the





過青衣以南和跨過大嶼山東北部，然後轉向西北，穿越屯門、元朗一帶，下午9時進入后海灣（見圖），為時長達四小時，加上風眼比較大，很多地區在風眼經過時感受到風勢輕微的時間都比較長，令部份人產生錯覺以為鸚鵡風力不強。

其實今次香港真是無比的幸運。首先，奧運馬術比賽前後都有颱風卻竟然巧妙地避開了。其次，鸚鵡的移動軌跡稍有變化，市區的風勢都可以強勁得多。

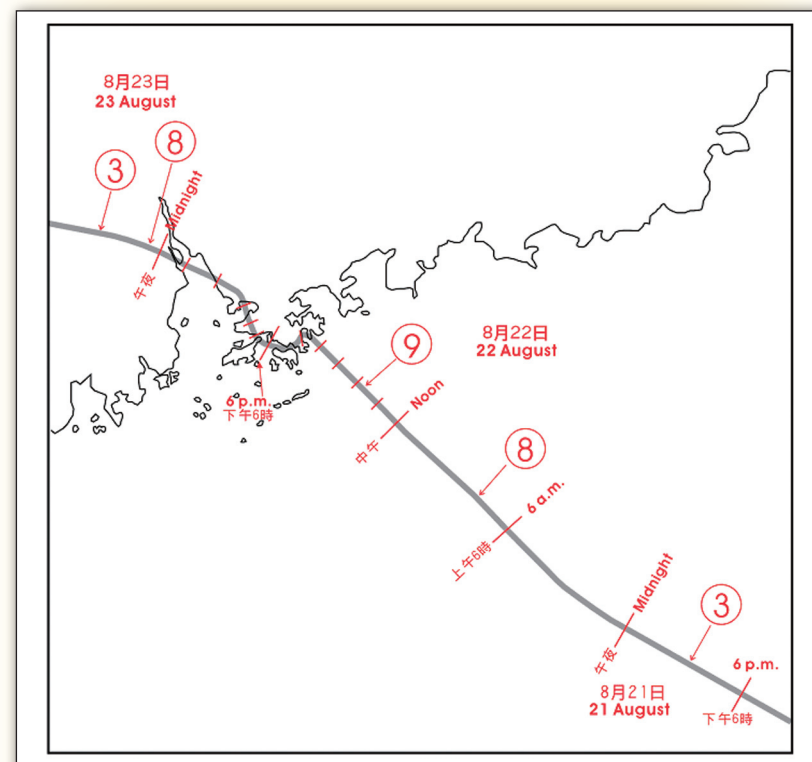
22日上午到下午初期鸚鵡靠近期間，香港吹北至西北風，由於受到新界山巒的遮擋，市區風勢比空曠地區低得多。風眼過境後西移速度增加，使得一般所謂「風尾」吹西南風的時間相對地短，造成的破壞也就幸運地少得多。

如果鸚鵡的路徑稍有變化，整體向西移動二、三十公

south of Tsing Yi and crossing the north-eastern corner of Lantau. A north-westward turn followed, taking the centre across the Tuen Mun – Yuen Long area. It entered Deep Bay by 9 p.m., four hours after landing. Because the size of the eye was also large, the winds in many places were fairly light for a rather long time. It created for some people the impression that Nuri did not bring very high winds.

Hong Kong has indeed been incredibly lucky lately. Firstly, the Olympic equestrian event was sandwiched between two typhoons and yet it miraculously escaped their impact. Secondly, had there been small deviations in the track of Nuri, the urban areas would have been hit by much higher winds.

During the approach of Nuri in the morning and the early afternoon of the 22nd, Hong Kong was under northerly to north-westerly winds. Owing to the sheltering effect of the hills in the New Territories, winds in the urban areas were much lighter than those in exposed areas. Furthermore, owing to the enhanced westward movement of the eye after crossing Hong Kong, the typical south-westerly squalls in the “typhoon’s tail” lasted shorter than usual. We therefore escaped with great luck much of the damage that those squalls could have caused.



圖一：颱風鸚鵡路徑示意圖—如果把21日的路徑向前直推，鸚鵡會在香港以南掠過。另外留意在香港境內的左拐右轉，以及橫過香港之後的忽然西折。帶有圓圈的箭咀顯示發出風球時鸚鵡的位置。

Figure 1 : Schematic track of Typhoon Nuri : If the track on the 21st is extrapolated forward, Nuri would have passed to the south of Hong Kong. Note also the meandering track within Hong Kong as well as the sudden westward turn after crossing Hong Kong. The arrows linked to the circles show where Nuri was when the relevant typhoon signals were issued.







里，鸚鵡便會變成在香港南面掠過，類似1999年需要發出10號風球的颱風約克，我們面對的將是另一個完全不同的局面。風向的轉變是西北—東北—東南，維港會暴露在鸚鵡前方的強勁風力之中。又如果鸚鵡過港後主要向北移動，則「風尾」會帶來駭人的狂風暴雨。

我寫下這些討論，目的是促進大家明白，過去這段日子香港的運氣實在好到不得了，並希望大家在生活中多抱持感恩的心情。

每次颱風過境，總有人對天文台的工作有這樣或那樣聚焦於負面的批評。香港是自由民主的社會，言論自由，百花齊放是理所當然的。我自己坦然面對，亦鼓勵同事把社會的聲音理解為對我們的重視，而且要在眾多紛紛擾擾的批評或意見中梳理出一些我們可以改

Had the overall track of Nuri shifted slightly, say 20-30 km towards the west, Nuri would have skirted to the south of Hong Kong, like Typhoon York in 1999, for which the number 10 signal was hoisted. We would have gone through a totally different experience. Wind direction would have veered from north-west to north-east and then to south-east. Victoria Harbour would have been exposed to the full force of the gales ahead of Nuri. In a different scenario, had Nuri spent more time moving towards the north after crossing Hong Kong, the “typhoon’s tail” would have brought frightening rain squalls.

I am explaining these potential situations with the hope that it would lead people to realize how incredibly lucky Hong Kong has been lately. Hopefully we would all learn to live with more thankfulness in our thoughts.

Every time after a typhoon passage, certain people would focus on the negative and criticize the Observatory for this or that fault. Hong Kong is a free and liberal society; all have the freedom to express their views. Thus I am open to such diversity of views. I also encourage my colleagues to see these views as a reflection of how much people value our service. Furthermore, I request them to distill from the numerous

進之處。

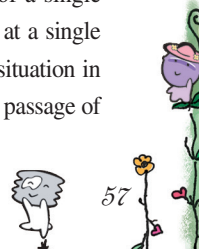
不過，當我們努力運作風球系統，保障了22日絕大多數打工仔避開在風眼逼近的風雨中使用擠逼不堪的公共交通回家的危險，竟然有人誣衊我們造假和發出不必要的8號風球。當我們發出9號風球以警告市民小心風眼經過和要留意風向突變和風力突然增強，竟然有人揶揄天文台因為不懂得發甚麼方向的8號風球才發出9號風球。言者也許無心，但是天文台同事卻真的傷心，假如我們用心工作之後所得的就是這些東西，請問以後怎樣發動大家的積極性呢？

我覺得最難過的是有報章報導，有人說風勢算不上「吹得郁人」，因此無需8號風球，這是以一個人在一個地點所見概括為全港情況的典型。事實是鸚鵡襲港最少二人死亡，70多人受傷，其中3人報章報導是

criticisms or opinions, ideas which we could employ to improve our service.

However, on this occasion, while we operated the signal system thoughtfully to ensure that most workers avoided the danger of returning home in severely crowded public transport and in rain squalls brought by the approaching eye, we were surprised to hear certain people alleging that we manipulated data to enable ourselves to issue a number 8 signal which was “unnecessary”. On another matter, we issued the number 9 signal to warn people of the passage of the eye and to alert them to sudden changes in wind direction and speed. But we were teased for doing so on the ground that we knew not which number 8 signal to issue in terms of direction. Whoever said these words might have done it inadvertently, but Observatory people are really hurt. If these are to be what we get in return for our hard work every time, how could people be motivated in the future?

What made me truly sad was a press report that someone claimed that the number 8 signal was unnecessary because winds were not strong enough to “move people”. This is a typical case of a single person projecting his experience at a single location to represent the overall situation in Hong Kong. The truth during the passage of





被風吹倒的。請問要再死傷多少人才需要發出8號風球？

在此，我呼籲大家在運用言論自由時，既要多一分理性，亦要多一分感性。擺事實，講道理，互相尊重，互相聆聽，才是自由民主的真諦，眾多的人們才可以在融合中發揮巨大的協同效應，為全體取得最大的幸福。

最後，我重複我對同事們的敬意。多年來他們用心工作，為香港社會作出多方面的貢獻，多年來他們面對數不勝數無理批評和謾罵，卻依然緊守在崗位上。有這樣的同事，人生何求！

林超英  
2008年8月26日

Nuri was that at least two persons lost their lives and 70 were hurt. According to press reports, three persons got hurt because they were blown off their feet. How many more people have to be killed or hurt before a number 8 signal is necessary?

May I call for a higher degree of rationality as well as sensibilities in the exercise of the freedom of speech? In discussions, we should state the facts, explain the reasons, mutually respect each other and listen well. Then we would be truly living the spirit of liberty and democracy. Only then would we derive synergy through the harmonious amalgamation of the energy of the individuals for the greater public good.

Finally, I must reiterate my gratitude to my colleagues at the Observatory. For many years, they have worked passionately and contributed in many ways to the well-being of Hong Kong. For many years, they have to suffer innumerable unreasonable criticisms and groundless insults. But still they persevere and deliver service to the public with unswerving dedication. With such colleagues, what more could I ask for!

C Y Lam  
26 August 2008



## 局外人看鸚鵡

建議大家閱讀網上一篇文章，看看一個局外人怎樣理解天文台在鸚鵡襲港期間的工作，請到：<http://hk.myblog.yahoo.com/chicken-goal/article?mid=292>。

我不認識作者，感謝他以客觀的事實說明天文台在過程中作出決定的難處，以及22日上午發出八號風球時間取捨之間的考慮等等。

香港不是一面倒地負面，我希望亦相信，香港人走在一起有能力客觀和理性地認識和處理問題。

林超英  
2008年8月28日

## *An outsider writing on Nuri*

I would like to recommend a blog article to you. You would see how an outsider views the work of the Hong Kong Observatory during the passage of Nuri over Hong Kong. Go to the link : <http://hk.myblog.yahoo.com/chicken-goal/article?mid=292>.

I don't know the author. I would like to thank him for explaining, in layman terms and based on objective facts, the tricky issues the Observatory faced in making the various decisions during the event. He also explains well the factors involved in considering the various alternative timing possibilities for the issuance of the number 8 signal.

It shows that not all Hong Kong people are stuck with the negative. I wish and believe that we Hong Kong people coming together could understand and handle problems with objectivity and rationality.

C Y Lam  
28 August 2008







## 擺事實，講道理， 互相尊重，用心聆聽

### *Facts, reason, respect, listening*

#### 談「清晨」

鸚鵡襲港後，有意見認為天文台21日說過22日清晨發出8號風球機會不大，後來於上午7時40分發出了是前後矛盾，是誤導。23日9號轉8號也有類似意見。討論焦點在「清晨」的

#### About “early morning”

[Translator's note : the subject of this article is a Chinese term qingchen which is usually translated as “early morning”. The discussion makes references to Chinese dictionaries. Thus it is not particularly easy to translate.]

意義。

前幾天我說過自由民主的社會應該學懂擺事實，講道理，互相尊重，用心聆聽，以下我就嘗試以這種精神談「清晨」。

24日在一個公開場合接受記者訪問時提到，在我的理解中，「清晨」和「凌晨」意義相等，隨後有言論指我不懂中文。幾天來我沒有辯駁，因為我要做功課，搜集材料，認真學習。我又要跟同事討論怎樣在這方面改進我們的工作。

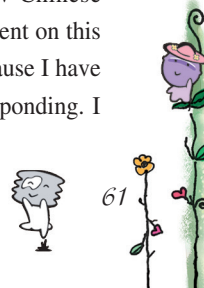
公務員事務局法定語文事務部的同事幫我找到字典詞書中有關「清晨」和「凌晨」的條目(見附表)，以下的討論我自己執筆撰稿，也因此由我自己負責，如有不滿要罵人請罵我，不要殃及池魚。

如表中所示，《中文大辭典》、《辭源》、《漢語大詞典》、《重編國語辭典修訂

After the passage of Nuri, the Observatory was criticized by some people. The Observatory said in the evening of 21 August that the chance of issuing a number 8 signal in the “early morning” (qingchen in Chinese) would be low and the signal was eventually issued at 7:40 a.m. Some considered that the Observatory had issued conflicting and misleading information. Similar criticisms were raised regarding the change from number 9 to number 8 on 23 August. The focus of the discussion was on the meaning of qingchen. (There was no corresponding criticism in the English-speaking press.)

A few days ago, I wrote about the importance of sticking to “facts, reason, respect and listening” in a free and democratic society. I shall make an attempt to illustrate this spirit in the following discussion on qingchen.

When I spoke to the press on 24 August, I explained that in my understanding of the Chinese language, qingchen and lingchen (usually translated as “the small hours”) are synonymous. Criticisms that I did not know Chinese immediately followed. I was silent on this matter in the past few days because I have to do my homework before responding. I





本》四種都有「清晨」和「凌晨」互通的說法。因此，「清晨 = 凌晨」有一定論據，不是完全錯誤。

詳細檢視材料之後，我發現一個趨勢。在列表裏，「清晨」於早期是「日出前一段時期」（見《辭源》），1990年代有「日出前後」的說法（如《漢語大詞典》），2000年代再有「太陽剛出來」的說法（如《應用漢語詞典》），有逐步推遲的傾向，由於多個說法並列，「清晨」的意思比以前模糊了。

另一方面，「凌晨」的意思由原來的「清晨」、「清早」（《中文大辭典》和《辭源》）到後來大部份詞書的「天將亮」或「天快亮」，本來分別不大，但是1990年代多了「泛指午夜至天亮」之類的加註，把「凌晨」的起點上推到午夜。（有人罵我們不應該用「午夜」這個詞，指應為「子

have to collect and study related reference material. I also have to discuss with my colleagues about how we might improve our service in terms of communication with the public.

Colleagues of the Official Languages Division of the Civil Service Bureau helped me locate references to qingchen and lingchen in Chinese dictionaries (see table in the Chinese version, <http://www.weather.gov.hk/blog/b5/index.htm>). The following discussion is written by me and so is purely my own responsibility. Anyone who does not feel happy with it please scold me and not anybody else.

For those who could read Chinese, you would see in the table that four sources treat qingchen and lingchen as equivalent. So saying that “qingchen = lingchen” is not groundless and could not be said to be completely wrong.

After studying the table in detail, I notice also a certain trend. In the table, qingchen was listed as “the period before sunrise” in the earlier years. In the 1990s, “the period around sunrise” started to appear in some references. By 2000s, some references even stated “just after sunrise”. Thus qingchen increasingly stands for a later time of the day. Owing to the co-existence of several explanations,

夜」，這是另外一個故事。）

此消彼長，數十年間，「清晨」和「凌晨」漸漸出現一些差距，總體的印象是「清晨」移向日出，「凌晨」靠近午夜，不過這祇是概括的說法，在2007年《重編國語辭典修訂本》裏，「凌晨」釋義依然是「清晨」。

讀者也許開始頭昏腦脹，奇怪何以「清晨」、「凌晨」會搞出這一大堆東西，也許另外有人罵我東拉西扯，死不認錯。以上我想展示的是：尋求真理，其實不是「拍心口，想當然」，往往很費功夫，而且要花很大氣力才能梳理出很小的道理。

我跟同事一起看過字典詞書的材料，反覆研究討論，再考慮了（即是聆聽了）鸚鵡過港後各方給我們的反饋，我們決定尊重大家認為「清晨」意義模糊的意見，把它剔出天文台工

the meaning of qingchen is becoming less clear.

On the other hand, in the earlier references, qingchen was listed as equivalent to lingchen. In later years, other references treated it as “sky about to light up”, which makes little difference. However, in the 1990s, some references added a note like “generally indicating the period from midnight to dawn”. Thus the starting time of lingchen is shifted forward to midnight.

Contrasting the evolution of the two terms in the past few decades, qingchen and lingchen have apparently diverged somewhat. The impression is that qingchen shifts towards sunrise and lingchen, towards midnight. But this is just a generalization. A reference in 2007 still treats the two as synonyms.

Some readers might begin to feel headache with this complex mess arising from the two “simple” terms. Others might scold me for talking rubbish and refusing to admit having made a mistake. But I wish to show that it takes much effort to find out what truth is. Indeed very often all that one finds after spending an enormous amount of effort would be just a tiny little piece of truth. Truth is not derived from bluffing.







作詞彙之外，此後如果要提午夜後到天亮前這段時間，我們將採用「凌晨」（英文對應是in the small hours）。

另外有人提議天文台從此以後祇談時間鐘點，不提上午、下午之類的詞語，這是一個完全不同性質的題目，牽涉到人與人之間以語言溝通的基本問題，將來有機會再談。

林超英  
2008年9月1日

My colleagues and I have studied thoroughly what the dictionaries say. We have also considered carefully, that is, listening to the feedback from various stakeholders after the passage of Nuri. We have decided to respect the view expressed by many that the meaning of qingchen is not clear enough. From now on, we shall remove it from our working vocabulary. Whenever we wish to refer to the period after midnight and before dawn, we shall adopt lingchen, the English translation of which is “the small hours”.

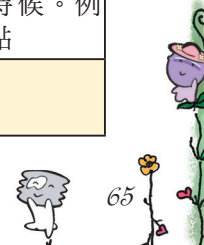
Some people have further suggested that from now on, the Observatory should stop using terms like “the morning” and “the afternoon” and should only talk in terms of specified clock hours. This is a totally different subject. It relates to the fundamental question of how human beings use language to communicate with one another. I shall find another occasion to discuss it.

C Y Lam  
1 September 2008



## “清晨”、“凌晨”釋義

| 資料來源                | 清晨                            | 凌晨                             |
|---------------------|-------------------------------|--------------------------------|
| 《中文大辭典》；1968年       | 早晨                            | 清晨                             |
| 《辭源》；1983年第1版       | 清早，指日出前一段時間                   | 清早                             |
| 《新編漢語詞典》；1988年第1版   | 指日出前後的一段時間                    | 天亮以前的一段時間，多指天快亮的時候。例如：凌晨四點集合出發 |
| 《朗文中文高級新辭典》；1996年初版 | “清曉”：也稱“清旦”、“清晨”，指太陽出來前後的一段時間 | 凌：迫近、接近。例如：凌晨                  |
| 《商務現代中文詞典》；1997年第1版 | “清曉”：天剛亮的時候；清晨                | 天將亮的時候，泛指午夜到天亮。例如：凌晨三點         |
| 《漢語大詞典》；1997年第1版    | 早晨。指日出前後的一段時間                 | 迫近天亮的時光；清晨、清早                  |
| 《辭海》；1999年彩圖本第1版    | -                             | 天快亮的時候                         |
| 《應用漢語詞典》；2000年第1版   | 清早，太陽剛出來的一段時間                 | 天將亮的時候，泛指午夜至天亮一段時間。例如：凌晨五點鐘    |
| 《現代漢語規範詞典》；2004年第1版 | 一般指天亮到太陽剛出來不久的一段時間            | 臨近天亮的時候，指午夜後至天亮前               |
| 《現代漢語詞典》；2005年第5版   | 日出前後的一段時間                     | 天快亮的時候。例如：凌晨三點                 |
| 《重編國語辭典修訂本》；2007年   | 天剛亮時，亦作“清曉”、“清早”              | 清晨、黎明                          |





# 風眼殺機

## *Typhoon eye kills*

在進入正題之前，讓我對關心天文台的人們表示衷心謝意。過去兩個多星期，眾多朋友和素未謀面的市民或來電來函，或在報章及互聯網發言，對我们的工作給予正面評價，並鼓勵我們繼續憑著科學和愛

Before talking about typhoon eyes, let me express my sincere thanks to all those who care about the Observatory. In the past two weeks or so, many friends and people unknown to us have called by phone, sent letters and e-mail messages, and written letters to the editor and in internet forum, to say positive things about our work. They encourage us to

心為市民服務。在同事之間由於無理責罵引起的負面氣氛得以畧為紓解。多些互相尊重，多些互相讚賞，香港的明天才更有希望。

言歸正傳，8月22日颱風鸚鵡的中心橫過香港期間，多處地區風勢和雨勢都明顯減弱，天空甚至見到藍天，這是「風眼」經過的天氣，在寧靜中潛伏著巨大殺機，我們在每小時更新的熱帶氣旋警告中不斷提醒市民提防風勢會突然增強，以免措手不及。我們感到遺憾的是最終還是有人在這個關鍵時刻傷亡。

風眼過境不是常有的事，就讓我們一起從今次的經驗中學習。首先看看風力的變化（圖一）。風力明顯有兩個高峰，一個在風眼到達之前，一個在風眼經過之後，中間有一段時間風力相對微弱，也就是風眼經過的時刻。

continue to serve Hong Kong with science and with love. This visible support has helped remove to some extent the negative atmosphere in the department arising from groundless scolding which my colleagues suffered after Nuri.

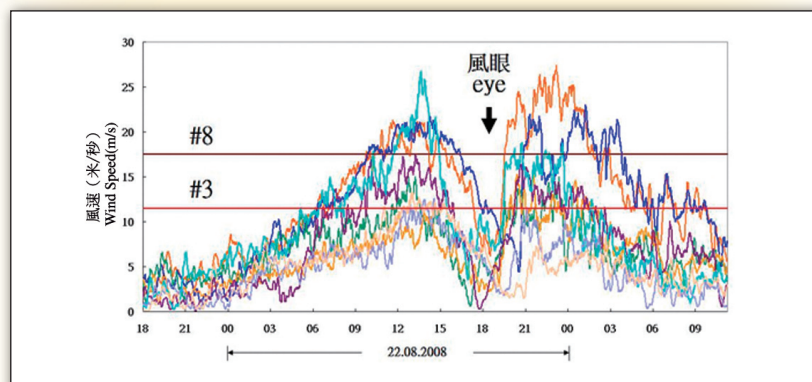
Now, back to business. Nuri's centre crossed Hong Kong on 22 August. During that period, winds and rain in many places were light and some even had glimpses of the blue sky. This is typical weather associated with eye passage. Hidden behind the apparent calmness is a great potential to kill. In hourly tropical cyclone warning bulletins issued on that day, we kept on prompting people to prepare for the sudden jump in wind strength. Our greatest regret is that still people got killed during this critical period.

Typhoon eyes don't cross Hong Kong often. It is important to learn from the experience. Let us first look at the variation in wind speed (figure 1). There were two obvious peaks, one before eye arrival, another one after. Winds were relatively light in the middle. That was when the eye passed overhead.

The danger of the typhoon eye lies in its apparent calmness. People are misled







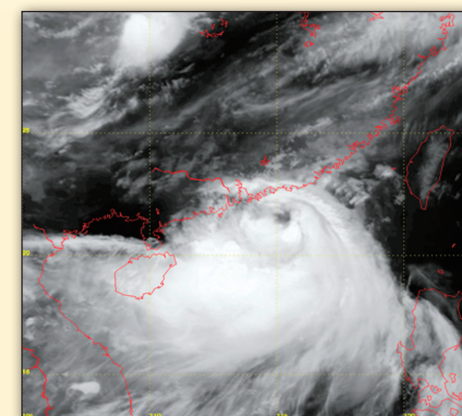
圖一：鸚鵡襲港期間，發出熱帶氣旋警告信號所用八個參考站錄得的風速記錄。  
「#3」和「#8」標記發出3號和8號風球的風力水平。  
Figure 1: The wind traces at the eight reference anemometer stations for tropical cyclone signals during the passage of Nuri. “#3” and “#8” indicate the threshold wind speed values for the number 3 and number 8 signals.

在成熟的颱風裏，風眼除了是一個微風區，更是一個晴空區，四周有一個由高達十多公里的積雨雲組成的圓形「眼壁」，在較弱的颱風裏（以及強烈熱帶風暴），圓形的眼壁有缺口，而且風眼內有些不均勻的低雲，雲隙之間偶然出現陽光與藍天。接近香港時的鸚鵡從人造衛星下望就是這種狀態（圖二）。

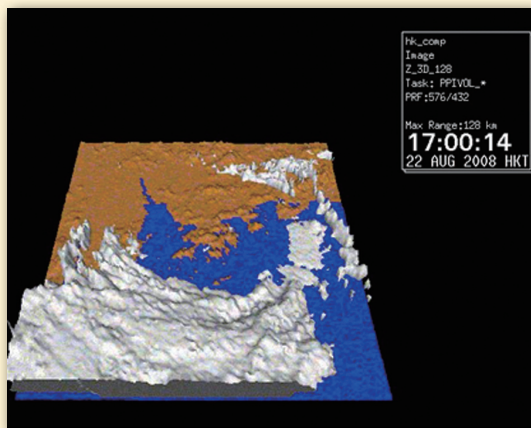
In a mature typhoon, the eye is an area of fine weather apart from being calm. It is surrounded by a circular “eye wall” consisting of towering cumulonimbus clouds more than 10 kilometres high. In weaker typhoons (as well as severe tropical storms), the eye wall is broken and incomplete. Furthermore, some low clouds also exist inside the eye. Sunshine would get through cracks in the cloud cover and the blue sky is seen here or there. This was the situation in Nuri as it approached Hong Kong (figure 2).

風眼危險之處在於令人誤會風暴已經過去，把人誘到戶外甚至海裏，然後狂飆突起，殺人於轉瞬間。8月22日鸚鵡正面襲擊香港，我們預計會出現這種情況，因此發出九號風球，並重複又重複地在警報中解釋風眼可能帶來的突然變化。今次的風眼比較大（見以下討論和圖三），鸚鵡移動又比較慢，結果九號風球生效的時間特別長。

into thinking that the storm is over and are lured to go outdoors or even into the sea. Then maddening squalls strike and kill instantly. When Nuri struck on 22 August, we realized that this could happen. To cope with this, the number 9 signal was issued. We repeated and repeated in our warning bulletins the message that the eye would bring sudden changes in wind. On this occasion the eye was rather big (see discussion below and figure 3) and its movement was rather slow. Thus the number 9 signal was in force for an exceptionally long duration.



圖二：8月22日上午7時颱風鸚鵡的紅外線衛星圖像，「風眼」不是完整的圓形，但尚算清晰可見。另外留意它的大小，跟香港全境相若。  
（圖像接收自日本氣象廳的多用途輸送衛星-1R。）  
Figure 2: The infrared satellite picture of Typhoon Nuri at 7 a.m. 22 August.  
The circular eye was incomplete though clearly distinguishable.  
Note its size which was comparable to that of the whole Hong Kong.  
(The image was originally captured by the Multi-functional Transport Satellite-1R of Japan Meteorological Agency.)



圖三：8月22日下午5時立體雷達圖。  
Figure 3 : 3-dimensional radar picture at 5 p.m. 22 August

雷達圖像也可以幫我們看到風眼。為了方便不太認識氣象的朋友，我選用了一張下午5時的立體雷達圖（圖三）。當時鸚鵡中心（以地面風向計）位於西貢一帶，眼壁的圓圈直徑多於100公里，眼壁離開香港最近的一點也有二十多公里之遙。

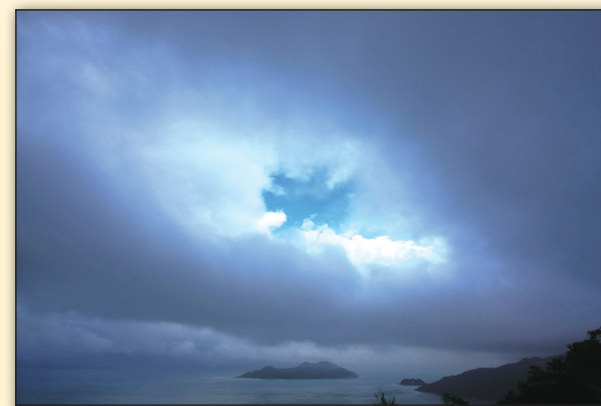
鸚鵡過港期間有一些市民拍攝到在密雲中出現藍天的照片，對於是否「風眼」有一些討論。其中較多人看過的照

The radar also helps us “see” the typhoon eye. To make things easier for people who are not familiar with meteorology, I have picked the 3-dimensional radar picture at 5 p.m. on that day (figure 3). According to surface wind observations, Nuri’s centre was located in the Saikung area. The diameter of the circular eye wall exceeded 100 kilometres. Even the closest point was more than 20 kilometres away.

Several people have taken photographs of blue sky being seen in an overcast sky during the passage of Nuri. There were discussions about whether it was the “eye”.

片是李浩民先生拍攝的（圖四）。根據以上解釋，風眼的眼壁當時位於數十公里外，因此畫面見到的是風眼中低雲層內的間隙，而不是在畫面以外很遠處的風眼眼壁。從這個意義來說，把當中一小片藍天理解為風眼是不合適的。不過話說回來，拍照的時與地跟鸚鵡中心登陸西貢一帶的時間相當吻合，所以可以肯定照片是風眼內的景像，其實也是十分難得的。

The photograph seen by most was taken by Mr Alman Li (figure 4). As explained above, the eye wall then was tens of kilometres away. What one sees in the photograph is an opening in the low cloud layer in the eye and the eye wall was too far in the distance to be captured. Thus it is not appropriate to label the small piece of blue sky as the typhoon eye. Nevertheless, considering the picture was taken at a place close to the centre of Nuri as it landed around Sai Kung at the time, there is no doubt that the photograph captured what it looked like inside the eye. It is therefore still a most valuable record of the episode.



圖四：8月22日約下午5時在西貢銀線灣望向東北方拍攝到的照片，一少片藍天出現在密雲之中。感謝李浩民先生惠允轉載。  
Figure 4 : Photograph looking towards the north-east from the Silverstrand in Saikung area, around 5 p.m. 22 August. There was a glimpse of the blue sky in spite of the overcast condition. Courtesy of Mr Alman Li.





鸚鵡中心經過天文台總部時，雨停風靜，滿天蜻蜓，是美妙得有點詭異的奇景，隨後風尾的西南狂風卻震撼驚人。同樣地，李浩民先生在電話中向我的同事形容他享受身處於風眼中央的美妙感覺之後，當晚在西九卻飽受狂風疾雨的煎熬。寧靜過後，往往是另一場風暴。

藉此機會，再次請大家對颱風風眼提高警覺。風眼的寧靜隱藏著大自然的巨大殺機，下次碰上風眼過境，大家切要對天氣突變知所防範，更請大家幫忙廣為宣傳，不要再讓人們無辜地葬身在寧靜後的狂飆之中。

林超英  
2008年9月10日

附：天文台同事稍後會於本網站《教育資源》欄提供更詳細的技術討論，包括風眼在香港境內的複雜變化。

P.S. Observatory colleagues will provide technical discussions in greater detail in the "education resource" section of the website later. They will cover also the complex changes in Nuri's eye as it crossed Hong Kong.

When Nuri's centre passed overhead the Observatory headquarters, rain stopped. Hundreds of dragonflies filled the somewhat eerie calmness. The roaring south-westerly squalls in the "tail" of the typhoon which followed were however truly frightening. In relaying his experience to my colleagues, the photographer Mr Li reported the same: being in the eye gave him a wonderful soothing feeling, but being struck by rain squalls later in western Kowloon was horrible. Beyond calmness, there is often another storm in the waiting.

I take this opportunity to remind everybody to take care with typhoon eyes. Hidden behind the calmness of the typhoon eye is a great potency to kill. Next time one passes over Hong Kong, please do be prepared for sudden changes in weather. Please help me spread the message. Don't let people die avoidable deaths in the furious squalls following the calm.

C Y Lam  
10 September 2008

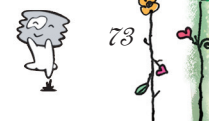
## 海高斯的奇妙故事 *The amazing story of Higos*

熱帶氣旋海高斯上星期六在粵西登陸後，地面上的環流減弱，降格成為一個低壓區，不過海高斯的奇妙故事這個時候才開始。

首先是海高斯登陸後如我們先前所料向右90度急轉彎，

Tropical cyclone Higos landed on western Guangdong last Saturday. Its surface circulation weakened and Higos was downgraded to a low pressure area. But its amazing story only started then.

Firstly, as we had expected, Higos made an abrupt 90-degree turn to the right after landing and edged closer to Hong Kong as it moved eastwards. Thus



改為向東移動逐漸靠近香港，因此我們始終留意著它的動靜，這段時間預報員有不少的憂慮，情況跟7月7日差不多（見7月9日網誌文章）。

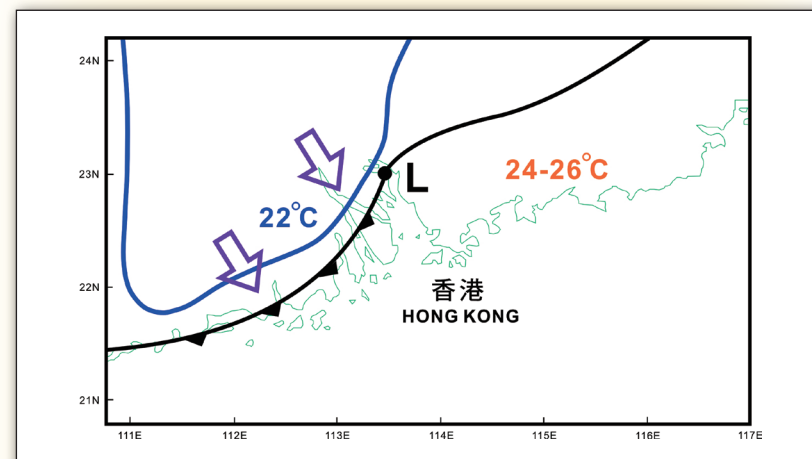
此外，海高斯的轉向跟大氣層中部所謂「西風槽」有關，這個西風槽的另一影響是星期日內地氣壓升高，推動較涼的空氣南下進入廣東，最終蹣上海高斯的殘餘低氣壓，引發一連串微妙的變化。

在海高斯中心以西地區，較涼的空氣得到海高斯殘餘低壓區的北風環流幫助順利南下，入夜後抵達廣東海岸，涼空氣的前緣可以視為一道冷鋒。在海高斯中心以東地區情況相反，由海洋吹入陸地的溫暖氣流頂住內陸清涼空氣南下的趨勢，形成一道「準靜止鋒」（也可視為低壓槽）。圖一顯示10月5日香港時間下

we maintained careful surveillance of its moves. Forecasters had a lot of worries during this time, rather like what it felt like on 7 July (see blog article dated 9 July).

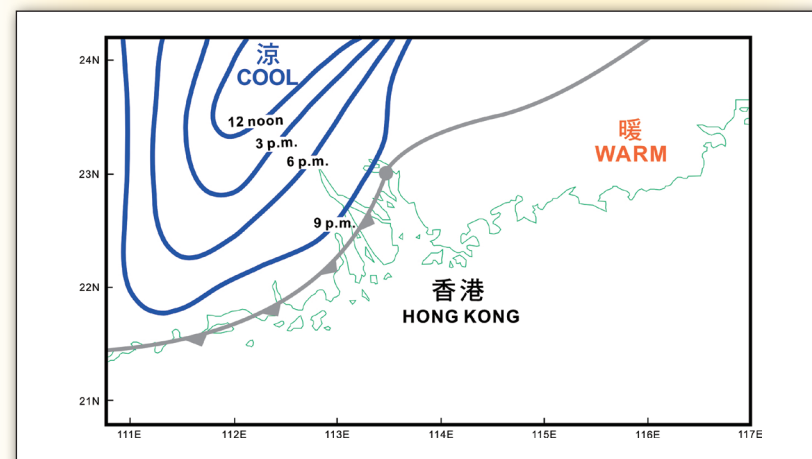
Higos turned under the influence of a so-called “westerly trough” at the middle layer of the atmosphere. The other effect of this westerly trough was a rise in the surface pressure in China mainland, pushing cooler air southwards into Guangdong. This air ran into the remnant low pressure area of Higos and brought a sequence of subtle changes.

To the west of the Higos' centre, the southward march of cool air was aided by the northerly winds in the circulation of the remnant of Higos. It reached the coastal area of Guangdong as night fell. The front edge of the cool air may be treated as a cold front. To the east of Higos' centre, the opposite happened. The southward march of cool air was resisted by the warm air coming in from the ocean. Where the two air masses met, we had a quasi-stationary front, which may also be seen as a low-pressure trough. Figure 1 shows schematically the weather situation at 9 p.m. 5 October. Figure 2 shows the southward march of cooler air in the area



圖一：10月5日下午9時天氣形勢示意圖，藍線代表22°C等溫線，箭咀代表冷鋒後的大致風向。“L”代表低氣壓區的中心。

Figure 1 : Schematic weather situation at 9 p.m. 5 October. The blue line represents the 22°C isotherm. The arrows indicate broadly the wind direction behind the cold front. “L” denotes the centre of the low-pressure area.



圖二：10月5日中午到下午9時22°C等溫線向南擴散的示意圖，下午9時的低壓區中心和冷鋒以灰線符號標記。

Figure 2 : Schematic chart illustrating the southward spread of the 22°C isotherm from noon to 9 p.m. on 5 October. The positions of the centre of the low-pressure area and the cold front are shown in grey.





午9時天氣形勢示意圖，圖二顯示這個時刻之前一段時間珠江口西北方向地區較涼空氣南下的情況。

在冷空氣抵達之前，海高斯殘餘的低氣壓環流裏是較為均勻的熱帶氣團，但是在冷空氣入侵之後，實際上過渡為一個冷暖空氣交錯的溫帶氣旋，這種情況通常發生在較高緯度，例如颱風北上到日本一帶，在香港附近發生是比較少有的。

在轉化過程中，低氣壓環流的能量來源亦同時變化，熱帶氣旋靠下雨時水汽凝結成水點得到所謂「潛熱」，溫帶氣旋則靠冷暖空氣錯位此降彼升從所謂「位能」得到「動能」（這是中學的物理學）。回頭看圖一，海高斯低壓區西面低溫，東面高溫，就是那種釋放位能的格局，因此這個時刻的

north-west of the Pearl River estuary in the period before this time.

Before the intrusion of cool air, the circulation of Higos' remnant consisted of a fairly uniform tropical air mass. However, after that intrusion, it effectively became a temperate depression involving a juxtaposition of cool and warm air masses. Such transformation normally occurs at higher latitudes, such as when typhoons move northwards and get close to Japan. To have it happening near Hong Kong is rare.

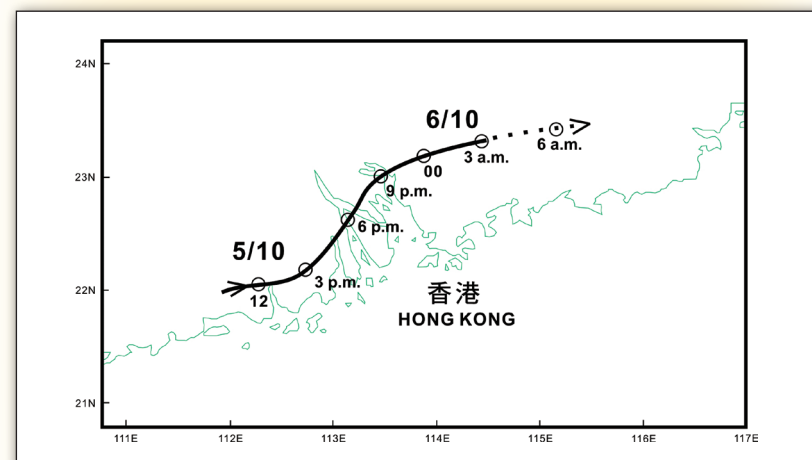
During the transformation, the source of energy sustaining the circulation of the low-pressure area also changed. A tropical cyclone derives its energy from the "latent heat" released when water vapour condenses to form raindrops. On the other hand, a temperate depression gets its energy when cool air sinks and warm air rises in different sectors of its circulation, during which "potential energy" is released to give "kinetic energy". This is in the realm of secondary school physics. Looking at figure 1 again, it was relatively cool to the west and warm to the east of the low-pressure centre of Higos. It is the kind of situation in which potential energy

低氣壓可以歸類為溫帶氣旋，由於得到能量補充，低壓區的環流短暫時間略有增強，這個時候香港錄得較高風速。

圖三顯示海高斯殘餘低氣壓在星期日下午半和星期一上午初期的移動途徑，可以看到位置明顯北抬，跟涼空氣南侵差不多同時發生，從另一個側面反映低氣壓性質的過渡。午

is released. Thus at this moment in time, the low-pressure area may be classified as a temperate depression. With the injection of energy, the circulation strengthened for a short while and higher winds speeds were also recorded in Hong Kong.

Figure 3 shows the path of the remnant low-pressure area of Higos in late Sunday and in the early morning of Monday. It shows an obvious northward shift which took place about the same time as the cool air invaded southward. It is



圖三：10月5日中午至6日上午前期低壓區中心移動示意圖。

Figure 3 : Movement of the centre of the low-pressure area from noon 5 October to the early morning of 6 October





夜之後，低壓區基本上可以看成是冷暖空氣交界上的一個波動，在其後方（即是西面）清涼空氣向南向東擴散，星期一早上大家起床覺得天氣轉涼就是這個原因。

天氣千變萬化，不能一部通書看到老，今次海高斯的轉彎和在香港附近變性為溫帶氣旋就是一個例子。星期日晚上香港風力增強是一次東北季候風疊加在熱帶氣旋殘餘之上造成溫帶氣旋出現及環流能量增加的特例，在秋季發出了強烈季候風信號而香港吹南至西南風確是有點令人覺得奇怪，不過考慮到當時天氣形勢的基本性質，即是季候風誘發生成的溫帶氣旋，也就惟有以季候風信號處理，是一個特例，也為季候風信號開立了一個先例。

海高斯的奇妙故事以熱帶氣旋開始，以90度轉彎為轉

another aspect reflecting the transformation of the nature of the low-pressure area. After midnight, the low-pressure area may be seen as a wave in the interface between the cool and warm air masses. Cool air spread southward and eastward on its rear side, that is, west of the centre. That explains why people noticed cooler weather setting in on Monday morning.

There are endless changes to weather. No single textbook could cover all the possibilities. Higos' abrupt change in direction and its transformation into a temperate depression near Hong Kong constitute a good example. The strengthening of winds in Hong Kong on Sunday arising from the intensification of a temperate depression which in turn came about through the superposition of the northeast monsoon on the remnant of a tropical cyclone is truly a special case. It looked odd to issue the strong monsoon signal in autumn with local winds blowing from the south or southwest. But considering the fundamentals of the weather situation, that is, a temperate depression coming about in the background of the monsoon, the strong monsoon signal was the only rational way of covering the

折，以在香港旁邊變為溫帶氣旋結束，因此香港先有一號風球，後有強烈季候風信號。

我喜愛氣象，正因為天氣變幻莫測，層出不窮。

林超英  
2008年10月9日

event. It was a special case. It also would be a precedent case for the future.

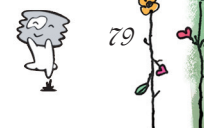
The amazing story of Higos commenced with it being a tropical cyclone. The 90-degree turn changed its fate, leading eventually to its transformation into a temperate depression near Hong Kong. That was why we first had a number 1 tropical cyclone signal and later had the strong monsoon signal.

I love meteorology because weather is forever changing. What's more, you never know what is coming next.

C Y Lam  
9 October 2008

給嚴肅氣象迷的附言 : 以上分析在短時間內以手上有限資料完成，目的在概述氣象變化的重點，圖一至三屬於示意圖性質，請不要執著這裏差幾公里，那裏差一度的細節，這些屬於將來研究人員的精細工作。

P.S. for serious weather fans : The above analysis was completed in very short time with limited data in hand. The purpose is to highlight the key aspects of the meteorological event. Figures 1 to 3 are schematic diagrams only. Please don't quibble about differences of a few kilometres here or a degree or so there. Such things belong to the work of future researchers with time to look into details.







## 理性、歷史

### *Rationalism and history*

有朋友問：為甚麼網誌文章相隔時間很長？答案是：九月下旬我放了假，在中亞的烏茲別克旅遊了兩個星期，而且天文台台長的工作有時真的很忙，寫網誌文章說到底是所謂「邊緣工作」。

People ask me why the blog articles have been rather infrequent. The answer is that I took leave in the second half of September and spent two weeks travelling in Uzbekistan in Central Asia. Furthermore, the Director of the Hong Kong Observatory could be rather busy from time to time, and writing blog articles is in the final analysis a task in the periphery.



九月的旅遊重點在歷史名城撒馬爾罕，它是絲綢之路上的樞紐，歐洲歷史上視為東方之珠，我則覺得它相當於中亞的香港，大家共通之處甚多，如自然資源缺乏，繁榮建築在信息和貨物流通之上等。

作為科學家，最令我感動的是來到六百年前由帖木兒汗國第三代君主Ulug Beg建立的天文台遺址，懷念他對知識的追求，他說過：「王國會消亡，科學家的工作成果則永久長存。」Ulug Beg雖是君主，但是尊重理性討論，與當時的貴族和宗教狂熱者很不一樣，他登基後不久便被殺害，他建立的天文台是當代最偉大的天文台，亦被反智的統治者徹底摧毀，但是正如他的預言，帖木兒汗國灰飛煙滅五百年後，德智俱備的Ulug Beg卻因他的科學成就名留青史。

The focus of the September trip was the historical city of Samarkand. It was a major node in the Silk Road and was long seen by the Europeans as the Pearl of the Orient. To me, Samarkand is the Hong Kong of Central Asia. The two cities share much in common such as the lack of natural resources and the dependence of prosperity on the flow of information and goods.

As a scientist, the high point in the trip was the visit to the remains of the great observatory built 600 years ago by Ulug Beg, the third ruler of the Timur Empire. There I stood in silence paying respect to a great man keen for knowledge. Ulug Beg said, "Kingdoms vanish, but the work of scientist persists forever." Although Ulug Beg was a ruler, he respected rational discussions, in stark contrast with the aristocracy and over-zealous religious people of his time. He was killed soon after becoming ruler. His observatory, then the greatest of the world, was razed to the ground by the anti-knowledge ruling class. But as he predicted, 500 years after the Timur Empire vanished, the wise Ulug Beg is still being remembered for the great





在歷史這面鏡子中，我看到知識和理性是人類文化的重要部份。我經常提醒自己和天文台的同事，在執行公務時必須堅守科學和理性，離開這個基礎，我們沒有立足之處。

進入十六世紀後，撒馬爾罕從繁榮的巔峰下滑，輝煌的建築很快變成頹垣敗瓦，原因是由於往來中國和歐洲的海路開通，陸上絲綢之路失去重要性，沒有貿易物流，繁榮無以為繼。今天的世界起著根本的轉變，香港面對近似撒馬爾罕當年碰上的問題。這些事情超出天文台的範疇，不過作為一個普通市民，我不能不用心思考。

從大局回到微觀，就天文台自身的工作而言，我們必須注意社會的轉變，不斷調整回應，才能確保機構存在的價值。偶然還有一些同事希望最

scientific work he did.

Through the mirror of history, I could see that knowledge and rationalism constitute important components of human culture. I always remind myself and my Observatory colleagues that we must stick to science and rationalism when delivering public service. Should we deviate from this foundation, we would have nowhere to stand on.

The 16th century marked the start of the decline of Samarkand from the peak of its prosperity. The magnificent buildings decayed into rubbles rapidly. The decline was due to the establishment of the sea route between China and Europe, which led to the disuse of the Silk Road. Without trade, prosperity had nothing to feed on. Nowadays, the world is going through drastic changes and Hong Kong is facing similar fundamental problems. Such things are outside the purview of the Observatory. But as a common citizen I could not resist contemplating what the implications are for Hong Kong.

Back to the microcosm of the Observatory, all the time we have to take cognizance of changes in the world and adjust the way we conduct business



好甚麼都不要變，可惜時間是不會停下來。

林超英

2008年10月30日

in response. Only by doing so would we ensure that the department deserves being kept alive. Occasionally, a couple of colleagues still wish that everything would remain unchanged. Unfortunately, time stops for nobody.

C Y Lam

30 October 2008



圖一：在偉大的天文台遺址懷念Ulug Beg，地下空間保存了部份帶有刻度的圓弧。

Figure 1 : Paying respect to Ulugh Beg at the site of his great observatory.

A segment of the graduated arc is preserved underground.







## 秋天裏的春天

### *Spring in autumn*

上星期六我去游泳，沒想到已經是十一月。沿途見到樹木長出嫩葉，喜鵲含著小枝築巢，珠頸斑鳩興奮地求偶，一片春天景象，但是時序實在是秋天，生物世界被氣候轉變弄糊塗了。

Last Saturday, I went to swim without thinking that it was already November. On the way to the pool, I saw trees sprouting new leaves, magpies carrying twigs to build nests and spotted doves in feverish courtship rituals. It was every bit like spring. But it was autumn. The biological world has been fooled by the changing climate.



根據天文台發出的新聞稿 (<http://www.weather.gov.hk/wxinfo/news/2008/pre1101c.htm>)，2008年10月是1884年有紀錄以來最暖的十月，令人注目的是紀錄中最暖的十個十月有五個出現在最近十年。即是說，最近十年入圍「最暖十月」的概率是50%，相對於全部124年的平均概率10/124（約8%），差距達40%之譜，說是隨機碰巧出現實在不太可能。

科學地說，我們不能隨便指任何一個較暖的月份「源於氣候變化」，因為在自然界年與年之間總是有些起伏。但是面對上面展示的統計數字，我們再沒有甚麼餘地懷疑十月的天氣在以十年計的時間尺度中愈來愈暖，我們不得不相信氣候真的變了。

藉此機會，我想澄清某些標題為「N年後沒有冬天」的新聞報導。我見過最少的「N」

According to the press release (<http://www.weather.gov.hk/wxinfo/news/2008/pre1101e.htm>) issued by the Hong Kong Observatory (HKO), October 2008 was the hottest month of October since records began in 1884. What strikes me most is that out of the ten hottest months of October on record, five occurred in the last decade. The probability of getting it “hot” is 50% in the last decade. The overall probability over the 124-year period is 10/124, which equals about 8%. The difference of some 40% is most unlikely to be due to random chance.

Scientifically, we cannot attribute any particular hot month to “climate change” because year-to-year fluctuations do occur naturally. But with statistical data like that shown above, it leaves little doubt that October has become warmer over the decades and that the climate has indeed changed.

I take the opportunity to clarify certain press reports carrying the title of “no winter in n years”. The smallest value of “n” I have seen in newspaper is “12”. What the HKO has said in its





是「12」。天文台最後一次談到這個題目的新聞稿 (<http://www.weather.gov.hk/wxinfo/news/2008/pre0312c.htm>) 是這樣說的：「多個情景一起計算的平均結果顯示，在2030年至2039年每年寒冷天數將下降到一天以下，即是有些冬天再無寒冷日子。如果採用高排放情景加上持續城市化速率，無冬天的時段預計於2020年到2029年出現。」

文中提到一個處境，在某些十年時段裏每年平均寒冷天數跌低於1，從算術引申的結果是：十年之中最少有一年的寒冷天數是0，在普通人的語言來說就是沒有冬天。十年之中仍然有些年份有冬天，不過偶然有些年份不見寒冬。我們所說的「沒有冬天」是這個意思。

在新聞稿中，天文台指出，最壞的情景是人類繼續大量燃燒煤與石油和香港城市化

last press release on the subject (<http://www.weather.gov.hk/wxinfo/news/2008/pre0312e.htm>) was : “The average of all calculation results based on different scenarios shows that by 2030-2039, there will be less than one cold day a year, meaning that for some winters, there will not be any cold days at all. For the situation in which the high emission scenario is coupled with continued urbanisation, the time for this to occur will be advanced to 2020-2029.”

It refers to a situation in which the average number of cold days per year in a certain decade drops below 1. In that case, at least one of the years in that decade would have 0 cold days according to arithmetic. That would be a year “with no winter” in layman terms. There will continue to be years with winter, only that from time to time, winter would be skipped. That is what we really mean.

In the press release, HKO says that in the worst scenario, skipped winters would start appearing in the decade 2020 – 2029. One of the reporters took the earliest year 2020 and subtracted 2008 from it to get

持續，不見寒冬的年份出現於2020至2029十年之間，記者採納了最早的2020，減去2008得出12，這是「12年後沒有冬天」標題的來龍去脈。

「12年後沒有冬天」，或許有點誇張，但是就算是22年也是值得大家警惕的，因為大多數人會活到這個年份。過去我們說要為子孫保護地球，但是現在氣候變化加快，假如我們不立即採取行動加以遏止，吃苦的是我們自己。

我不是嚇人的悲觀主義者，我祇是一個老實的氣象人，閱讀著眼前的數據，並為生命世界包括人類的前途擔心。這是我不斷談氣候變化的原因。

林超英

2008年11月6日

12, thus the title “no winter in 12 years”.

“No winter in 12 years” might be somewhat exaggerated. But even if it is 22 years, it would be alarming enough because it would be within the life-time of many of us. In the past, we talk about preserving the Earth for our children and grand-children. Now we could see the boomerang hitting ourselves if we do not act quickly to arrest the accelerating climate change.

I am not an alarmist. I am just an honest meteorologist reading the available data in front of me and getting concerned about the destiny of the living world, including human beings. That is why I talk about climate change all the time.

C Y Lam

6 November 2008







## 秋天裏的春天 (二)

### *Spring in autumn 2*

上次提到秋天裏樹木長出嫩葉，三星期過去了，不合時令的植物現象愈看愈多，以下再舉兩個例子。

窩打老道九龍塘一段，瑪利諾修院學校山坡的杜鵑叢裏開了幾朵花，附近另外有一棵

Three weeks have elapsed since I last talked about trees sprouting new leaves in autumn. I have encountered even more unseasonable plant phenomena. Two examples are discussed below.

In the Kowloon Tong segment of Waterloo Road, I noticed flowers in the clusters of azalea growing on the slopes

鳳凰木開了鮮紅的大花，四周伴有嫩綠的新葉。昨天晚上聽我講課的同學告訴我，香港其他地方也有同樣的現象。

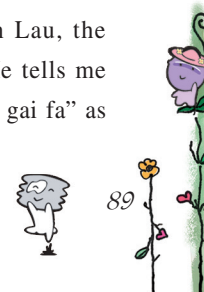
四十年前我唸香港大學時，杜鵑花在校內有一個「騰雞花」的外號，廣東話「騰雞」是害怕得發抖的意思，因為考試在五月，杜鵑通常三、四月盛放，看到開花就是考試快到，大家要勤力讀書了。十多年來，我在香港天文台的範圍裏，見到杜鵑花開花的日子不斷提前，最近兩三年，十一月也見到開花。今年有朋友告訴我，十月底在九龍塘也見到了，這是一個十分震撼的現象。

至於鳳凰木，我向hktree.com網主Leon Lau請教，他說鳳凰木也有「騰雞花」的別號，通常五、六月開花，我想是中學同學的讀書信號，今年5月22日我的一篇網誌文章

of Maryknoll Convent School. Bright red flowers were also observed amid fresh green leaves on a nearby Flame of the Forest tree. Students attending my evening lecture yesterday told me that they were seeing similar phenomena elsewhere in Hong Kong.

When I studied at the University of Hong Kong some 40 years ago, azalea was nicknamed “tun gai fa” in Cantonese. “Tun gai” means “trembling in fear” and “fa” means flower. It was because azalea typically blossomed in March and April, shortly ahead of the examinations in May. Seeing azalea flowers meant that examinations were just round the corner and that it was time to study hard. In the last decade or so, I noticed that azalea in the Observatory grounds started flowering earlier year after year. In the last couple of years, flowers were seen in November. This year a friend told me that azalea flowers were seen in Kowloon Tong as early as late October. This is shocking news.

In the case of the Flame of the Forest tree, I have consulted Leon Lau, the webmaster of hktree.com. He tells me that the tree also carries “tun gai fa” as





剛好展示了天文台園地內鳳凰木盛開的美麗景象。如今十一月底竟然有鳳凰木長出嫩葉與新花，相差剛好半年，季節顛倒，無以復加。昨天一位同學告訴我，這個現象她已經見了三年。

在全球暖化的背景下，世界各地都有春天植物提早開花的報告，但是早到穿過冬季進入秋天卻是從未聽過的事（如果讀者看過有類似報告的文獻請不吝指教），到了目前這個地步，已經分不開是早了半年還是晚了半年！

正如我的一位同事所說，植物最老實，不會說謊。成長全看天時地利，溫度、雨水和陽光一天一天地影響著植物，時機成熟便會長葉、開花、結果。香港植物目前開花亂了時序，反映氣候變化嚴重衝擊自然生態千萬年來形成的平衡，生活跟植物有緊密關係的鳥

its nickname and that it usually flowers in May and June. I guess that it serves to prompt secondary school students to study for examinations. It so happened that I mentioned about the beautiful sight of the blossoming Flame of the Forest tree in the Observatory in my blog article dated 22nd May. Now fresh leaves and new flowers are seen on such trees at the end of November. The reversal of seasons could not be worse than this. One of the students yesterday told me that she had seen this phenomenon for three years already.

In the context of global warming, the early flowering of plants has been reported in many parts of the world. However, I have yet to see reports of early flowering date migrating past winter and transiting into autumn. (If any reader is aware of such reports, please kindly let me know.) In the present situation, we could no longer tell whether it is flowering too early or too late by half a year!

As one of my colleagues has said, plants are honest and don't tell lies. They grow as circumstances dictate, reacting to temperature, rain and sunshine which incessantly work on them. They sprout leaves, blossom or bear fruits when the

類、昆蟲、微生物全都受到影響。大家須知，稻米、大麥、小麥也是植物，也是自然生態的一個部份，因此氣候變化會影響糧食生產，居住在大都會的我們不能逃避將來出現糧食短缺的難題，今年的白米漲價也許可以看成是一個小小提示。

不看日曆，秋天裏的春天或者是一種浪漫。但是日曆裏明明寫著立冬和小雪已經過去了，此時此刻杜鵑和鳳凰木開花，在我是觸目驚心。難道自然界已經把季節忘掉了嗎？

林超英  
2008年11月26日

time comes. That plants have flowers out of the proper season in Hong Kong reflects that climate change has seriously disrupted the delicate balance in nature which has taken millions of years to establish. Birds, insects and microorganisms the lives of which are intricately entwined with those of plants will all suffer from this disruption. We should realize that rice, wheat and barley are also plants, and are part of nature. Food production could be affected by climate change and city folks like us could not avoid the issue of food shortage in the future. The sharp rise in the price of rice earlier this year may perhaps be taken as the harbinger of things to come.

Forgetting about the date, spring in autumn could be a romantic experience. However, the calendar clearly states that the two Chinese solar terms viz. Winter Commences and Light Snow have passed. Seeing the flowers of azalea and the Flame of the Forest tree at this time of the year sends shivers down my back. Has nature lost its sense of the seasons?

C Y Lam  
26 November 2008







## 天上的笑臉 *Heavenly smile*

2008年12月1日出現了一個頗有趣的天象，那天日落時分望向西南方，居然見到一張可愛笑臉懸在半空！原來，當時金星和木星在天球上走到一個頗為接近的位置，碰巧下方也跑來一道娥眉彎月，結果就形

An interesting astronomical phenomenon took place on 1 December. Looking towards the south-west at sunset time, one could see a smiling face in the sky. Venus and Jupiter got rather close to each other and the crescent moon happened to be located underneath them. Together they formed a smiling face

成了一個天上的笑臉符號☺，彷彿老天爺也來為我們打氣，提醒我們做人不用太過悲觀，世上快樂的事還有許多許多。

我的同事在天文台總部的天台拍下了幾十張照片，並選取了一張效果最好的與大家分享（見圖）。說起觀星，天文台的地理環境起了很大變化，本來天文台建在尖沙咀的一個小山丘上，視野廣闊，可以看到維多利亞港，但是幾十年下來四周多了不少高樓大廈，這次星月下沉的路徑就被擋去一大片。另外，市區的強光也令拍攝倍添困難，哈哈笑臉出現沒多久就受霓虹招牌泛出來的光暈影響，視覺效果沒有那麼黑白分明，這就是天文愛好者所說的「光害」。

世事常有正反兩面。在真正漆黑的夜空，繁星萬千，初學觀星者會感到完全的迷失。在城市裏，光害淹沒了較暗的

like ☺, as if someone was sending us a message to boost our morale, reminding us that we should avoid being unduly pessimistic and should remember that the world is full of happy happenings.

My colleagues at the Observatory headquarters took many photographs and I show one below. In terms of star-gazing, the surrounding landscape at the Observatory has changed dramatically. The Observatory was originally built on top of a knoll in Tsimshatsui with a good panoramic view of the Victoria Harbour. But in the past few decades, tall buildings have surrounded the site. They blocked the view of the “smiling face” well before it reached the horizon. Furthermore, the bright lights of the urban areas were a nuisance to star photography. Stray light from neon advertisement signs overwhelmed the light of stars, so that the “smiling face” lost its visual impact shortly after it appeared in dim light. This is what astronomers refer to as “light pollution”.

Every coin has two sides. In the really dark sky, there are so many stars that beginner star-gazers would be confused and become completely disoriented.





星辰，天上祇餘下疏落幾顆最亮的恆星和行星（例如今次的金星和木星），對於初學觀星的朋友，反而是學習辨認星座的好機會。

樂觀看世界，迷濛使人抓緊前進的方向，困難給人發揮表現的機會，星月無情也讓人見到上天的笑臉。我鼓勵大家凡事多看正面，讓開心的感覺進入我們的生活之中。

林超英  
2008年12月4日

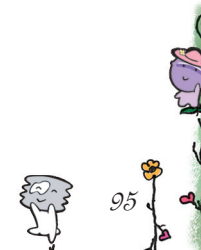
On the other hand, in cities where the not so bright stars are drowned by light pollution, only the brightest stars and planets (such as Venus and Jupiter in the present case) would remain. In a counter-intuitive way, it would actually make the identification of star constellations much easier for beginner star-gazers.

We could choose to look at the world through the glass of optimism. Then we would notice that poor visibility makes us focus firmly on the direction of our movement. Adversity would give us the opportunity to deliver our best. We could even see a heavenly smile in the sky despite the planets and the moon being inanimate objects. I sincerely encourage everybody to see the positive side of things, so as to let joy become part of our everyday life.

C Y Lam  
4 December 2008



圖一：在天文台百週年紀念大樓天台拍得的照片，  
左上方是金星，右上方是木星，下面則是月亮。（天文台同事林堅銳先生攝）  
Figure 1 : Photograph taken on the rooftop of the Centenary Building of the Hong Kong Observatory.  
Venus is on the left-hand side and Jupiter on the right-hand side. The moon is situated at the bottom.  
(Taken by Observatory colleague Mr Lam Kin-yui )







# 2008 · 氣候變化

## 2008 climate change

2008年香港的氣候概括地說是「冷頭熱尾」。

一、二月之間，連續24天天氣寒冷<sup>①</sup>，是四十年來最長的寒潮。接近年底，九、十、十一月三個月反過來成為百多年來最暖的秋天<sup>②</sup>。總計全年平

Broadly speaking, Hong Kong started cold and ended warm in 2008.

It was cold<sup>①</sup> for 24 consecutive days between January and February, making it the longest cold spell in 40 years. In contrast, towards the end of the year, September-November turned out to be the warmest autumn in more than a century<sup>②</sup>. Taken overall, the annual mean

均氣溫<sup>③</sup>，位列1884年有紀錄以來最高第二十名。補充一點，年初的寒潮雖然長，但是期間的最低氣溫7.9攝氏度，跟數十年前的冬天比較，相對仍是偏高。

至於全球的情況，世界氣象組織秘書長指出<sup>④</sup>：2008年預計是1850年有儀器紀錄以來全球第十溫暖的年份，今年比過去數年稍涼，主因是年初「拉尼娜」的影響，即是赤道太平洋東部海水偏冷。他又特別提到：北冰洋夏季海冰的覆蓋面積是1979年有人造衛星觀察以來第二最低，印證三十年來持續下降的趨勢，從另一角度反映了全球變暖的嚴重性。可以說，不論香港或是全球，2008年的情況跟氣候變暖的大趨勢是吻合的。

我自己曾經是氣候變化的懷疑者，不相信人類有能力影

temperature<sup>③</sup> ranks the 20th highest since records began in 1884. I should remark that, while the cold spell was long, the lowest temperature recorded during the period viz. 7.9°C was on the high side compared with the winters of decades ago.

At the global level, the Secretary-General of the World Meteorological Organization expected that 2008 would be the 10th warmest year globally since instrumental records began in 1850<sup>④</sup>. This year is slightly cooler than the last few years mostly due to the La Niña phenomenon at the beginning of the year. La Niña is said to occur when the sea-surface temperature in the eastern part of the equatorial Pacific is below normal. The Secretary-General also highlighted the fact that the summer sea ice coverage in the Arctic Ocean was the second lowest since satellite monitoring began in 1979. This reinforces the continuing falling trend in the last three decades, which reflects the seriousness of global warming. The conditions in 2008, both in Hong Kong and globally, are consistent with the broad global warming trend.

I was myself a doubter of climate change. I did not believe that human





響全球氣候，不過到了2002年，看到聯合國氣候變化專門委員會（IPCC）發表的第三次評估報告內，面對大量的數據和論述，我不得不接受人類造成氣候變化的事實，後來再讀了2007年IPCC發表的第四次評估報告，更感事態嚴重，確認人類必須醒覺和迅速行動。

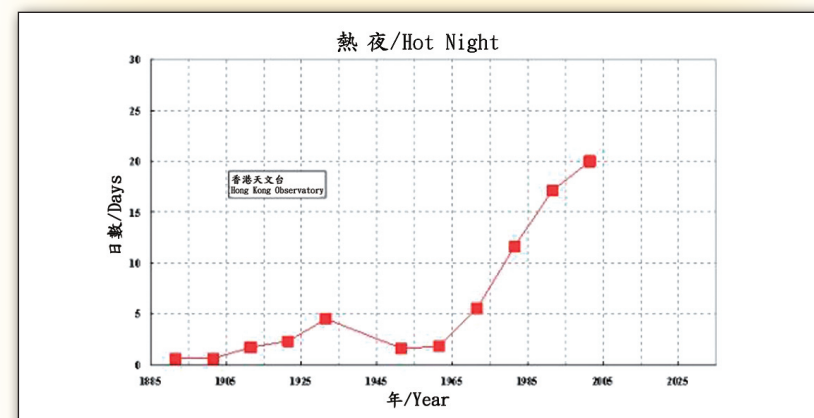
由於我曾經是懷疑者，因此某程度上我能夠理解為何仍然有人不相信氣候變化，主要原因是他們沒有接觸到關鍵的數據，或者沒有碰上一些個人特別有感應的現象。就此我謹提供一個角度給大家感受香港氣候變暖的情況，圖一顯示過去百多年每十年計算一次的平均每年熱夜<sup>⑤</sup>天數。

上世紀六十年代之前，香港熱夜不多，在我的少年時期，「天階夜色涼如水」真有其事，天氣炎熱時晚上祇要跑

beings could cause the global climate to change. However, in 2002 I got hold of a copy of the Third Assessment Report of the UN Inter-governmental Panel on Climate Change (IPCC). I found in that report data and arguments so convincing that it was no longer defensible to refute that proposition. After reading the 4th Assessment Report issued by IPCC in 2007, I realize further that we are facing a problem of great seriousness and human beings must wake up and take actions immediately.

Because I was a doubter, I could understand to some extent why some people still do not believe in climate change. It is because they have not had the opportunity to read key data or because they have not encountered any weather phenomenon which has resonance with their personal experience. Here, I present a perspective which hopefully would help people in this category to appreciate the warming trend in Hong Kong. Figure 1 shows the average annual number of hot nights<sup>⑤</sup> computed for different decades over the last century or so.

Before the sixties of the last century, there were few hot nights. When I was a



圖一：香港熱夜天數的變化  
Figure 1: Variation in the annual number of hot nights in Hong Kong

到天台或街上睡就可以了。六十年代之後，熱夜急增，變成熱得沒處躲。從這張圖看，香港變暖的趨勢是十分明顯的。當然，有必要說明，香港變暖，包含了全球變暖及香港本身城市化兩個重疊的因素。

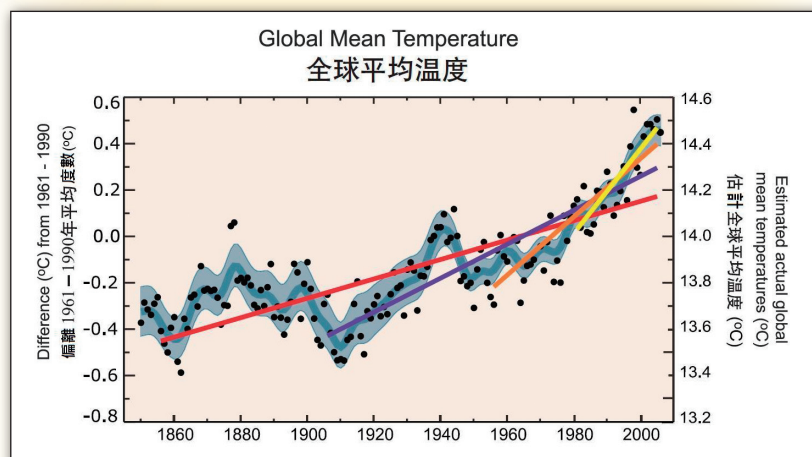
全球變暖方面，IPCC有一張圖，很能說明情況，我謹引用如下：

kid, all that one had to do on hot nights would be to go and sleep on the rooftop or out in the street. After the sixties, hot nights became much more frequent. Now there is no escape from the heat even at night. I hasten to add that the warming in Hong Kong has arisen from two overlapping factors viz. global warming and local urbanization.

On global warming, IPCC has a very nice figure illustrating the situation. It is shown below:







圖二：過去一百多年全球氣溫變化（來源：IPCC第四次評估報告）

Figure 2: Variation in global temperature in the past centuries (Source: 4th Assessment Report, IPCC)

不同顏色的直線線段，代表不同時期的氣溫上升趨勢，愈是近代，升勢愈急，表示暖化步伐加快，這是全球氣象學家憂心如焚的根本原因。經過眾多科學家的多年研究和分析，人類燃燒煤和石油，排放大量二氧化碳，造成氣候變化和全球變暖，已是不爭事實。繼續埋首沙堆，不肯面對，拒絕行動，會讓情況惡化到危害

Line segments in different colours portray the warming trends over different periods. The rise is increasingly steep as we approach more recent times. This is why meteorologists get very worried. The studies by many scientists over many years have established beyond reasonable doubt that climate change and global warming are caused by the large amount of carbon dioxide emitted by human beings through the burning of coal and petroleum. Burying our heads in sand, refusing to look at the facts and postponing actions would lead to

自身生存的地步，再不是我們的選擇。

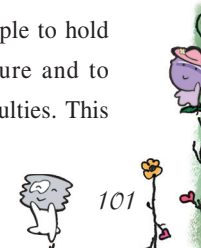
2009年即將來臨，我誠心願望，地球人類勇敢地承擔責任，所有人都在能力所及範圍內，減少消耗能量以求降低排放二氧化碳。這樣地球才有機會休養生息和維持天地萬物永續生存，這樣人類的前途才有保障。

加一點題外話：昨天在有線電視新聞節目裏我講了一句話：「後天會更好。」一些朋友有點疑惑，在此略作說明。本月初我聽了中國企業家馬雲先生的一場演講，他說：「今天很艱難，明天更艱難，後天很美好，大多數人在明天放棄。」大意是做事必須情繫未來的美好，面對艱難時最緊要堅持。我在天文台工作一向採取的態度大概就是這樣，聽馬雲先生說了頗有觸動，因此在

conditions threatening the survival of human beings. That is no longer a viable choice.

As 2009 nears, I sincerely wish that human beings on Earth would be bold enough to pick up the responsibility of rectifying the problems. I hope that all would do whatever is within their capability to reduce energy consumption so as to reduce carbon dioxide emission. That way the Earth would have a chance to repair itself and to continue supporting the living world. Only then would our future be assured.

As a digression, I take the opportunity to explain what I meant when I said "Things would turn out better the day after tomorrow" (the original was in Chinese) in the news programme of Cable TV yesterday. Some people were puzzled. I attended a lecture by well-known Chinese entrepreneur Mr Ma Yun earlier in the month. He said, "Today is difficult. Tomorrow will be even more difficult. The day after tomorrow will be beautiful. Most people give up tomorrow." He was, I think, encouraging people to hold onto the passion for the future and to persevere in the face of difficulties. This





訪問中做他的講法說了「後天會更好」，與大家共勉，希望我們一起努力，為香港美好的未來作出貢獻。

林超英

2008年12月30日

is broadly what has sustained me at the Observatory, and so I was particularly moved on hearing Mr Ma talking about it. Therefore, during the interview I could not resist imitating Mr Ma and said, "Things would turn out better the day after tomorrow". I sincerely hope that we would all work hard together and contribute our efforts in building a better Hong Kong for its people.

C Y Lam

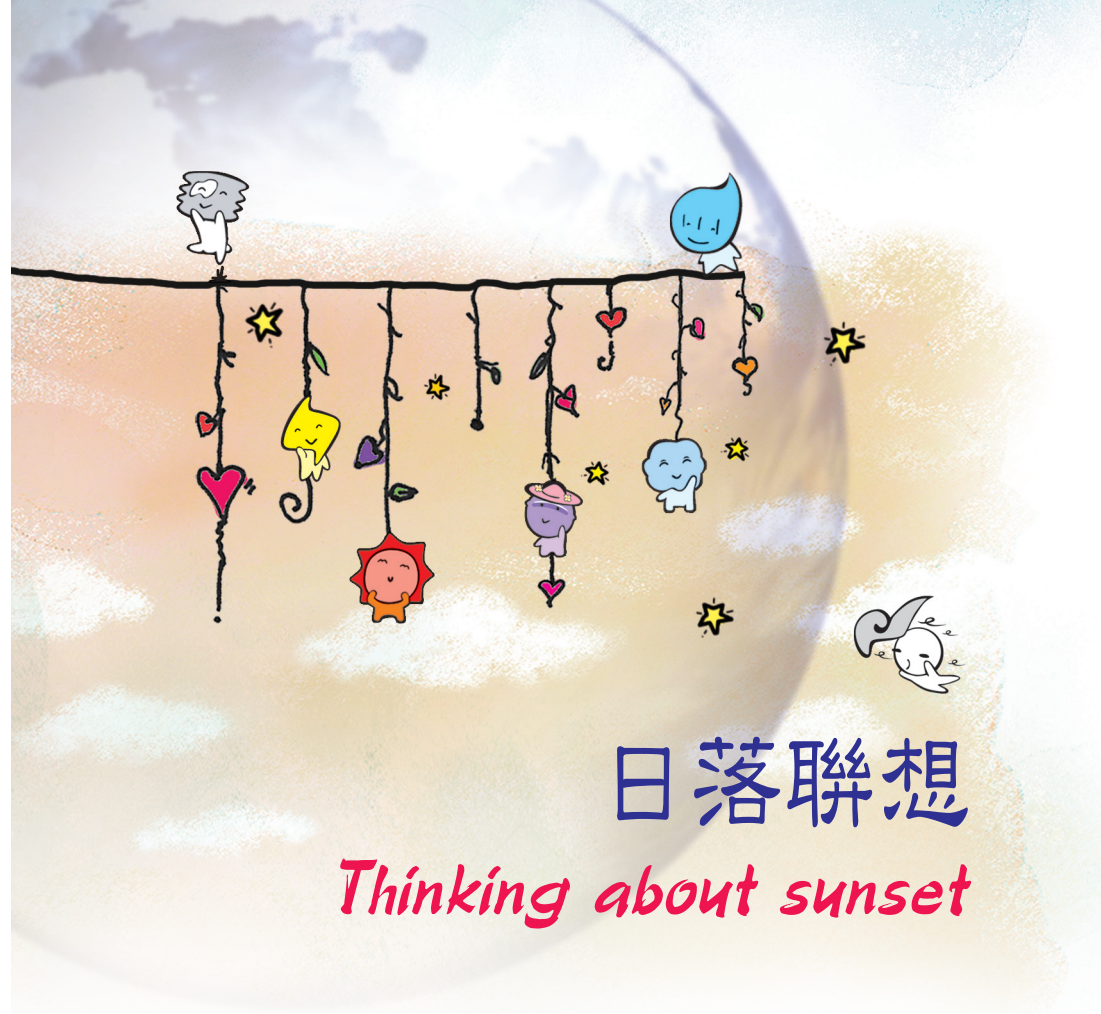
30 December 2008

註解：

- ① 以天文台日最低氣溫低於12.0攝氏度為指標。
- ② 年平均氣溫與2005年同列1884年以來第一最高。
- ③ 至12月29日為止。
- ④ 2008年12月16日世界氣象組織新聞稿 [http://www.wmo.int/pages/mediacentre/press\\_releases/pr\\_835\\_en.html](http://www.wmo.int/pages/mediacentre/press_releases/pr_835_en.html)
- ⑤ 以天文台日最低氣溫高於28.0攝氏度為指標。

Notes:

- ① criterion: daily minimum temperature at the Observatory lower than 12.0°C.
- ② annual mean temperature same as 2005, both being the highest since 1884.
- ③ up to 29 December.
- ④ WMO press release dated 16 December 2008 - [http://www.wmo.int/pages/mediacentre/press\\_releases/pr\\_835\\_en.html](http://www.wmo.int/pages/mediacentre/press_releases/pr_835_en.html)
- ⑤ daily minimum temperature higher than 28.0°C.

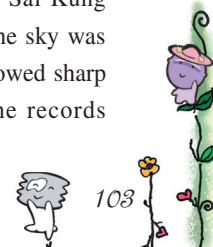


1月1日黃昏朋友送來短信，告訴我看見日落時的太陽又大又亮，問我是否出現了特別的天文現象。

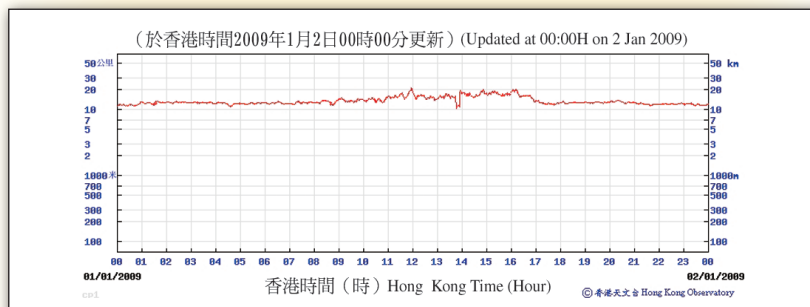
當天我在西貢郊野公園漫步，留意到天空蔚藍，遠山輪廓分明。根據香港天文台位於

In the evening of 1 January, a friend sent me an SMS, telling me that he saw a sun "big and bright" during sunset. He asked me whether there had been any special astronomical phenomenon.

That day I had a hike in Sai Kung Country Park. I noticed that the sky was azure blue and distant hills showed sharp silhouettes. According to the records







圖一：1月1日維多利亞港儀器測得能見度  
Figure 1: Instrument-measured visibility in the Victoria Harbour on 1 January 2009

中環海旁的能見度儀器的紀錄（圖一），1月1日維多利亞港的能見度整日都超過10公里。（每天的即時資料可到以下網址找 [http://www.weather.gov.hk/wxinfo/ts/display\\_element\\_vis\\_c.htm#cp1](http://www.weather.gov.hk/wxinfo/ts/display_element_vis_c.htm#cp1)。）

由於能見度良好，太陽沒入地平線前，沒有受到太多空氣中懸浮粒子的遮擋，讓我們清清楚楚地見到它的本來面目，因此顯得特別光亮，又由於靠近地平線時，太陽的大小有了山嶺參照，通常令人覺得

of the Observatory's visibility meter at the waterfront in Central (figure 1), the visibility in the Victoria Harbour exceeded 10 kilometres throughout that day. (For real-time visibility data everyday, you may visit [http://www.weather.gov.hk/wxinfo/ts/display\\_element\\_vis\\_e.htm#cp1](http://www.weather.gov.hk/wxinfo/ts/display_element_vis_e.htm#cp1))

Because of the good visibility, as the sun was about to set below the horizon, its light beams reached the observer's eyes without being blocked by too many suspended particulates in the air. Thus the sun's bright disk was seen as it should be. Furthermore, as the sun neared the horizon, the hills provided a spatial reference for size. This tends to make people feel that the sun is bigger, compared with a sun high up in the sky with no sense of scale. So

比懸在半空時大得多。朋友看到大而亮的太陽，其實祇是一次正常的日落。

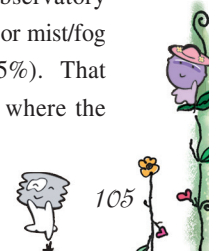
但是為甚麼他有此一問？我想原因是過去多年，黃昏日落時太陽往往尚未接近地平線已經糊裡糊塗地隱沒在大氣低層厚厚的懸浮粒子後面，白天至黑夜是一個沒有清晰分界的過程，所謂「日落」變成一個很模糊的概念，有些人如我的朋友連真正的日落，即是太陽在不受遮擋的情況下轟轟烈烈地沒入地平線的影像都忘記了。

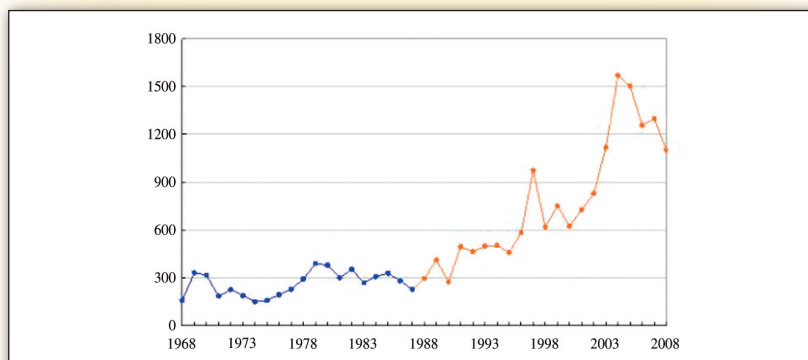
香港的空氣變得愈來愈迷濛是一個為時二十年左右的過程，1997年天文台首次就此發出新聞稿，但是沒有惹起太多人的注意<sup>①</sup>。最近幾年情況急劇轉變才成為熱門話題。圖二展示過去四十年天文台總部每年出現與雨、霧及高相對濕度（ $\geq 95\%$ ）無關的低能見度總時

while my friend thought that he had seen a sun particularly “big and bright”, it was just an ordinary sunset.

But then why did he think that it might be a special astronomical phenomenon? I believe that it is because ordinary sunset is becoming a rare sight. In recent years, the sun often disappears gradually behind a thick curtain of suspended particulates in the lower atmosphere at evening time long before it reaches the horizon. Day and night are no longer separated by a sharp line. “Sunset” is just a fuzzy concept. Some people including my friend have forgotten how real sunset looks like. To me, “sunset” carries the image of the sun forcefully making its way into the horizon, seen through clear pristine air.

The air in Hong Kong has become increasingly turbid over a period of some twenty years. In 1997, the Observatory issued for the first time a press release about the subject but it did not catch the eye of too many people<sup>①</sup>. It has become a hot topic only after the rapid deterioration in more recent years. Figure 2 shows the trend in the annual total number of hours of reduced visibility at the Observatory headquarters not related to rain or mist/fog or high relative humidity ( $\geq 95\%$ ). That is, it refers only to situations where the





圖二：香港天文台總部1968至2008年期間能見度低於8公里的年總時數  
(霧、薄霧、雨及相對濕度在95%或以上不計)

Figure 2: Annual total number of hours with visibility at the Hong Kong Observatory Headquarters below 8 km from 1968 to 2008 (relative humidity below 95 % and not counting rain, mist or fog)

數的趨勢，即是基本上是空氣中懸浮粒子引致視野模糊的情況，在這項研究裏低能見度以8公里為指標。

前二十年（1968-1987）的低能見度時數大概每年300小時左右，有些起伏但上升趨勢輕微。後二十年卻發生了明顯變化，出現大幅度上升，1998年前後的低能見度時數倍增至超越600小時，不出十年，還未到2008年，又再倍增至超越1200小時。視野迷濛的日子增加得這麼快，難怪普羅市民都有所

reduction in visibility is due to suspended particulates in the air. In this study, a threshold value of 8 km is used to define low visibility.

In the first twenty years (1968-1987), there were about 300 hours of low visibility each year. The numbers fluctuated somewhat but the overall upward trend was slight. An obvious change took place in the last twenty years, with a major upward swing. By 1998, the annual number of hours of low visibility doubled and exceeded 600. In less than ten years and before reaching 2008, it doubled again, going beyond 1,200 hours. Hazy days increased in number so rapidly that it could not possibly escape people's notice. It led to people expressing concern.

感應和表示關注。

時至今天，正常的日落由於少見變成「疑似特殊天文現象」，空氣迷濛恐怕已到了一個我們必須正視和反思的時刻。天空為甚麼會愈趨迷濛？人類社會有份造成嗎？近二十年究竟發生了甚麼事？我們可以做些甚麼去遏止情況惡化？

最後，我請大家思考：人生看不到日落重要嗎？

Nowadays, normal sunset is so rarely seen that it has ended up being mistaken by people as a "special astronomical phenomenon". I am afraid the turbidity of our air has reached a point where we must look it in the face and wonder what has gone wrong. Why is the sky increasingly turbid? Are human beings responsible? What has happened in the last twenty years? What could we do to stop further deterioration?

Finally, I invite you to think about this: is it important in life to be able to see real sunset?

林超英  
2009年1月8日

C Y Lam  
8 January 2009







## 羲和・授時

### *Xi He and Shou Shi (Time Service)*

年初三，新年假期最後一天，香港天文台範圍內十分寧靜，隨手取出閒置書架多時的《尚書》翻看，其中《堯典》一篇說堯帝安定天下後辦的第一件事是：「乃命羲和，欽若昊天，歷象日月星辰，敬授人

On the third day of the Chinese New Year, the last day of the holidays, all was quiet in the grounds of the Hong Kong Observatory (HKO). I picked up by chance the ancient Chinese book Shang Shu which had been lying idle on the book rack for quite some time. Flipping through the pages, I came to the chapter Yao Dian. It says that the first thing Emperor Yao did on achieving

時。」內容談到委派官員以天文方法確定春夏秋冬四季，讓人民知道農耕的時序，以及鳥獸在四季循環裡的變化，說明古代的人們早就認識到氣候與生物世界的緊密關係。

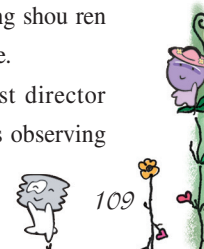
根據學者考據，「羲和」是兩個族的統稱，在我心中，他們是天文台的老前輩，相當於工匠們敬拜的魯班先師。很多人不知道，香港天文台於1883年成立時，最重要的任務其實是以天文觀測來訂定香港的本地時間，然後以「時間球」的方式(見圖)向港內船隻通報，這項工作斯文的叫法是「授時」，大概就是源於《堯典》。

當年晚上以望遠鏡觀星是首任台長的主要工作，他也喜歡以「天文司」Government Astronomer自稱，港督三令五申不可仍依然故我。由於天文工作在我們早期歷史的重要地

stability in his empire was to appoint Xi He to study the sun, the moon and the stars so as to be able to “show people the time” (jing shou ren shi in Putonghua). The officials were to determine the four seasons by means of astronomical observations, so as to help people time agricultural activities. Yao Dian also makes reference to how birds and animals behave following the seasons. Ancient people knew very early that climate and the living world were closely related.

According to researchers, Xi He is the collective name of two tribes. To me, they are the ancient predecessors of the HKO. To HKO people, they are the equivalent of Lu Ban to carpenters and other building artisans. Not too many people are aware that the most important job of HKO when it was established in 1883 was in fact the determination of Hong Kong's local time based on astronomical observations and the dissemination of this information to ships in the harbour by means of the “time ball” (see figure below). In English, this is known as “time service”; in Chinese, the service is called shou shi, a name most probably having its root in the phrase jing shou ren shi in Yao Dian mentioned above.

The main task of the first director of HKO in the early years was observing





位，加上首任台長的固執，我們這個機構的中文名稱不是直譯 Hong Kong Observatory 的「香港觀象台」，而是現在的「香港天文台」。

一個多世紀後的今天，天文和授時始終是香港天文台工作的一部份。我們不再觀星，但是為大家計算日出、日落、月出、月落、日食、月食，以至其他有趣天文現象出現的時間，又在網上發放每月星圖。我們不再掛時間球，但是電台有來自我們的六響時間信號，大家亦可以在網上利用天文台的標準鐘校對時間，歡迎到訪以下連結看看：  
<http://www.hko.gov.hk/nts/ntimec.htm>

從三千多年前《尚書》寫成的時代到今天，科學技術不斷地改變，但是人類和生物要依從天時步伐來調節生活卻是千古不移的。除了物質面貌不

stars through a telescope at night. He liked to label himself as the Government Astronomer in spite of repeated instructions from the Governor not to do so. Owing to the importance of astronomy in our early work and probably reflecting also the stubbornness of the first director, the Chinese name of the HKO (which is still in use today) was rendered Xianggang Tianwen Tai, which means "Hong Kong Astronomical Station" in literal translation. A direct translation of "Hong Kong Observatory" should have been Xianggang Guanxiang Tai, where Guanxiang means "observing phenomena".

Although more than a century has passed, astronomy and time service remain a part of HKO's work. While we no longer observe stars, we do compute the times of sunrise, sunset, moon rise, moon set, solar and lunar eclipses as well as other interesting astronomical phenomena. We also post monthly star maps on our website. While we no longer drop the time ball, we do broadcast the 6-pip time signal over the radio. The time of the Standard Clock is also available to the public via the internet. You are welcome to visit the following link:  
<http://www.hko.gov.hk/nts/ntimec.htm>

More than three thousand years have

同之外，香港天文台幹的仍然是義和的活。

林超英

2009年1月28日

elapsed since the writing of Shang Shu. Science and technology have been changing incessantly. However, one thing has not changed, that is, human beings and indeed all living things still have to synchronize their pace of life with the march of the seasons. Also, apart from superficial differences in technical detail, the Hong Kong Observatory is still performing the same function as Xi He.

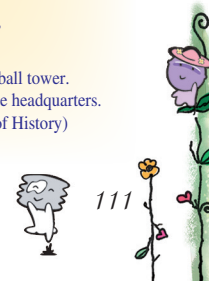
C Y Lam

28 January 2009



圖一：「時間球」每天定時從一個時間球塔頂的桅杆墜下。第一個時間球塔建在尖沙咀舊水警基地所在小山的南側，現時仍然存在，位於文化中心附近。（香港歷史博物館提供）

Figure 1 : The time ball was dropped at a fixed time everyday from the top of the mast on the time ball tower. The first time ball tower was built on the southern side of the knoll accommodating the old marine police headquarters. The tower is still in good shape, located near the Cultural Centre. (Courtesy Hong Kong Museum of History)







## 夜宿大帽山

### Overnight at Tai Mo Shan

網誌有一段日子沒有更新，有市民來信查詢我的健康。感謝大家關心，我的身體尚好，祇是離任在即，不少事情都想多理一些，日子難免比較忙，寫網誌說到底是邊緣業務，所以稍為耽擱了一下。

The blog has not been updated for so long that people wrote to enquire about my health. I am grateful to all who care about me and have the pleasure to report that I am quite alright. The trouble is that because I am going to leave my post soon, I have the urge to do more about whatever comes my way. It makes me doubly busy. Writing blog



最近發生在我身上特別有趣的一件事是到大帽山天文台雷達站渡過了一個晚上。

每逢熱帶氣旋逼近香港，為了保障氣象雷達監視熱帶氣旋的功能不要中斷，天文台的雷達機械師都會進駐大帽山氣象雷達站，二十四小時候命，並隨時搶修故障。三號風球發出便上山，三號風球不取消便一直留在山上，不管是一天、兩天、還是三天。

碰上颱風正面吹襲，狂風怒號，暴雨傾盆，困在香港的最高點，如果發生甚麼意外，上山的路既窄且險，救援頗有難度。同事三號風球時上山，我不知道他們心中有恐懼嗎？此外，撇下了家人讓他們自己面對風雨，作為以保護市民為己任的天文台員工，竟然不能親身保護自己家人，難免有點

articles is in the final analysis a peripheral task which occasionally has to be put aside.

One particularly interesting thing happened to me recently. I spent a night at the Observatory's weather radar station on top of Tai Mo Shan.

Whenever a tropical cyclone approaches Hong Kong, the Observatory's Radar Specialist Mechanics (RSM) would go and stay at the Tai Mo Shan Weather Radar Station, to help ensure the uninterrupted service of the radar in the monitoring of tropical cyclones. They are there round the clock, getting the radar to work at its optimal state and being always ready to repair it in case of any malfunction. They have to be there as the no. 3 signal goes up. They won't leave until the no. 3 signal comes down. They don't care whether the stay lasts one day, two days or three.

They endure howling winds and drenching rain as typhoons hit. Holed in at the top of Hong Kong, it would be hard to rescue them in case of accidents because the mountain roads are narrow and dangerous. I don't know whether they feel any fear as they set off for the peak on the issuance of the no. 3 signal. Furthermore, Observatory



為憾，我不知道在峯頂的風雨飄搖裡他們思家嗎？

抱著這些疑惑，前兩個星期五下班後，我登上了天文台的車，跟雷達機械師同事一起上山，希望在現場親身體驗他們經歷的情況。不消多少分鐘，我們便從繁囂的市區去到荒涼的山地，運氣有點好沒碰上山霧，但是山路的蜿蜒因此更為顯眼，接近雷達站時的幾個「髮夾彎」更是嚇人，幸好開車是久經戰陣的師傅，他告訴我這次屬於「小兒科」，在大風大雨裡跑他們都完全掌握形勢。我相信他，因為以前試過在颱風過港期間，大帽山雷達站電力中斷，服務難以為繼，我們一聲令下，天文台的司機便義無反顧上山去把被困的同事接回來，事後他們報告來回兩程驚險萬分，有時車輛抖動厲害到不得不稍停避風。

staff are supposed to protect people against natural hazards. But they have to leave their families to their own means in facing high winds and heavy rain, which is quite an irony. I wonder if they think of their own families when they are surrounded by wind and rain themselves up there.

It was with these thoughts that I boarded the Observatory car one Friday evening two weeks ago, heading for the peak with my RSM colleagues. I was hoping to feel for myself the process they go through. Within minutes, the hustles of the city were replaced by the calm of the wilderness. We were lucky, there was no hill fog. But that made the sharp turns of the mountain road much more visible. As we approached the radar station, the hair-pin turns were particularly frightening. We were fortunate to be in the hands of a very experienced driver. He told me that it was a piece of cake this time. He had seen much worse weather conditions and was always in control. Well, I believe him. Once upon a time, the power supply to the radar station broke down and the radar was paralysed. On the order "go", the Observatory driver on duty shot off without a blink and took the RSMs back. On their return, they reported



圖一：與同事在大帽山雷達站促膝夜談  
Figure 1 : Discussing with colleagues on Tai Mo Shan till late night



圖二：在雷達站渡過難忘一夜  
Figure 2 : After a memorable night at the radar station





同事的敬業樂業，我必須說一聲：「佩服」。

來到雷達站已是暮色四合，山下是矇矓的華燈初上，人間既在眼前，亦甚遙遠。把站門一關，我們進入另外一個世界，這裏充斥著雷達運轉產生的機械聲音，為了防禦無孔不入的雨水，幾個主要的工作間都沒有窗，二十四小時同樣的燈光令人不知晝夜，身處其間頗有迷離的超現實感覺。我問同事這麼吵他們難受嗎？得到的答覆令我很驚訝，他們說：「雷達的聲音聽來很親切，在站內如果聽不到聲音的話，反而會感覺不舒服，擔心雷達出了甚麼問題。」

他們告訴我，每次在山上當值都感受重大壓力。颱風臨近，市民看天文台，天文台預報員看雷達，雷達壞了等於天文台瞎了，看不到風眼的移

that it was quite an adventure. The car trembled so much that it had to be stopped from time to time to wait for lulls in the wind. My salutes to my colleagues who work with so much passion and dedication!

By the time we arrived at the station, it was already dusk. Glimmering lights at the foot of the hill were visible through the haze. Civilization was in sight but was also very distant. On closing the main door, we transitioned into another world. Here the hum of the radar fills the whole space. To prevent rain-water seepage, the main working rooms have no windows. The lights are on round the clock and there is no way to tell whether it is day or night. A mystic sense of surrealism prevails. When I asked my colleagues whether they felt annoyed by the noise, they surprised me with their reply. "The hum of the radar is music to our ears. If we don't hear it in the station, we would feel very uncomfortable and worry about what has gone wrong."

They told me that every time they were up there they felt the heavy burden of responsibility. As typhoon approaches, all Hong Kong citizens would be watching the Observatory while Observatory forecasters would be watching the radar. If the radar

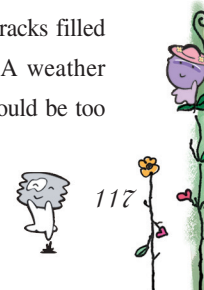
動，牽一髮動全身。不在現場，我以前沒法感應到他們心中的憂慮，在這個大帽山頂的晚上，我確切知道同事重視自己的工作和明白自己的任務，以及跟他們一起承受責任感無可避免帶來的心理負擔。我們談到深夜，最後睡倒在各自帶來的睡袋中。

房間沒有窗，不知天亮，結果睡到8時多，感覺頗為失禮。吃了山上儲存備用的即食麵，跟同事巡視站內的所有角落，他們告訴我夜裡下了一場雨，雨勢雖然不大，站內卻多了幾灘水，看來乘著山風的雨水不會放過任何滲透縫隙的機會，今年雨季來臨之前真的要好好檢查和修復，以免發生大雨浸壞氣象雷達的難堪笑話。

在雷達塔上繞了一圈，極目四望香港全境，在山巒起伏中到處藏著繁華，養活著七百

breaks down, the Observatory would effectively be blind and could not see where the typhoon eye is. It would not have been possible for me to resonate with their worries if I had not come to the scene of real action. On this special night on Tai Mo Shan, I knew well that my colleagues took their job seriously and they clearly understood their mission. I also shared with them the unavoidable psychological burden arising from our sense of responsibility. We talked till late night and eventually retired to the sleeping bags that we each brought with us.

The room having no window, sunrise was not noticed. I slept beyond eight o'clock which was somewhat embarrassing. Breakfast was instant noodle, which had been on stock at the station for some time. We then thoroughly inspected the station building. I was told that rain had fallen overnight. While it was not heavy, rain still managed to get into the station leaving patches of water here and there. Rain drops carried by strong winds in the hills would appear to be quite capable of finding cracks and slipping through them. Indeed we must do a good check and have all cracks filled before the rain season starts. A weather radar drowned by rain-water would be too





萬人口，這裏自然陪伴著文明，真是好一片福地。

下山的時候終於到了。大帽山，此刻一為別，後會是何期？

林超英

2009年3月2日

satirical a joke.

On the radar tower, I had a walk on the verandah and took in a 360-degree view of Hong Kong. One could see here and there in the embrace of hills and valleys patches of prosperity which together sustain the livelihood of a population of some seven million. Civilization thrives in the company of nature. It is such a miracle.

Finally, it was time to go. Tai Mo Shan, when would our paths cross again?

C Y Lam

2 March 2009

附：除了在風雨中守護大帽山雷達之外，天文台同事在工作中有不少罕為人知的任務和經歷，最近我們收錄了四十多篇同事所寫的文章在《風雨人間》一書之中，大家可以看看。該書在政府網上書店 <http://www.bookstore.gov.hk> 及幾家主要郵局發售，詳情見：<http://www.weather.gov.hk/wxinfo/news/2009/pre0122c.htm>。近來數家中文書店亦有出售，請直接向他們查詢。

P.S. Apart from guarding the radar at Tai Mo Shan, Observatory colleagues carry out many tasks and go through many interesting situations rarely known to the public. We have recently collated more than forty articles written by Observatory staff in the book *Weathering the Storms*. It is worth a read. The book is available for sale via the internet <http://www.bookstore.gov.hk> and from several major post offices. See the link <http://www.weather.gov.hk/wxinfo/news/2009/pre0122e.htm> for details. Lately, the book is also on sale in a number of major bookshops. Please call them to check availability.



## 超強颱風、溫黛再世

### *Super Typhoon- the Reincarnation of Wanda*

退休在即，記者朋友碰到我都問任職天文台三十多年有甚麼難忘的憾事。我為人樂觀，其實沒有甚麼遺憾，但是作為氣象人員，感到最難過的是無論我們多努力發出災害性天氣預警，總是有人在颱風襲

As my retirement approaches, reporters keep on asking me what my greatest regret is during my thirty plus years at the Observatory. I am optimistic by nature and really have nothing to regret about. However, as a meteorologist, what I feel sorry about most is that no matter how hard we try, certain people would always ignore the warnings of severe weather we







港期間，妄顧警告，在街上流連，甚至到海邊看浪嬉水，以身犯險，造成傷亡。

面對這種情況，為了使公眾對一些風力特別強的颱風提高警惕，今年起我們按風力把颱風分為三級：颱風、強颱風和超強颱風。

|      | 中心最高風速<br>(公里/小時) |
|------|-------------------|
| 颱風   | 118 - 149         |
| 強颱風  | 150 - 184         |
| 超強颱風 | 185 或以上           |

上一次超強颱風正面襲港是1979年荷貝，至今剛好三十年，年輕一輩的朋友沒有親身經歷過勁風急雨，近年來逐漸產生了輕視颱風來襲的心態，祇把8號甚至10號風球視為休假一天的代名詞，他日荷貝再來，恐怕在防備不周的情況下會造成重大傷亡，以現今社會風氣來看，到時捱罵的大概又是香港天文台。背黑鍋我們已經習慣了，不是甚麼問題，但是努力工作之後仍然發生本來

issue. During the passage of typhoons, we see people walking around in the streets or watching waves at the seashore or even venturing into the sea to get a jerk out of it. They throw themselves into harm's way and some get killed.

In the light of this situation, we find it necessary to prompt the public to be more vigilant about those typhoons which are packed with winds of particularly high wind speeds. From this year onwards, typhoons are divided into three categories according to their wind strength viz. Typhoon, Severe Typhoon and Super Typhoon.

|                | maximum wind<br>at the centre (km/hour) |
|----------------|-----------------------------------------|
| Typhoon        | 118 - 149                               |
| Severe Typhoon | 150 - 184                               |
| Super Typhoon  | 185 or above                            |

The last time a Super Typhoon gave Hong Kong a direct hit was Hope of 1979. Three decades have passed. The younger generation has never experienced the wind and rain in a Super Typhoon, and no longer realizes that the approach of typhoons is a threat. Instead, they treat the No. 8 or even No. 10 signal as the synonym of a day off. Next time a typhoon like Hope returns, I am worried that the lack of preparedness would lead to significant casualties. If that

可以避免的傷亡則始終是氣象人的最大遺憾。

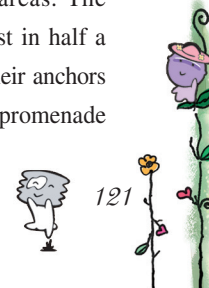
過去半世紀，除了1979年的荷貝，正面襲港的超強颱風還有1962年的溫黛、1964年的露比和1971年的露絲，其中溫黛和露絲都各自在香港奪去過百人的性命。我們這一代人每次想起這兩個超強颱風都猶有餘懼。近年愈來愈多人有一個錯覺颱風再不可怕，但是真正的事實是香港已經很久沒有受到超強颱風正面吹襲的考驗。

去年9月23日強颱風黑格比，在香港西南偏南180公里掠過，是一次給香港人的警示。黑格比論強度尚未及溫黛或荷貝，而且不是正面襲港，但是已足以導致最少58人受傷，在多處低窪地區造成水浸，大澳的災情更是半世紀以來最嚴重的一次，另外還有三艘船被大浪沖斷錨鏈，撞毀尖東海濱長廊。事後，我們在電腦中計算過，祇要黑格比稍為靠近100

happens, with the Hong Kong society as it is, a lot of blame would most probably be loaded onto the Observatory. We are now used to such things, that is not an issue. What meteorologists do feel sorry about is that avoidable loss of lives continues to happen no matter how hard we work.

Apart from Hope of 1979, the other Super Typhoons which hit Hong Kong directly were Wanda of 1962, Ruby of 1964 and Rose of 1971. Wanda and Rose each killed more than one hundred persons in Hong Kong. My generation still remembers vividly the horror of living through the visits of these two Super Typhoons. However, in recent years, more and more people acquire the illusion that there is nothing to fear about typhoons. The truth is that Hong Kong has not been tested by a Super Typhoon for a long while.

Severe Typhoon Hagupit last year was a warning sign. It passed 180 kilometres to the south-southwest of Hong Kong on 23 September. It was not as strong as Wanda or Hope. It was not a direct hit. But it was sufficient to cause at least 58 injuries and flooding in many low-lying areas. The damage at Tai O was the worst in half a century. Three ships dragged their anchors in high seas and damaged the promenade





公里，風暴潮便會再升高1至2米，被海水淹沒的地方會多得多，後果真是不堪設想。我們不得不為我們這個城市捏一把汗。香港不可能永遠幸運，下一次也許是超強颱風，下一次也許更靠近，對於颱風，大家必須嚴防啊！

我們今次發佈有關颱風分級的消息後，有人覺得有混亂。讓我重申一句：香港的風球制度本身，一點都沒有變，它的任務是告知大家香港預測風速的變化。當香港受到颱風正面吹襲時，不論是「颱風」、「強颱風」或是「超強颱風」，天文台都發出10號警告信號，市民及各個機構都應該採取全套的防禦措施。

颱風的三個級別祇是說明颱風本身的強度，如果距離香港很遠，不影響香港的風力，就算是一個超強颱風，香港也不必有風球，這個道理是比較明顯的，請大家留意。

at Tsimshatsui East seashore. After the event, we re-computed the storm surge by moving Hagupits track 100 kilometres closer to Hong Kong and found that it would be 1 to 2 metres higher. Many more places would have been flooded and the consequences would be mind-boggling. We have been incredibly lucky. But we could not be forever lucky. Next time it might be by a Super Typhoon. Next time it might come closer. We must be very vigilant against typhoons.

After our recent announcement about the new categorization of typhoons, certain people thought that it was confusing. Let me clarify that the system of local typhoon signals remains unchanged. Its mission is to tell people how winds will change in Hong Kong. The No. 10 signal will be issued in a direct hit by a typhoon no matter whether it is "Typhoon", "Severe Typhoon" or "Super Typhoon". Everybody and all organizations should always take the full range of precautionary actions in a No. 10 situation.

The categorization of typhoons is merely a means to describe the strength of the typhoon itself. If a Super Typhoon is far away from Hong Kong and has no influence on local wind speeds, then no typhoon signal is necessary. Please take

在我任內，沒有超強颱風如溫黛或荷貝正面吹襲香港，是一種幸運，但是正如我前面說過，幸運不可能永遠。居安思危，在離任之際，讓我鄭重提醒大家，下次從收音機或電視的天氣信息中知道有強颱風或超強颱風襲港時，必須特別提高警覺，它可能就是溫黛再世。

林超英

2009年3月27日

good note of this fairly simple principle.

During my tenure as Director of the Hong Kong Observatory, no Super Typhoon like Wanda or Hope gave Hong Kong a direct hit. I have been lucky. Hong Kong has been lucky. But it is impossible to be forever lucky. We should remember that danger is always lurking round the corner. As I leave my post, I would like to sincerely ask everyone to be prepared. Next time you hear on the radio or see in the television that a Severe Typhoon or Super Typhoon is coming to Hong Kong, be extra vigilant. It could be the reincarnation of Wanda.

C Y Lam

27 March 2009



圖一：溫黛襲港，破壞嚴重。（香港歷史檔案館提供）

Figure 1 : Wanda caused serious damage in Hong Kong. (Courtesy HKSAR Public Records Office)







## 道別 *Farewell*

1974年5月4日我從彌敦道尖沙嘴街坊會旁邊一條小路上山，穿過一個小樹林，來到古典幽雅的香港天文台總部，有些興奮，有些忐忑。興奮因為中學二年級已經想到加入天文台工作，此刻願望成真。忐忑

On 4 May 1974, I walked uphill from Nathan Road, through a small path next to Tsimshatsui Kaifong Association. After passing through a small wood, I arrived at the headquarters of the Hong Kong Observatory, housed in an elegant building of the colonial era. I was both excited and worried. Excited because I was about to fulfill my youthful dream since I was in

因為讀書學習這麼多年，為的就是這一天，但是究竟我準備好了嗎？

我的興奮很快就過去了，因為天氣預報員碰上幾次「天有不測之風雲」後，最快學懂的是在自然面前謙卑。忐忑同樣地很快就過去了，因為天文台人數不多，很像一個大家庭，每天上班都有如回到另外一個家，感覺很舒暢。

開心的日子過得真快，轉眼間便三十五年，不少人眼中平淡乏味的公務員生涯，在我心中卻是風光無限的人生旅程，沿途碰到無數的人和事，沒有預先計算，祇是隨緣應對，我在實踐中累積經驗和成長，漸漸地由原來滿腦子祇有科學，演化到今天知道要在理性與感性之間取得平衡，以及重視人與人之間互相尊重和關懷。

Form 2 to join the Observatory. Worried because on this day of reckoning, I was not sure whether I was sufficiently prepared in spite of the many years of studying.

The excitement was soon over. Like any forecaster, I bumped into “unpredictable weather” and learned quickly that the only way to approach Nature is to be humble. My worries dissipated quickly too. The Observatory was a small department and it felt more like a family than anything else. Going to work was like returning to a home away from home. Life was nice and comfortable.

Happy times went by truly fast. Thirty-five years passed in no time. While many might see the life of a civil servant as boring and uninspiring, from my own perspective it has been a life journey with incessant, great sceneries. I ran into numerous people and happenings on the way, more by chance than by any calculated moves. It was more like responding to circumstances as they emerged. I matured as my experience grew through real-life encounters. Initially my mind was preoccupied with scientific ideas only. Gradually I learnt to appreciate the need to maintain a balance between reason and feeling and to place great importance on love and mutual respect among people.







圖一：「天文台同事送給林先生的紀念品－天文台台徽和以百計的天文台人員照片」  
Figure 1: "The souvenir for Mr Lam from Observatory colleagues - the Observatory logo and hundreds of photographs of Observatory staff"

我感恩上天給我難得的機會在天文台成長，亦感謝一路上與我作伴的同事對我的支持和包容。

離別之際，讓我向天文台的同事再一次叮嚀，行事必須以科學為基礎，以服務為目的，以人民的生命為第一考慮。

I am grateful to Providence for giving me this rare opportunity to grow up at the Observatory. I also thank my companions at work on this long journey for their support and tolerance.

On my departure, I would like to remind my colleagues about how the Observatory is to be run. Science should be the foundation, and service, the objective. Furthermore, the safety of human lives should always be the priority consideration.

最後，以七絕一首向同事道別：

Finally, I would like to bid farewell by sharing with my colleagues the following lines (originally a poem in Chinese) :

天心無盡奧難明  
文理交融志滿誠  
台務耕耘劬亦樂  
人間風雨總還晴

The infinite heavenly mind is beyond comprehension.  
Merging science and humanity we are full of passion.  
Observatory work is like ploughing, it's tiring but fulfilling.  
Weathering the storms, have faith for the sun's return shining.



圖二：送給天文台同事的紀念扇（正面）  
Figure 2: Souvenir fan for Observatory colleagues (front)



圖三：送給天文台同事的紀念扇（背面）  
Figure 3: Souvenir fan for Observatory colleagues (back)

此後下山回到民間，天空再不是肩上的負擔，而是大自然千姿百態表演的舞台，我將放開懷抱，用心欣賞。

Soon I shall descend the hill and return to the citizenry. The sky will cease to be a burden on my back, but will rather be the stage on which Nature displays its wonders. I shall sit back and watch with admiration.

林超英  
2009年4月5日

C Y Lam  
5 April 2009





剛從林超英先生手中接過棒，立即便感受到來自各方的期盼。

打個比喻，以前作為天文台的一份子，每天的工作就像早上打開一個信封，裏面的指示便告訴我們當天要達到什

As I took the baton from Mr C.Y. Lam, the expectations from all over are immediately felt.

Let's use a metaphor. Previously, as a member of the Observatory we opened a secret envelop every morning and knew where we would be heading the rest of day. Now it falls onto me to prepare these envelopes and chart the

麼。現在則要由我來預備這些信封，為天文台刻劃未來。

當然，作為台長，在預備這些「信封」時各方面都給我很多提示。但要在眾多叉路中取捨，有時十分困難。

不過有一樣是肯定的，就是所有決定必須要以科學為基礎。這是天文台必然奉行的路向。我很幸運，有多位前輩已樹立了榜樣。

雖然近年氣象和地球物理科技不斷進步，但我們仍面對很多挑戰。例如在預測天氣方面，儘管我們一般可以預報未來數天的氣溫，但要準確預測未來幾小時的雨量卻仍然甚難。

同樣地，雖然現代的數值模式已能計算出一個熱帶氣旋在未來數天大致的移動方向，但仍難以在數小時前確切預知它將於何時及何處登陸。因此，如何在操作熱帶氣旋警報

Observatory's future.

True, the Director takes cues from inside and outside when preparing these 'envelops'. But when it comes to making a choice among possible paths the decision is sometimes very hard to make.

One thing is for sure, however. The decision has to be firmly based on science. This will continue to be so for the Observatory. I have the benefit of many great leaders before me.

Despite recent advances in meteorology and geophysics, we still face many challenges. A case in point is weather prediction, where we are reasonably confident in forecasting the temperatures a few days ahead, but foretelling very accurately how much rain there will be in the next couple of hours is still a struggle.

Likewise, while numerical models nowadays are quite capable of telling us a few days ahead where a tropical cyclone will generally head, difficulties remain in pinpointing when and where it will make landfall in a few hours' time. Thus operating the tropical cyclone signals to meet the expectations here in Hong Kong is still a trying experience.







方面達到市民的期望，仍是一個考驗。

在應對以上種種挑戰時，我們必會繼續進行科研和運用最新的科技。這涵蓋我們所有工作，包括航空氣象及安全、地震、海嘯、輻射監測、以至氣候變化等。

我們將繼續服務社會各階層，特別是弱勢社羣，並繼續推動科普。在香港這個知識型的社會，科普工作尤其重要。

我期望得到您和市民大眾的支持。

李本澄

2009年4月9日

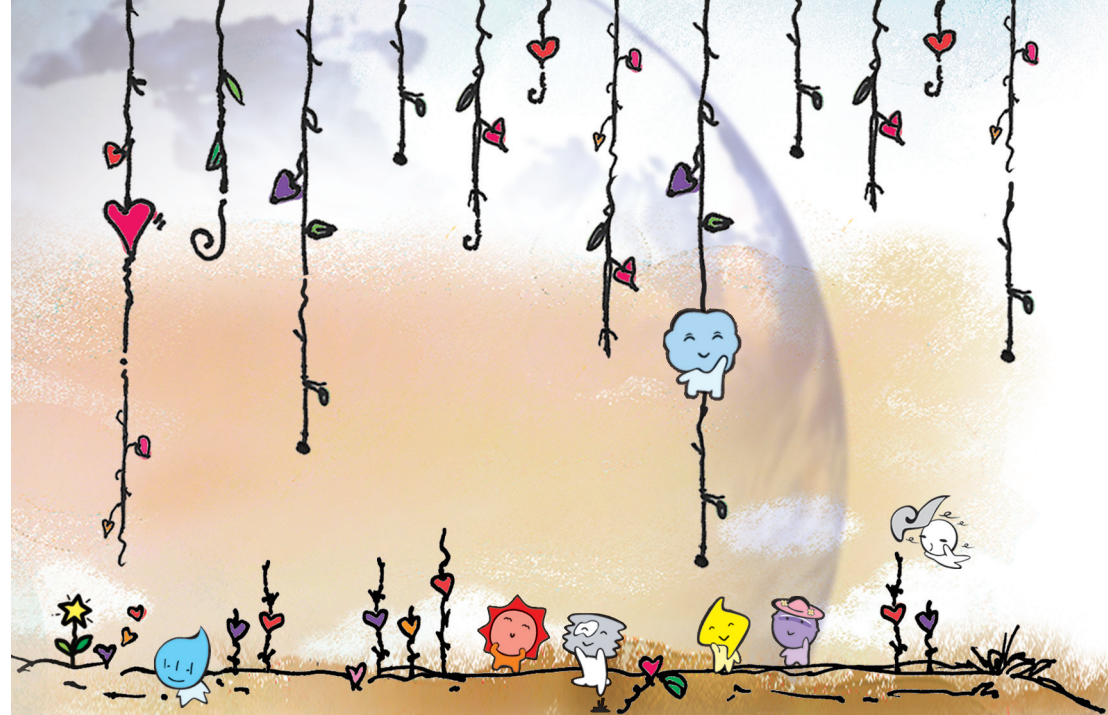
To address these challenges, let me assure you that we will continue to conduct studies and apply the latest science and technology available. This covers all our work, including aviation weather and safety, earthquake/tsunami observation, radiation monitoring, and last but certainly not the least, climate change.

We will continue to reach out to the community, especially the underprivileged. We will popularize science, which I must say is very important in this knowledge-based economy.

For all these, we look forward to the support from you and from members of the public.

B Y Lee

9 April 2009



## 歷史為什麼重要？

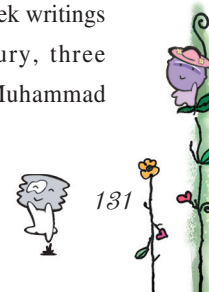
### *Why is history important?*

一篇有關科學史的雜誌文章促使我近日重讀了一本講述中東歷史的書。

據該書所載，自公元九世紀開始，即先知穆罕默德出生後三個世紀，有大量的希臘文獻被翻譯成阿拉伯文。當時西

A magazine article on science history prompted me to re-read a book about the history of the Middle East the other day.

As the book recounts, there was active translation of major Greek writings starting from the 9th century, three centuries after the birth of Muhammad







方世界對古代大哲學家 and 科學家（如蘇格拉底、柏拉圖、亞里士多德、歐基里德和亞基米德等）的作品，並不感興趣。有些重要的希臘著作甚至已經失傳。

公元八世紀，中東從中國工匠學會了造紙，其後更發展了造紙工業。至九世紀，巴格達的回教領袖大力促進將希臘文獻翻譯成阿拉伯文。眾所周知，巴格達正是阿拉丁神話「一千零一夜」的發源地。

中世紀的中東並不僅滿足於繼承希臘以至遠東的文明。相反，伊斯蘭科學家在前人的基礎上進行深入的觀測和實驗。希臘科學普遍側重理論，而中東科學則相當講求實際，為現今世界留下了豐富的科學遺產。

一門新的算術誕生了一因此我們現在廣泛使用「阿拉伯數字」（它實際上源於印

the Prophet. That was at a time when the western world was rather uninterested in the works of great philosophers and scientists in the older days, such as Socrates, Plato, Aristotle, Euclid and Archimedes. Some important Greek works were even lost permanently.

The translation of Greek texts into Arabic was promoted by Muslim rulers in Baghdad at the time. This followed from the emergence of a paper industry there after the know-how of paper-making was captured from Chinese craftsmen in the 8th century. Baghdad, as many of us know, is the setting for the story of Aladdin in Thousand and One Nights.

The medieval Middle East did not just sit on the Greek learning, nor on knowledge from the distant East alone. Instead, Islamic scientists went to great lengths in their observations and experiments. While Greek science tended to be rather theoretical in general, Middle Eastern science was very practical. It handed to the modern world a rich scientific heritage.

A new arithmetic was started – a reason why we use the so-called 'Arabic

度）。雖然希臘人發明幾何學，但三角學大部分是中東所創。代數則全然是中東（或巴比倫）的發現。

在天文學、化學和醫學方面亦有很大的成就。十六世紀哥白尼可能是受到伊斯蘭天文學家的啟發而創建了日心說。鹼和強酸（硫酸和鹽酸）都是由伊斯蘭科學家發現。一本中東的醫學百科全書於十三世紀被翻譯為拉丁文，在其後多個世紀支配了整個歐洲醫學。而透過土耳其人，天花疫苗法在十八世紀傳到西方。

今天很多科學名詞均源自中東—煉金術（alchemy）、鹼（alkali）、代數（algebra）、演算法（algorithm）等等，不能盡錄。而algorithm一字其實是九世紀在巴格達工作的偉大波斯數學家al-Khwarizmi的拉丁語。

自九世紀開始的八百多年

numerals' nowadays (which actually had their origin in India). While geometry was a Greek innovation, trigonometry was mostly a Middle East invention and algebra an entirely Middle Eastern (or Babylonian) discovery.

There was also much advance in astronomy, chemistry and medicine. Planetary theories developed by Islamic astronomers may have inspired Nicolaus Copernicus, who formulated a sun-centred (or heliocentric) cosmology in the 16th century. Alkalis and strong acids (sulphuric and hydrochloric acid) were both discovered by an Islamic scientist. A Middle Eastern medical encyclopedia translated into Latin in the 13th century dominated the European medical scene for centuries after that. Smallpox vaccination became known in the west in the 18th century, through Turkish people.

Many scientific terms in use today have their Middle East origin—alchemy, alkali, algebra and algorithm, to name a few. The last term, algorithm, is the Latin name for al-Khwarizmi, the great Persian mathematician who worked in Baghdad in the 9th century.

Starting from the 9th century, the





是中東多產的時期，而西方的文藝復興延續了這探索與創新的傳統。借用美國歷史學家柏納·路易斯（Bernard Lewis）的說話，回教徒創造了「一個超越單一種族、地區或文化的宗教文明。在中世紀高峰時期的伊斯蘭世界是跨國、跨種族，甚至可以說是跨越多個大陸的。」

歷史告訴我們很多事情。科學的歷史最少教曉我們，待人接物，必須包容接納、集思廣益，不問出處。

李本澄  
2009年4月24日

productive period went on for more than 800 years. The tradition of discovery and innovation was continued with the advent of Renaissance. In the words of the American historian Bernard Lewis, the Muslims created “a religious civilization beyond the limits of a single race or region or culture. The Islamic world in the high Middle Ages was international, multi-racial, polyethnic, one might even say intercontinental.”

History tells us many things. The history of science tells us at least one thing-be inclusive and accepting to others, no matter where they come from.

B Y Lee  
24 April 2009



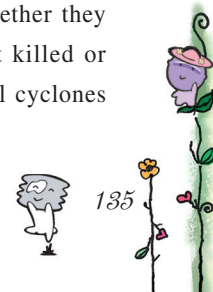
## 天氣災害 Weather hazards

上星期有兩個熱帶氣旋，一在南海，一在西太平洋，提醒我們已踏入風雨季。

我最近與一班小學生見面時，問他們知否每年因熱帶氣旋襲港而導致多少人傷亡：（一）一百或以上；（二）十

Last week's two tropical cyclones, one in the South China Sea and the other in the western Pacific, remind us that we are once again into the rain and typhoon season.

I recently met a group of young students and asked them whether they knew how many people got killed or injured each year by tropical cyclones







或以上；還是（三）少於十？結果他們多數選擇（一）或（二）。我相信大部分市民亦會選擇同樣答案。

然而，圖一顯示的傷亡數字應會令大家改觀。

事實是，因熱帶氣旋襲港而引致的傷亡人數近年已下降至只有幾個。暴雨引致的傷亡情況也是差不多。

何以如此？我想主要有三個原因。第一，香港有一個非常健全而且不斷完善的天氣預警系統。在這個系統下，公眾知道如何一致採取預防措施，而各緊急服務單位能協調運作，啟動行之有效的救援。

第二個原因是天氣預測的能力，尤其是熱帶氣旋方面有所進步。從圖二可見，過去數十年熱帶氣旋警告的生效時數大致有所下降，因而減少了對市民生活的干擾，提升了社會效率。

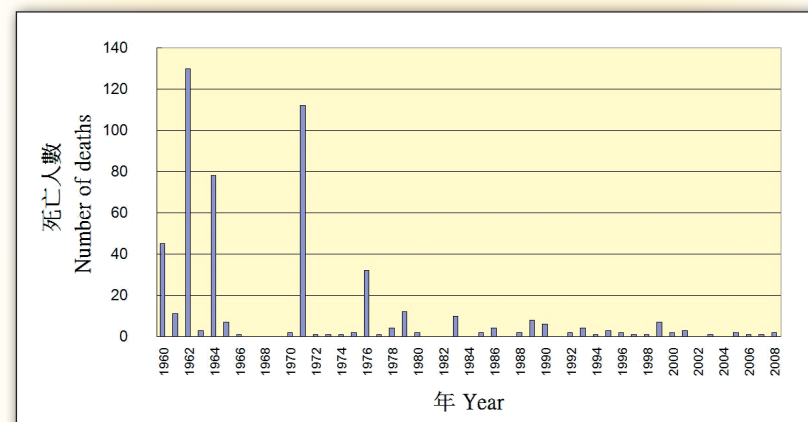
hitting Hong Kong. The question was put to them in multiple choices : (a) 100 or more; (b) 10 or more; and (c) a few. A majority of them picked (a) or (b). I believe many members of the public also share this view.

The casualty figures presented in Figure 1 below should dispel that impression, however.

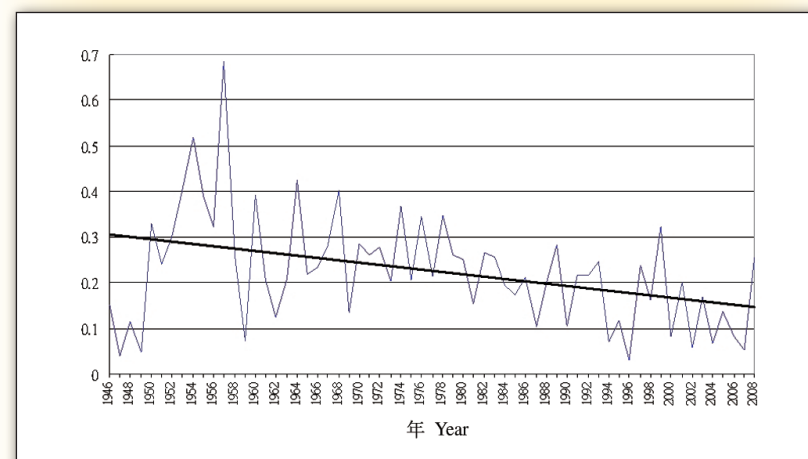
The amazing fact is that the figures have gone down to only a couple of casualties in recent years. The same can be said about casualties caused by heavy rain.

So, what has happened? Three reasons can be given. One is that Hong Kong has a very robust weather warning system that is being constantly improved upon. Under this system, members of the public know how to respond in unison in their precautionary measures while the emergency services activate their time-tested operations in a well coordinated manner.

The second reason is the advance in general in weather forecasting especially in the prediction of tropical cyclones. Figure 2 below gives a flavour of how the duration of tropical cyclone warnings has on average decreased over the years. The



圖一：1960-2008年期間襲港熱帶氣旋引致的傷亡  
Figure 1 : Casualties caused by tropical cyclones hitting Hong Kong during 1960-2008



圖二：3號或以上熱帶氣旋警告信號時數除以熱帶氣旋在香港800公里內總時數  
Figure 2 : Number of hours with Tropical Cyclone Warning Signal Number 3 or above divided by the total number of hours with tropical cyclones within 800 kilometres of Hong Kong





第三，亦是最主要的原因，是過去幾十年本港的房屋和其他基建出現很大的改善。以前因小艇沉沒、山邊臨時房屋被洪水沖走、或山泥傾瀉而造成大量人命傷亡的日子已一去不返。

但我們不能自滿。首先，儘管近年天氣預測的技術有所提升，但始終不可能百分百準確。公眾仍須留意短時間內發出的警告，作出適當的反應。

第二，由於氣候變化，科學家相信颱風可能變得更強，暴雨可能來得更兇猛。因此，天文台最近增加了「強颱風」和「超強颱風」兩個級別，以加強市民對熱帶氣旋的警覺。我們不能掉以輕心，否則若然1960年代的「超強颱風」溫黛或露比，或1966及1972年的特大暴雨重臨，香港仍會遭到嚴重破壞。

decrease translates into less disruptions to normal life and higher efficiency for society.

The third, and by far the most important, reason is the tremendous improvement that has been brought to housing and other infrastructures over the past few decades. Gone are the days when scores of people got drowned in their sampans or dinghies, or swept away in their temporary hillside dwellings by floodwater and failed slopes.

But there is no room for complacency. First, despite its recent advance, weather forecast by its very nature is a projection into the future. It is not possible to be 100% accurate all the time. For this reason, the public should still beware of occasions with weather warnings issued at short notice and make the appropriate response.

Second, because of climate change scientists believe that storms may become fiercer and rains ever heavier. To face the eventuality of typhoons getting ever stronger, the Observatory has recently added two additional categories to the classification of typhoons, viz. severe typhoon and super typhoon, so as to heighten people's awareness towards their

天文台自當致力及時發出天氣預警，但市民亦必須時刻留意電子傳媒、互聯網或「打電話問天氣」發放的天氣報告，遠離災害，並採取適當的預防措施，否則仍會有人在洪水、大風和洶湧波濤中白白喪失生命。

下一個網誌，我會談談其它能與颱風和暴雨相比或更危險的惡劣天氣。

李本澄

2009年5月15日

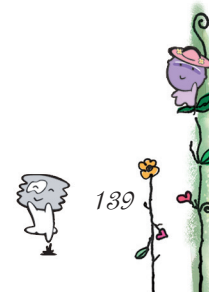
dangers. If we are not careful, a repeat of super typhoons like Wanda and Ruby in the 1960s or the deluges in 1966 and 1972 would still wreck havoc in Hong Kong.

While we at the Observatory spare no effort in ensuring the timely issuing of warnings, it remains imperative that people listen to the weather announcements on electronic broadcasting media, Internet and automatic telephone answering services, stay away from the hazards and take appropriate precautionary measures. Otherwise we still have to contend with people unnecessarily losing their lives in floods, high winds and in stormy waters.

In the next blog, I will talk about what other weather hazards there are around us, which may be equally if not more dangerous than typhoons and rainstorms.

B Y Lee

15 May 2009







## 食過五月粽，寒衣收入槓？

### *Dragon boats in May, stow the blanket away?*

端午將至，很多人問我們由於近年氣候變暖，是否可早一點收起寒衣和棉被？

我翻查了過去數十年端午節前後的氣溫記錄。以25度作為舒適的晚間最低氣溫，那麼，在端午節及之前六日期

As the Dragon Boat Festival draws near, we at the Observatory are often asked the question whether the weather has got so warm these days that blankets and winter clothing can be put away earlier.

I have looked at temperature readings around the time of Tuen Ng (Dragon

間，最低氣溫在25度或以下的日數為：

| 年份        | 日數       |
|-----------|----------|
| 1979-1988 | 35 (50%) |
| 1989-1998 | 24 (34%) |
| 1999-2008 | 21 (30%) |

可以說，二、三十年前，香港在端午節期間的晚間約有一半日子屬於舒適。這些日子消失得很快，現在僅剩下約三分之一。

氣候變化的科學證據毋庸置疑。香港受雙重影響—既受全球暖化影響，亦受本地都市化的威脅。後者是城市發展和人口增長的結果。

按照目前的推算，香港到2030-39年的十年間，年平均日數最低氣溫在12攝氏度或以下將少於一日。可以說，到時我們將再沒有冬天。「打邊爐」和穿冬裝消失的日子相去不遠。

這只是二十年後的事。若我們現時生活和社會發展模式不變，這情況可能更早出現。

Boat Festival) over the past few decades. Taking a minimum of 25 degrees Celsius as a comfortable temperature for the night, the number of days having this temperature or lower for the 7-day period ending on Tuen Ng is:-

| 10-year period | No. of days |
|----------------|-------------|
| 1979-1988      | 35 (50%)    |
| 1989-1998      | 24 (34%)    |
| 1999-2008      | 21 (30%)    |

It could thus be said that 20 to 30 years ago, nighttime in Hong Kong was comfortable half of the time during the Tuen Ng period. We are losing this fast, and now it has gone down to less than one-third of the time.

Scientific evidence supporting climate change is strong and unequivocal. Hong Kong is hit by a double whammy—global warming and urbanization, the latter a result of city development and population growth.

The current projection for Hong Kong is that, by the decade 2030-39, the number of cold days, i.e. those with a minimum of 12 degrees Celsius or below, will on average be less than one per year. A more dramatic way of putting this is by that time we will lose winter altogether.





要遏止全球暖化，必須全球同心協力。作為香港人最起碼可以做的，是簡約生活、少耗能源。

李本澄  
2009年5月25日

Gone will be the days of hot pots and winter fashion.

This is only 20 years from now, and is set to happen earlier if the current way of life and society development does not change.

It takes global effort to contain the warming. The least we Hong Kong people can do is to adopt a simple, less energy-intensive lifestyle.

B Y Lee  
25 May 2009



去年（2008年）香港的天氣破了多項記錄。

首先，最令人難忘的是一月底至二月中旬出現了持續二十四日的低溫，是四十年來最長的寒潮。

The past year, 2008, saw a number of weather records broken in Hong Kong.

First, it would be best remembered as a year with the longest cold spell in 40 years, which lasted 24 days from late January to mid-February.







此外，出現多項雨量新記錄。去年六月暴雨帶來了1346.1毫米雨量，是1884年有記錄以來最多雨水的一個月。6月7日則錄得一小時內145.5毫米雨量，遠超過以往的記錄（前記錄是2006年7月16日的115.1毫米）。4月19日全日共錄得237.4毫米雨量，是歷年四月份的最高的日記錄。而11月3日上午一小時錄得46.6毫米雨量，亦是有記錄以來十一月份最高。

氣溫方面，2008年10月的平均氣溫為26.5度，是記錄上最暖的十月。

以上種種告訴我們，天氣愈來愈走向極端。科學上，我們不能將這些現象全部歸咎於氣候變化。然而，從報章可見，世界上很多地方都正在經歷更多極端天氣。而氣候專家很早已指出，極端天氣會愈來愈多，愈演愈烈。

Apart from this, several rainfall records were also broken. The deluges in June 2008 brought 1346.1 mm of rain, making it the wettest month since record began in 1884, while the hourly rainfall of 145.5 mm on 7 June broke all past records by a wide margin (Note : the last record was 115.1 mm, recorded on 16 July 2006). The 237.4 mm on the day of 19 April was an all-time daily high for April, while the hourly rainfall of 46.6 mm in the morning of 3 November was the highest for the month of November.

Temperature-wise, October 2008 with a mean of 26.5 degrees was the warmest October ever.

All these are telling us one thing- we are facing more weather extremes. Scientifically, it is not possible to blame them 100% on climate change. However, newspapers are telling us that many places in the world are experiencing more weather extremes than ever. Climate scientists have long indicated that practically everywhere in the globe, more and more extremes are on the way.

The Intergovernmental Panel on Climate Change (IPCC), which received the Nobel Peace Prize in 2007 for its work

2007年因氣候變化工作而獲諾貝爾和平獎的「政府間氣候變化委員會」（IPCC）指出，全球暖化是不容爭辯的事實。在香港，記錄上最暖的十年中，其中六年是於最近十年出現的。

今年發表的國際研究，提出了進一步的警告。英國氣象局科學家模擬全球即時停止所有二氧化碳（造成全球暖化的主要溫室氣體）排放，即是假設我們立刻停止所有使用石化燃料的電廠、交通工具的運作以至工業生產之後，會出現的情景。

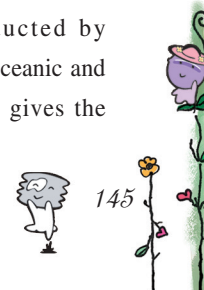
研究發現，即使如此，由於大自然僅能吸收其中一部分的二氧化碳，未來一百年空氣中二氧化碳濃度仍會處於高水平。結果是全球不會冷卻，持續處於高溫。更甚的是，假設我們在四十年後（即2050年）才停止所有二氧化碳排放，未

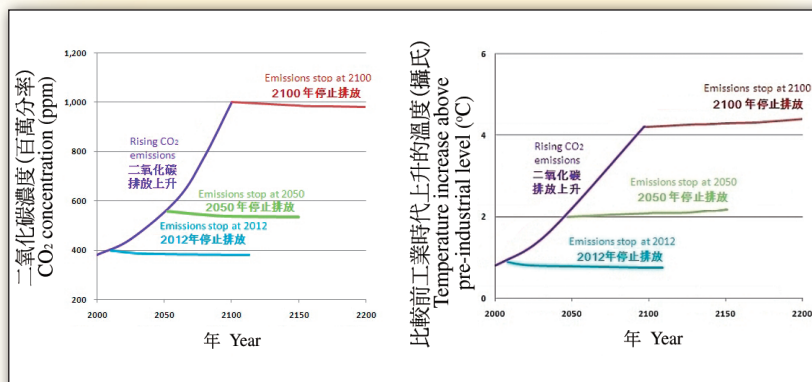
on climate change, concluded that climate warming is unequivocal. For Hong Kong, six of the ten warmest years on record occurred in the past ten years.

Results of international research work published this year raise the alarm further. Climate modelling work has been carried out by scientists from U.K. Meteorological Office to find out what would happen if all emissions of carbon dioxide, the major greenhouse gas contributing to global warming, stop immediately. That is, we instantly cease all fossil-based power generation, transportation, industry and manufacturing.

The study finds that even so, the carbon dioxide level in the air would remain high for the next 100 years because nature can only take up a fraction of it. The effect of this is that global temperatures would stay up. That is, there would not be any appreciable cooling. Worse, if all emissions stop 40 years from now, i.e. 2050, temperatures would continue to rise further for at least a century.

A similar study conducted by scientist from U.S. National Oceanic and Atmospheric Administration gives the





圖一：摘錄自《自然》雜誌第458期1093頁，2009年4月出版（經簡化，原文為英文）  
Figure 1 : Simplified from an article in Nature, Vol. 458, p.1093, April 2009.

來最少一個世紀全球氣溫將繼續上升。

類此的研究，美國國家海洋及大氣管理局科學家亦得出同樣結論，只是情況更為惡劣：二氧化碳的濃度在未來一千年會維持高水平。世界會非常溫暖，溽熱難熬。

大家想一想，是時候行動了嗎？

李本澄  
2009年6月16日

same result, except that the picture looks even worse-carbon dioxide levels would remain elevated 1000 years into the future. Welcome to very warm, sizzling world.

So, is it time to act?

B Y Lee  
16 June 2009



# 勇者無懼

## Heading into the storm

當年今月，盟軍反攻諾曼第，至今仍為世人紀念。事實上，香港天文台過去亦有不少英勇故事，可堪回味。時間是1941年12月8日，一個晴朗的冬日。當年兩名台長助理之一的 G.S.P. Heywood 先生如此記述：

As the world commemorated D-Day this month, the Observatory has its own story of bravery to tell. The time was Monday, 8 December 1941, a fine, wintry day.

“That morning I had enjoyed a tasty breakfast under my own roof, in the afternoon I was a captive in the hands of





圖一：G.S.P. Heywood，1946-1956年台長  
Figure 1: G.S.P. Heywood, Director from 1946 to 1956

「那天早上，我還安在家中享受著美味的早餐，到下午，已淪為日軍的階下囚；世事之變幻無情，莫此為甚。無可奈何之下，我們極可能成為東亞戰事中的首批俘虜……」（註一）

當時Heywood和另一名台長助理L. Starbucks先生受命前往凹頭的天文台地磁站，拆卸及回收站內的儀器。該站位於新界，離天文台約四十公里車程。他們往北走，途經多個哨站，到達時發覺該處已棄守。卻不知其時日軍已越過邊界，

the Japanese; it was certainly a rude and sudden change, and we thought it likely that we had the unenviable distinction of being the very first prisoners to be taken in the war of East Asia. ...." (Note 1)

Thus wrote G.S.P. Heywood, one of the Director's two assistants at the time. Together with the other assistant, L. Starbucks, they were instructed to dismantle the Observatory's magnetic station at Au Tau and retrieve the equipment there. The place was in the New Territories some 40 kilometres from the Observatory by road. Thus they headed north, passed pickets and found the place deserted-just as the enemy

向南推進。

他們就在當地被日軍俘虜，與當時的天文台台長伊雲士（B.D. Evans）一起渡過將近四年的囚禁生涯。重見天日時，恍若隔世。

天文台不乏其他英勇事跡。1983年颱風愛倫正面吹襲香港。兩名駐守赤鱗角臨時氣象站的觀測員，梁嘉文和伍德良，在暴風中堅持天氣觀測工作，直至該站幾乎夷為平地。下圖可見，兩人當時站在滿目瘡痍的氣象站前，等候直昇機救援的情況。

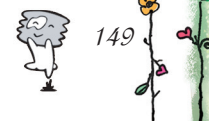
此外，亦有一隊默默耕耘的無名英雄，每當風球發出、市民紛紛回家之際，他們卻要趕忙上山，進駐天文台的天氣雷達站。他們是「雷達機械師」，負責確保雷達在打風期間正常運作，不斷監測暴風雨。他們要在站內駐守直至風暴過去，往往一住數天。若山路受阻或斜坡倒塌，則可能要

advanced south from across the border.

There they were captured and spent the next nearly four years in internment together with the then Director, B.D. Evans. It was another world when they emerged from confinement.

There is no lack of courageous acts in the history of the Observatory. During the direct hit by Typhoon Ellen in 1983, two observers, Messrs Leung Kar-man and Ng Tak-leung, persevered with their weather observation at Chek Lap Kok till the temporary weather station there was practically blown down. The photograph below shows the observers standing in front of what was left of the battered station before they were airlifted to safety.

There are silent heroes too. Just as the public go home when tropical cyclone signals are issued, these people head for the hills where the Observatory's weather radar are installed. They are the Radar Specialist Mechanics, charged with ensuring uninterrupted running of the radar which are extremely important for the monitoring of severe storms. There they will stay till the storm is away, usually for a couple of days, and longer if





圖二  
Figure 2

逗留更長時間。他們暫別家人，直赴前線，對抗風雨，值得我們衷心致敬。

憑藉天文台同事的優良傳統，我深信這種精神將永遠延續下去。

李本澄  
2009年6月26日

there is no relief because of blocked roads or failed slopes. They leave the comfort of home and family for the frontline and face ravaging winds and rain. For this, they deserve our every respect.

Knowing Observatory colleagues, I am sure the spirit will live on.

B Y Lee  
26 June 2009

註一：摘錄自Heywood先生的文章。蒙Heywood先生的家人允准，該文已輯錄在天文台2008年出版的「風雨人間」文集內。

Note 1: an excerpt from Mr Heywood's article, published with permission of the Heywood family by the Hong Kong Observatory in the book "Weathering the Storms", 2008.



## 天氣災害 (二)

### Weather hazards 2

在上一個關於天氣災害的網誌，我們討論了熱帶氣旋和暴雨。長期居港的人均對這兩樣災害有一定認識。但其實還有其他較不為人注意的天氣災害，同樣可以致命。

In a previous blog on weather hazards, we talked about the dangers of tropical cyclones and rainstorms. These are obvious to people who live in Hong Kong long enough. However, there are other less obvious weather hazards which nonetheless can kill.







我說的是陰天時雷暴所帶來的閃電和強風，以及晴天時的中暑。

## 閃電

圖一顯示香港近年與閃電有關的傷亡數字。

1990至2008年間共有三十九人傷亡，包括六人死亡（平均每年0.3人）。

為加強這方面的安全，天文台在2005年裝置了一套閃電定位系統，在互聯網及「打電

I am referring to lightning and high winds brought about by thunderstorms when the sky is gloomy, and to heat strokes when the sky is clear.

## Lightning

Figure 1 below presents the casualty figures associated with lightning in Hong Kong in recent years.

There were 39 casualties during the period from 1990 to 2008, including 6 deaths (or 0.3 death per year).

To enhance safety in this aspect, the Observatory implemented a lightning location system in 2005. Various products of lightning information are available on

話問天氣」系統為市民提供各項閃電資訊。最近更推出了「指定地點閃電戒備服務」，市民可自選關心的位置，當指定地點某範圍內出現閃電時，網頁會自動發出戒備信號。

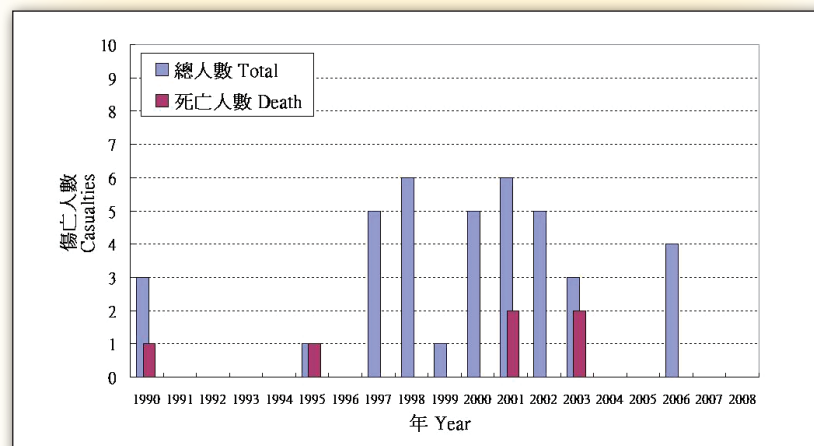
## 雷暴引致的強風

公眾一般認識熱帶氣旋會帶來大風，但往往忽略了雷暴引致的強風的危險。圖二顯示與此相關的傷亡數字（資料來自報章報導）。

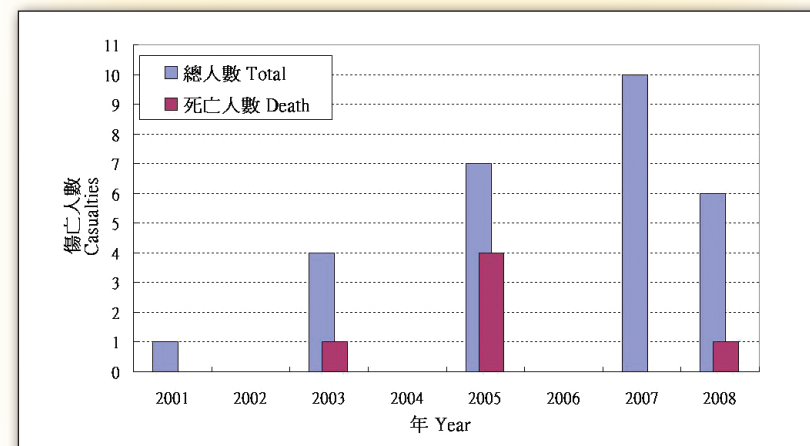
the Observatory website and its automatic telephone answering system. The latest product is a location-specific service which enables an alert to be automatically sent to the user whenever lightning is detected within a specified distance from a location chosen by him/her.

## High winds from thunderstorms

While people know that tropical cyclones can bring windy conditions, the danger of high winds brought about by thunderstorms is often overlooked among the local public. The associated casualty figure as extracted from press reports is given in Figure 2.



圖一：1990年至2008年閃電在香港每年造成的傷亡人數（資料來自報章報導）  
Figure 1: Lightning casualties in Hong Kong, 1990 to 2008 (as extracted from press reports)



圖二：2001年至2008年與雷暴相關的大風在香港每年所造成的傷亡人數（資料來自報章報導）  
Figure 2: Casualties caused by high winds associated with thunderstorms in Hong Kong, 2001 to 2008 (as extracted from press reports)





過去八年共有28人傷亡，直接原因包括船艇翻沉、被塌下的樹木、貨櫃箱、招牌、窗戶或棚架擊中等。其中有六人死亡，即平均每年0.8人死亡，比閃電引致為多。

要準確預測雷暴引致的陣風相當困難。為了提高市民的警覺，天文台在互聯網及「打電話問天氣」系統上增加了風和陣風的資訊。不過，要減低有關的傷亡，市民必須注意有關安全措施。在雷暴警告生效時，工人、承建商和工程師等必須確保戶外設施及器械已被綁緊或適當處理。

## 中暑

幾乎每年都有與中暑有關的傷亡。如圖三所示，雖然紀錄並不長，但摘錄自報章報導的傷亡數字卻相當高：2005至2008年間共有325人中暑或熱暈，包括23人死亡，即平均每年5.8人死亡，是上述兩類天氣

The casualty figure is 28 over the past 8 years, caused by capsized boats/ships, broken trees, and fallen containers, neon signs, windows and scaffolding. The figure includes 6 deaths, or 0.8 death per year which is more than that associated with lightning.

There are inherent difficulties in accurately predicting the gusts from thunderstorms. To heighten alertness, the Observatory has enhanced the wind and gust information and prepared dedicated webpages and automatic answering phone messages to warn people of the high winds.

To mitigate the damaging effect of high winds from thunderstorms, however, it is very important that members of the public are aware of the relevant safety precautions. Operators, contractors, and engineers should also ensure that outdoor structures and machinery are properly secured and attended to by the time the Thunderstorm Warning is issued.

## Heat strokes

Hardly any year goes by without casualties associated with heat strokes. As shown in Figure 3, although the record is not long, the casualty figure (suspected to be suffering from heat-related illnesses) as extracted from press reports is quite

災害的數倍。

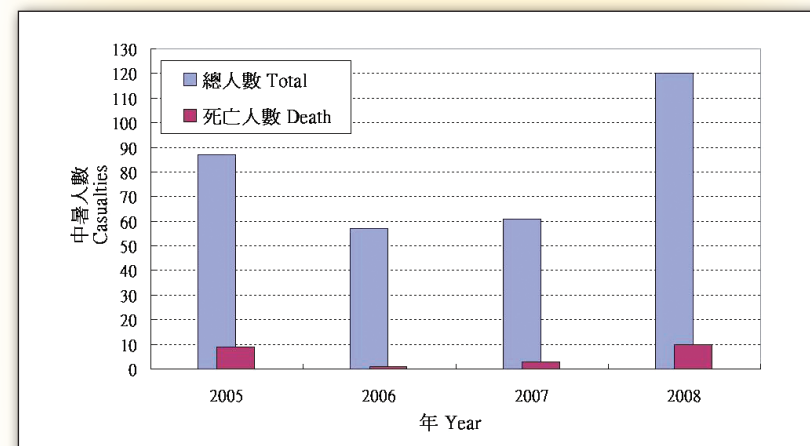
這些事故多數發生在戶外活動人士身上，而他們有些更正值年青力壯，前途無限。

這些報導沒有說明造成傷亡的醫學原因，而中暑的成因很多。在香港，與天氣有關的成因包括高溫、高濕度及風勢微弱。與健康有關的因素包括體能、脫水情況、運動或工作前是否有足夠的休息、及是否長期病患者等。

high: 325 over the period 2005 to 2008, including 23 deaths which amount to 5.8 deaths per year. This is many times the figures for the previous two weather hazards.

A majority of these incidents happened to people engaged in outdoor activities. Some of these people were often young and still in their productive years.

The press reports did not state the medical causes for the casualties. There can be many factors associated with a heat stroke. In Hong Kong, the weather factors can be: high temperature, high humidity, and no wind. Non-weather related factors include physical fitness,



圖三：2005年至2008年每年5月至9月香港中暑的人數（資料來自報章報導）  
Figure 3 : Heatstroke casualties in Hong Kong from May to September, 2005 to 2008 (as extracted from press reports)





令問題更複雜的是，一些事故可能由炎熱天氣觸發，但最終死亡原因可能與天氣無關。雖然如此，但數字本身的確值得關注。

天文台正積極與有關部門及組織合作研究過往的天氣資料進行分析。雖然這項工作頗複雜，但我們希望在未來兩三年發展出一些有用的暑熱壓力資訊，向公眾發放。

期間，市民須留意天文台發出的酷熱天氣警告及分區氣溫資料，並提高警覺在炎熱天氣下保護自己。

戶外工作者須留意勞工處有關指引：<http://www.labour.gov.hk/tc/public/pdf/oh/heat.pdf>

李本澄  
2009年7月13日

state of dehydration, amount of rest prior to exercise or work, pre-existing chronic disease, etc.

What complicates the matter is the fact that some incidences might have been triggered by the heat, but the ultimate death causes were something else, unrelated to weather. Despite this, the casualty figure certainly requires greater attention.

Together with relevant parties, the Observatory is actively studying the matter using available weather data in Hong Kong. The task is not simple, but hopefully some useful heat-stress information can be developed for the public over the next couple of years.

In the meantime, the public is advised to pay attention to the Very Hot Weather Warning as well as the regional temperature information issued by the Observatory, and take extra care in protecting themselves under hot weather.

Outdoor workers should heed the advice of the Labour Department : <http://www.labour.gov.hk/eng/public/oh/heat.pdf>.

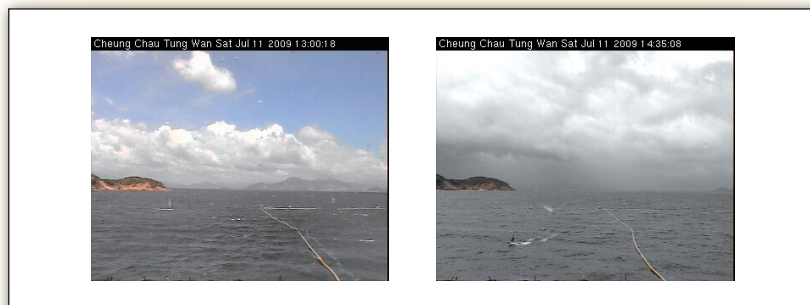
B Y Lee  
13 July 2009



天文台最近在長洲安裝了一部攝影機，以監察附近的天氣和海面情況。以下兩張照片攝於7月11日（星期六）下午，當時熱帶風暴蘇迪羅正迫近香港，熱帶氣旋警告信號經已發出。

The Observatory recently installed a camera at Cheung Chau to monitor the weather and sea conditions there. Here are two photos taken in the afternoon of 11 July (Saturday), when tropical cyclone signals were issued as Tropical Storm Soudelor approached Hong Kong:





圖一  
Figure 1

公眾似乎不太在意天文台因大浪和暗湧而發出的對水上運動的警告。海面出現白頭浪（左圖）表示清勁風力甚至強風，而浪高則達二米。我們從當日看到的片段可見，同一時間曾經最少有十個人在滑浪。

上周末，颱風莫拉菲只差四十公里便正面吹襲本港，但上述情況未見好轉。大概因為星期六下午天氣酷熱，天文台的氣溫升至34度，新界部分地區更高達37度，不少人到海邊消暑。

People seemed to pay little attention to the warning against water sports due to the presence of rough seas and swells. The appearance of white caps on wave top (left picture) means that winds were fresh to strong and the associated wave height could be as high as 2 m. Despite this, over ten surfers could be identified from the camera at one time.

The situation hardly changed last weekend when Typhoon Molave almost scored a direct hit at Hong Kong, missing it by a mere 40 kilometres. Probably because of the extreme heat that afternoon, when temperatures soared to 34 degrees at the Observatory and some 37 degrees in the New Territories, lots of

翌日多份報章均報導這些人在海邊弄潮為樂。登載的相片看似歡樂，但實際情況十分兇險。這些報導顯然無助於政府的呼籲，打風時應遠離岸邊。

根據我們的記錄，過去十年有十二人在打風期間死亡。其中三分之二與水上運動有關：六人當時在游泳或滑浪，一人在釣魚，另外一人為休班消防員，因嘗試拯救一名在大浪中游泳的市民而命送大海。

李本滢  
2009年7月23日

people went to beach braving the waves.

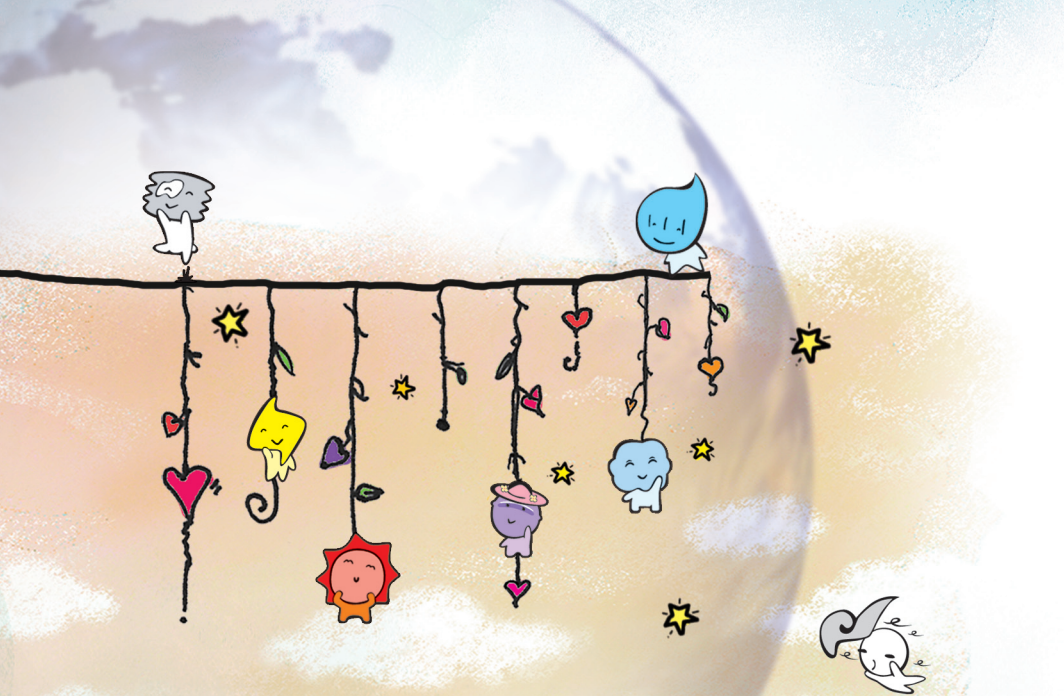
The next day, many newspapers featured these people enjoying at the seaside in their coverage of the storm. The images seemed to suggest fun, but actually they smelled of extreme danger. The coverage certainly does not help the Government's message asking people to stay away from the shore when tropical cyclones strike.

According to our record, twelve people lost their lives during tropical cyclone passages over the past ten years. Of these, 2/3 were associated with water sports: 6 were either engaged in swimming or surfing; one was swept away while fishing; another one, an off-duty fireman, tragically lost his life while attempting to save a swimmer in rough seas.

B Y Lee  
23 July 2009







# 端午節的氣候

## Dragon Boat Festival climate

一位見解獨到的讀者對我5月25日的網誌提出疑問。大致上，他質疑既然端午節的日期每年均有差異，我們是否可確定端午節期間的氣溫有上升趨勢。

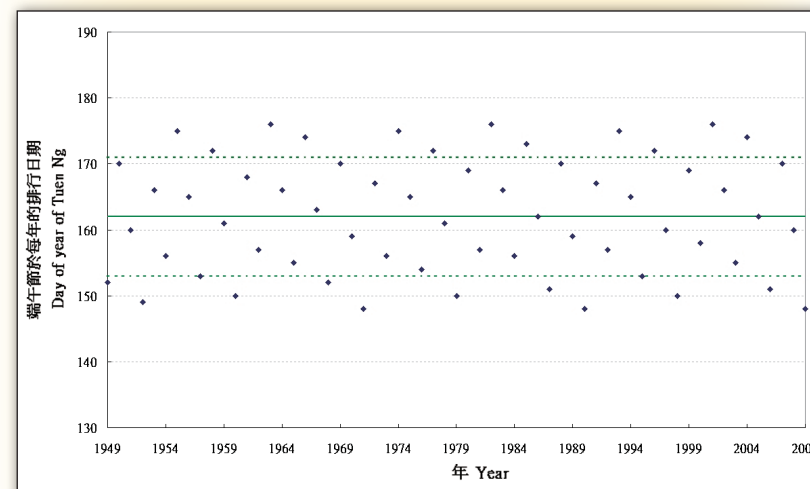
An insightful reader queried about the blog released on 25 May 2009. In essence, he questions that since Tuen Ng (Dragon Boat day) tends to vary from year to year, whether a warming trend could indeed be identified for the period around Tuen Ng.

中國的曆法是「陰陽曆」，並非我們現在常用的、以太陽運動為本的公曆。中國曆每隔兩三年便有一個閏月。因此，在公曆上，中國節日如端午節的日期每年均有所變化。

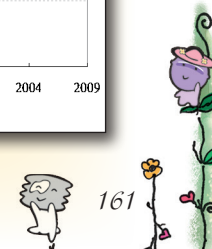
圖一顯示每年端午節的日期。可以見到，儘管每年的日期不同，但亦有規律可尋。若以每十年計（按照5月25日網誌的計算方法），在過去六十年端午節的平均日期及變化如下：

The Chinese calendar is a lunisolar calendar, not a purely solar one like the Gregorian calendar we commonly use nowadays. The date of a Chinese festival like Tuen Ng tends to change from year to year with the addition of a leap month every two to three years.

Figure 1 shows the dates of Tuen Ng over the years. One can see that even though the day of the festival varies from year to year, there is a degree of regularity to the pattern. If one computes the mean date over 10-year periods (as used in the 25 May blog) and its variation over the past 60 years, one finds the following:



圖一  
Figure 1





表一 Table 1

| 年<br>Year | 端午節的平均日期（以一月一日為 '1' ）<br>Mean day of year for Tuen Ng<br>(from 1 January) | 標準差（日）<br>Standard<br>deviation (days) |
|-----------|---------------------------------------------------------------------------|----------------------------------------|
| 1949-1958 | 161.8                                                                     | 9.1                                    |
| 1959-1968 | 162.2                                                                     | 8.9                                    |
| 1969-1978 | 162.7                                                                     | 8.6                                    |
| 1979-1988 | 163.0                                                                     | 9.2                                    |
| 1989-1998 | 160.6                                                                     | 9.1                                    |
| 1999-2008 | 164.1                                                                     | 8.3                                    |

從表一可見，端午節的十年平均日期變化不大－介乎第160至164日。而十年間的變化（統計學上的「標準差」）約為9日。

再談端午節的氣候。在5月25日的網誌，我們計算了在端午節及之前六日期間，屬於「舒適晚上」（網誌上定義為天文台錄得的最低氣溫在25度或以下）的日數，發現該數字在1979至2008年的三十年間有下降的趨勢。因此，我們說本地的天氣愈來愈暖。

不過，端午節過後這位讀者正確指出了本年端午節期

It can be seen from Table 1 that the mean day of Tuen Ng in each of the 10-year periods changes quite little - between day 160 and 164. Its variation (standard deviation in statistical term) is about 9 days.

Now back to the discussion of the climate for Tuen Ng. In the 25 May blog, we counted the number of 'comfortable nights' (defined in the blog as those having a minimum of 25 degrees Celsius or below at the Hong Kong Observatory) over the 7-day period ending on Tuen Ng and identified a decreasing trend in the number of such nights over the three 10-year periods from 1979 to 2008. Thus, we said the local weather has become warmer and warmer.

However, with the benefit of



間，由於天氣較涼，共有六個「舒適晚上」。但這是否與上述的暖化趨勢相悖？若將所有的十年期推遲一年，從而將2009年包括在內，我們會得出以下結果：

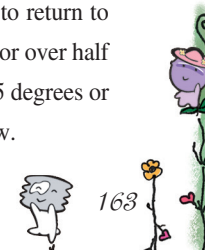
表二 Table 2

| 年<br>Year | 端午節及之前六日<br>7-day periods ending on Tuen Ng                            |                   |
|-----------|------------------------------------------------------------------------|-------------------|
|           | 最低氣溫在25.0 °C 或以下的日數<br>Number of days with minimum of 25.0 °C or below | 百分比<br>Percentage |
|           |                                                                        |                   |
| 1950-1959 | 38                                                                     | 54%               |
| 1960-1969 | 34                                                                     | 49%               |
| 1970-1979 | 25                                                                     | 36%               |
| 1980-1989 | 32                                                                     | 46%               |
| 1990-1999 | 22                                                                     | 31%               |
| 2000-2009 | 26                                                                     | 37%               |

的確，從表二可見，2000至2009年十年間的「舒適晚上」日數沒有下降，反而有輕微上升。這是否表示有降溫趨勢？答案是否定的。表二的數字仍顯示一個普遍下降趨勢，雖然並非單向的下降。而過去有一半或以上的晚上屬於舒適的情況，將一去不返，理由如下。

hindsight the reader correctly points out that because of cooler weather, the Tuen Ng in 2009 had six comfortable nights out of the 7-day period. Would that upset the warming trend? Here are the results after shifting all 10-year periods forward by one year to cover 2009:

Indeed, from Table 2, the number of comfortable nights during 2000-2009 did not fall and as a matter of fact, rose a little compared with the previous decade. Does this mean a reversal of the warning trend? The answer is no. The numbers in the table still indicate a general declining trend, even though it is not a monotonic fall. And things are not going to return to those good old days where half or over half of the number of nights were 25 degrees or less, for the reasons given below.







在過去數十年，本地氣溫每十年上升0.2度。我們按照「政府間氣候變化委員會」的結論推算，假如我們現在的生活方式不變，這個暖化趨勢將會持續。

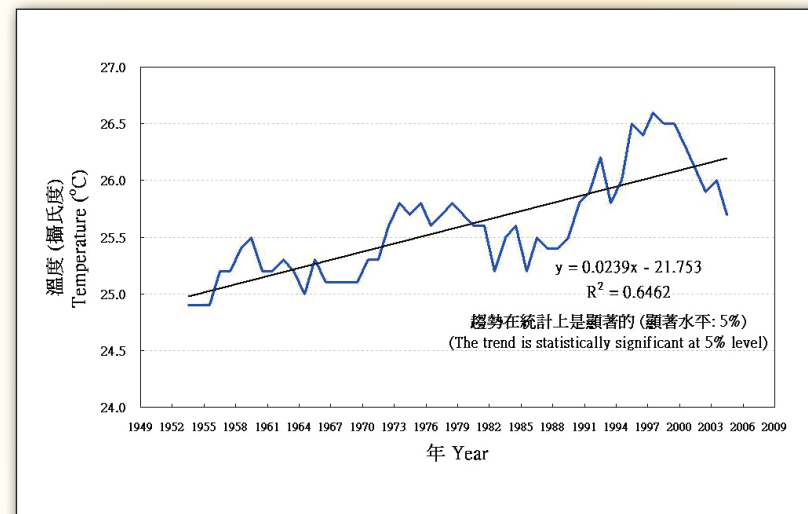
圖二顯示1949至2009年，端午節及之前六日期間的最低氣溫的十年移動平均值。計算移動平均值的目的是濾去短期的上落，凸顯長期變化。圖二可見，平均最低氣溫的上升趨勢十分明顯：在過去六十年上升了1.4度。〔統計學的說法是每十年上升0.24度，顯著水平為5%。〕

李本澄  
2009年8月12日

Separate calculations indicate that local temperatures in recent decades have been rising at a rate of 0.2 degrees per decade. Our projection based on results of the Intergovernmental Panel on Climate Change (IPCC) is that such a warming trend will continue unabated if there is no basic change to our current lifestyle.

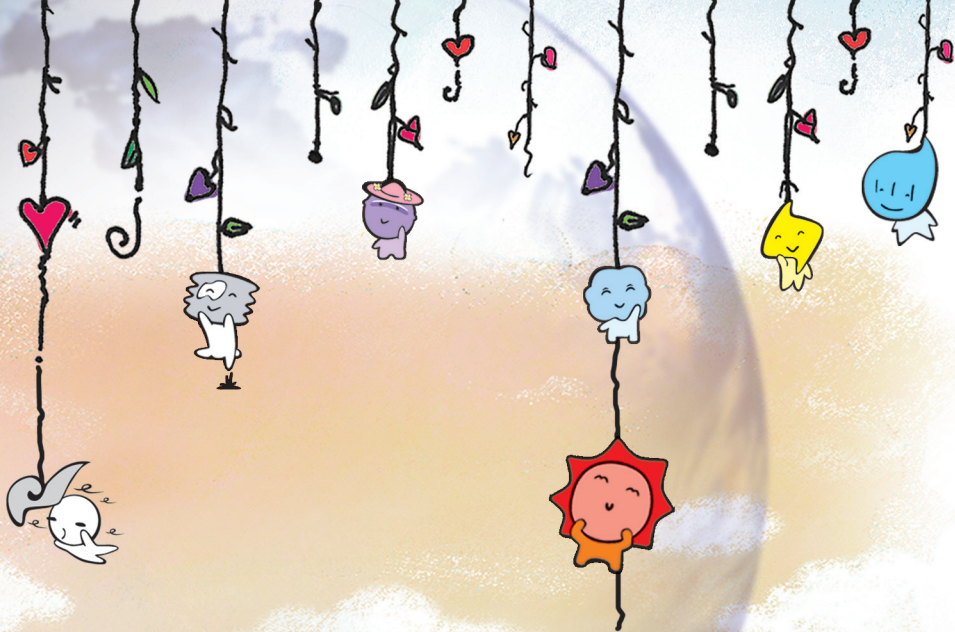
In terms of the minimum temperature for the 7-day period ending on Tuen Ng, the graph below plots 10-year running mean of the minimum temperature, from 1949 to 2009. The use of running mean is to remove short-term fluctuations to bring out long-term changes. From Figure 2, the rising trend in the average minimum temperature is evident: 1.4 degrees over the past 60 years. [In statistical terms, the increase is at a rate of 0.24 degrees per decade, at 5% significance.]

B Y Lee  
12 August 2009



圖二：端午節及前六天平均最低氣溫的每十年移動平均值  
Figure 2: Running 10-year average 7-day mean minimum temperature ending Tuen Ng.





# 天氣圖小史

## History on weather map

前菲律賓總統阿基諾夫人本月一日的離世，讓我想起二十年前在天文台的一次夜班。

時間是1986年2月24日，菲律賓革命（又名「人民力量革命」）的前夕。我從新聞報導

The passing away of Mrs Corazon Aquino, ex-President of the Philippines, on 1 August reminds me of a night shift at the Observatory more than 20 years ago.

It was 24 February 1986, a day before the Philippine Revolution (the 'People Power Revolution'). I heard about the event's build-up on the news as tension

知道菲律賓的局勢發展，氣氛漸趨緊張。

當晚香港的天氣卻頗為平靜。東北季候風帶來一絲涼意，氣溫約十五度。

作為預報員，我的工作包括分析天氣圖。其中一款天氣圖包含亞洲區的地面觀測，提供每隔三小時最新天氣報告。這些資料由多處地方提供，包括菲律賓約二十個觀測站。

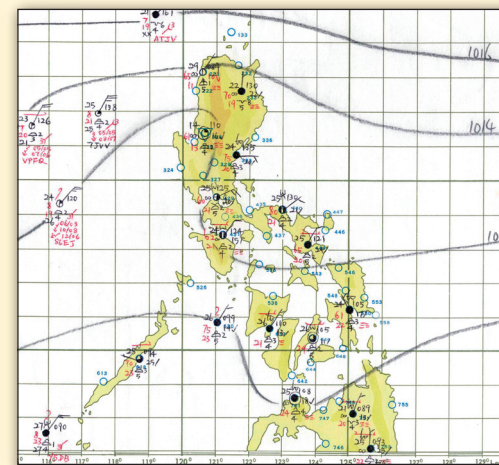
當晚開始時，來自菲律賓的觀測資料還很正常，差不多所有站均有匯報（圖一）。但

in the Philippines continued to mount the previous few days.

Weather-wise, it was uneventful in Hong Kong that night, with a northeast monsoon bringing a cool 15 degrees Celsius.

As a weather forecaster, my duties covered the analysis of weather charts. One such chart came in every 3 hours, carrying surface observations made in this part of the world. These observations included those from nearly 20 stations in the Philippines.

The Filipino observations were quite normal at the start of the night shift, with practically all stations reporting (Figure 1). Then they started to decrease near



圖一：1986年2月24日下午8時  
Figure 1 : 8 p.m., 24 Feb 1986





午夜左右這些資料開始減少，到清晨更形疏落。上午8時，本是全球氣象觀測的主要時間，但當天（25日）天氣圖上整個菲律賓僅顯示馬尼拉的資料（圖二）。我自忖，那邊的局勢一定很嚴重了。

我後來發覺，25日整天的情況並沒有改善 – 馬尼拉的觀測是僅有的資料。新聞報導，當天早上阿基諾夫人正式就任總統，而前總統馬可斯則於當晚匆忙離國，前往美國。

從天氣圖可見，局勢很快回復正常。翌日（26日）所有菲律賓的觀測站均恢復提供觀測資料了。

可以理解，當一個地方發生重大事故時，我們每每可從天氣圖看到端倪。

另一個例子是1948年12月的一幅天氣圖（圖三）。該圖在天文台總部常設展出，供訪客觀賞。當時中國內戰正酣，

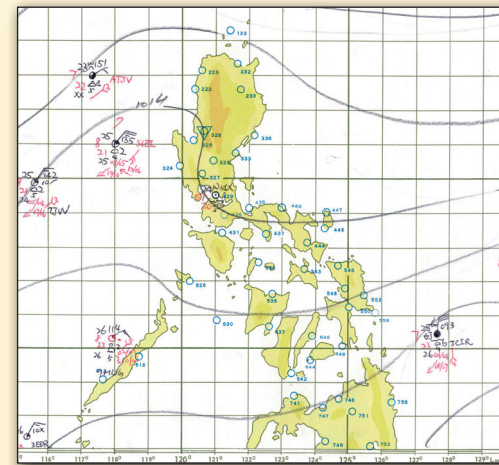
midnight, and were down to a trickle in the small hours. By 8 a.m. (25 February), a major hour for meteorologists all over the world, the weather chart showed only the observation from Manila for the entire Philippines (Figure 2). I told myself things must be pretty serious there.

The situation did not improve that day, as I later found out - only observations from Manila were available. The news came out that Mrs Corazon Aquino was inaugurated as the President that morning, while the former President, Mr Ferdinand Marcos, left the Philippines for the United States the same evening.

As evident on the weather chart, things quickly returned to normal the following day (26 February), with all stations reporting.

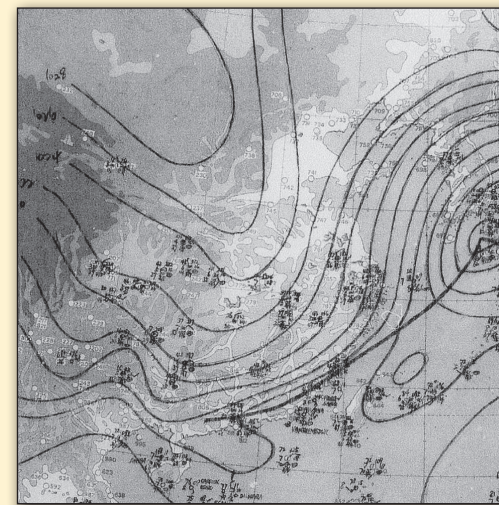
So, in a way, the weather chart does have a story to tell when it comes to a big event affecting practically everyone in a place.

Another example involves a weather map for December 1948, which is constantly on display at the Observatory (Figure 3). It was at the height of the Chinese Civil War, with the People's Liberation Army already controlling



圖二：1986年2月25日上午8時，只有馬尼拉（站號429）提供天氣報告。圖中其他觀測為船舶報告。

Figure 2 : 8 a.m., 25 Feb 1986. Only Manila (station no. 429) was reporting. The rest were ship reports.



圖三：1948年12月31日  
Figure 3 : 31 December 1948



解放軍已控制了中國東和北部地區。該天氣圖顯示，雖然北部的天氣觀測已全部停止，但中部及南方，長江以南仍然有為數不少的天氣報告。

1949年內戰結束，中華人民共和國成立。之後天氣觀測網絡迅速重建及擴展，到1950年代末已達世界水平。

李本澄  
2009年8月18日

the northern and eastern parts of China. The map showed that while weather reports were non-existent in the north, observations were still being made at a number of stations in central and southern China (near the Yangtze River and to its south).

The war ended in 1949 with the establishment of the People's Republic of China that year. Thereafter, the weather network was quickly re-built and further expanded. It attained world-class level by the late 1950s.

B Y Lee  
18 August 2009



多謝各位支持。今年至八月為止，天文台互聯網站的瀏覽次數已超過十一億次。這個數字在數年前是難以想像的。

同樣難以想像的，是網站內的「時間服務」網頁高踞八月份最受歡迎網頁之首，瀏覽

Thank you for the support from every one of you. The page visits at the Observatory website top 1.1 billion up to August this year. This is something unimaginable a few years back.

As I look at the August figures for the most popular pages in the website, equally unimaginable is the fact the







次數達四千萬次。這當然是因為用戶能夠很容易設定他們的電腦，鍵盤上三數下便能不斷自動與天文台原子鐘對時。天文台的原子鐘是全球約三百個用作校訂「協調世界時」（Coordinated Universal Time, 簡稱UTC）的原子鐘之一。多年來，我們的鐘亦準確無誤地為電台提供大家所熟悉的六下報時信號。

位列第二的是「天氣報告」網頁，八月份的瀏覽次數超過二千七百萬次。該頁提供最新氣溫、濕度、雨量及紫外線指數等。鑒於這些資料深受市民關注，天文台於2007年推出「一區一站」計劃，務求在全港十八區每區最少有一個氣溫自動站。在推行這計劃時我們得到各區區議會和其他政府部門的通力合作，而「天文台之友」等用戶亦提供了意見。我們預計在未來一兩年裝設餘

'Time service' tops the list, with over 40 million visits in a month. The popularity, of course, can be attributed to the ease with which users set up their computers to receive synchronization signals from our atomic clock. This only requires a few clicks. You probably are aware that the Observatory's clock forms part of some 300 clocks around the world contributing to the determination of the Coordinated Universal Time (UTC). It also faithfully gives the familiar 6-pip time signals on the radio for many, many years.

Second on the list is 'Current weather', with over 27 million visits in August. It gives the latest temperature readings together with other information such as humidity, rainfall and UV (ultraviolet radiation) index. In view of its popularity, the Observatory embarked on a 'One district one station' programme in 2007, with a view to ensuring at least one temperature station in each of the 18 districts in Hong Kong. The programme has been carried out in collaboration with the district councils and government departments, as well as in consultation with users such as the Friends of the Observatory. It will be completed with the

下兩個自動站，整個計劃便完成。

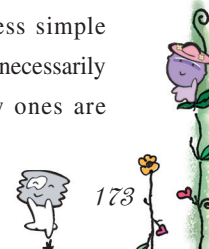
接著是「現時生效警告」和「熱帶氣旋位置及路徑圖」網頁，各有約一千萬瀏覽次數。很明顯，這兩個網頁的用戶十分關心惡劣天氣如颱風的移動、發展和對香港的影響等。為此，我們近年來繼續改善暴雨和熱帶氣旋的預測。不過，以顏色和數字分別代表的暴雨和熱帶氣旋警告始終不能滿足所有人的資訊需要。因此我們開發了多項產品，以幫助不同用戶因應各自的情況作出決定。

值得一提的是「教育資源」網頁。這網頁在幾年前開始建立，同事們就不同的科技題材撰寫文章。一些簡單科學問題的答案殊不簡單，同事們會嘗試以淺白文字解答。我們每季都會加入新文章，至今已累積了數百篇。該網頁每月吸

implementation of two remaining stations within this couple of years.

Then come the 'Weather warnings in force' and 'Tropical cyclone track and position', each receiving about 10 million hits. Users of these webpages are obviously concerned at how severe weather including typhoons moves, develops and impacts on Hong Kong. For this, we continued to improve our rainstorm and tropical cyclone forecasting in recent years. However, the colour and number systems, for rainstorm and tropical cyclone warnings respectively, are unlikely to satisfy the information needs of everybody as it is difficult to have one colour or number that fits all. We therefore have developed a number of products to aid users in their decision making.

One webpage that's worth mentioning is 'Educational resources'. Started a few years ago, it consists of articles prepared by Observatory colleagues on various topics that deal with science and technology. Written in layman terms, the articles attempt to address simple scientific questions that do not necessarily entail simple answers. New ones are





引超過一百萬瀏覽次數，相當可觀。我深信大家每次進入該網頁都有所得。(http://www.weather.gov.hk/education/educ.htm)。

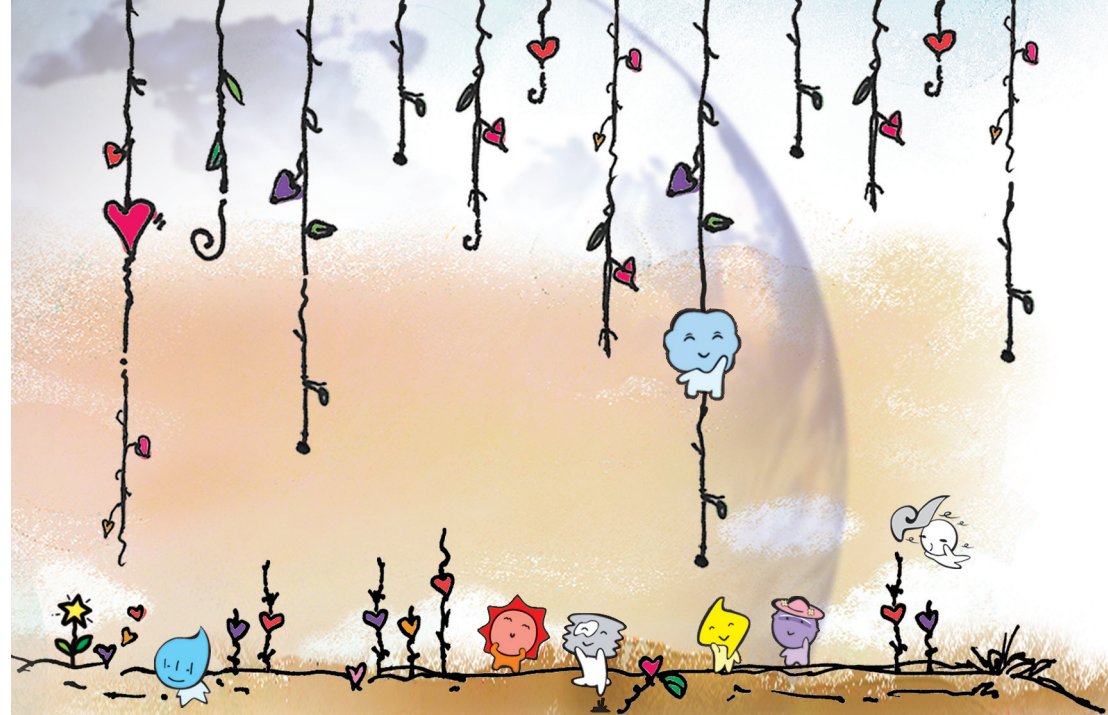
我們歡迎你提建議，可發電郵至mailbox@hko.gov.hk。

李本澄  
2009年9月7日

added every quarter so much so that the website now contains hundreds of articles. It is now attracting over 1 million visits per month-quite an amazing figure. I am sure visitors would find something new or useful each time (www.weather.gov.hk/education/educ.htm).

We welcome your suggestions.  
Write to us at mailbox@hko.gov.hk.

B Y Lee  
7 September 2009

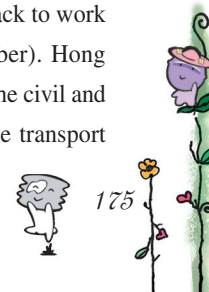


## 無懼風雨，同心為民

### *Acts of courage*

雖然颱風巨爵為香港帶來破壞，但整體社會很快恢復正常運作。傳媒報導，在風暴期間有大約五十人受傷，但翌日（9月15日）早上，恢復上班並無出現意外。香港人應為身在文明有序的社會而感到驕傲。

Despite the havoc wrecked by Typhoon Koppu, Hong Kong quickly returned to normal. While the media reported some 50 casualties mostly incurred at the height of the storm, there was none in the general rush back to work the next morning (15 September). Hong Kong people can take pride in the civil and orderly society they are in. The transport





我們亦要感謝各公共交通機構在風暴期間部署周詳，並且預先通知了公眾有關安排。

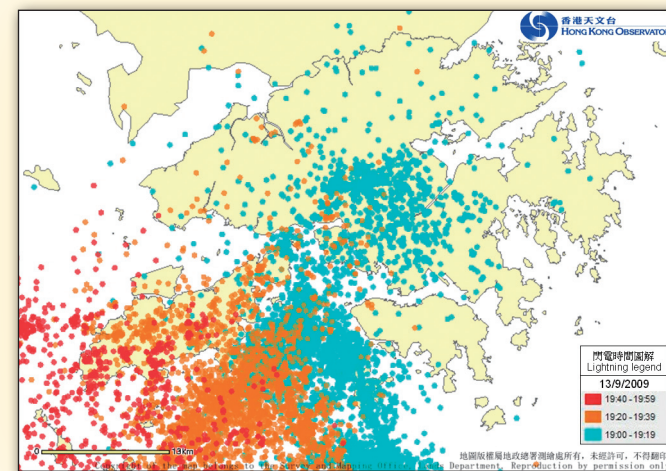
談到預先通知，天文台今次提供了較具體的改掛「風球」的時間，例如在四小時前預告會在早上十時左右將八號風球改為三號風球。另外，經有關部門商討後，前一晚（9月14日）亦於十個鐘頭前以短訊通知了有關各方，低窪地區可能受風暴潮影響。一切總算運作良好。不過，我們未必每次都這樣做，要視乎熱帶氣旋本身動向和發展的情況而定。每個熱帶氣旋均有分別，因此亦要以不同方法處理。

我最想告訴大家的，其實是天文台在颱風來臨前所面對的困難。之前一晚（9月13日），強雷暴摧毀了多個自動氣象站，包括位於長洲的自動站。該站提供寶貴的離岸海域風向和風速資料，對熱帶氣

operators should be congratulated for their immaculate planning and advance notice to members of the public.

Talking about advance notice, the Observatory started giving a specific timing for tropical cyclone signal changes this time, for instance by stating 4 hours ahead that the No. 8 signal would be replaced by No. 3 at about 10 a.m. The previous evening, SMS messages on the storm surge warning for low-lying areas were sent to relevant parties 10 hours ahead. These seemed to work well. However, such practice is not guaranteed, as it depends very much on the behaviour of the storm in respect of its movement and development. Each storm is different, and therefore needs to be handled differently.

What I really want to talk about is the difficulties the Observatory faced prior to the storm's approach. Thunderstorms in the previous evening (13 September) knocked out several weather stations, including the station at Cheung Chau which as an offshore island provides valuable wind information and is key to the operation of the Tropical Cyclone Warnings. Although the station has two



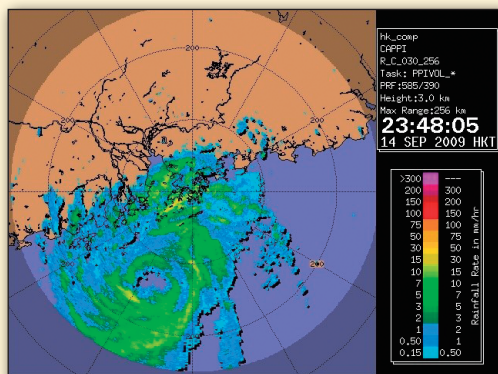
圖一：2009年9月13日黃昏閃電位置分佈圖  
Figure 1: lightning map, evening of 13 September 2009

旋警告的運作具關鍵作用。雖然該站有兩套量度風向風速的儀器（其一為後備），但受到特強雷暴影響（一小時內錄得6000次閃電），兩套儀器同告失靈。

由於情況緊急，第二天一早天文台的同事立即前往長洲搶修。他們深知「巨爵」迫近，時間無多。幾經努力，終於令風速儀回復正常，但要修復風向儀必須由特別技工攀上

wind sensors, one of which serves as a standby, both went out of action because of the thunderstorms' severity (6000 lightning strokes detected in an hour).

In view of the urgency, Observatory colleagues headed off to Cheung Chau first time the next morning (14 September). They knew that time was not on their side as Koppu was moving in. After some effort, the wind speed sensor at the station was restored to normal. However, repair of the wind direction sensor was not possible as it required rigger service, which was not immediately



圖二：2009年9月14日午夜前天氣雷達圖顯示巨鯨的眼  
Figure 2 : radar picture showing the eye of Koppu shortly before midnight, 14 September 2009

桅杆更換零件，急切間無法安排。因此我們決定讓同事在天氣轉壞及渡輪停航前回程，再作打算。

風速資料是恢復了，但對於市民制定防風措施甚具參考價值的風向資料卻仍付闕如。我們立時想到的對策是，向市民提供位於長洲泳灘、不久前才安裝好的後備站的風向風速資料。同事們以驚人的速度完成任務，只用了數小時便將後備站的資料上載至互聯網：

available. It was thus decided that our staff should return before the suspension of ferry service and onset of stormy weather.

Despite restoration of wind speed information, the station would go without wind direction information, which was very important to the public when it came to seeking protection from the full force of the typhoon. It then came to our mind that the next logical step would be to let people have the wind information from the back-up station, established on Cheung Chau beach not long ago. This was achieved at an amazing speed, and in a matter of hours the information became available on the Internet :

[http://www.weather.gov.hk/wxinfo/ts/index\\_wind\\_c.htm](http://www.weather.gov.hk/wxinfo/ts/index_wind_c.htm)

對熟悉電子和資訊科技的人來說，要完成以上兩項工作殊不容易。然而，同事們只花半天時間便完成了，將長洲風資料的中斷時間減至最低。謹向克盡厥職的同事致敬。

我們也應該表揚提供所有緊急服務的人員。當大部分市民安在家中之際，他們卻不辭勞苦，冒著狂風暴雨執行其職務——救急扶危、在庇護中心當值、疏散災民、清理道路和塌下的樹木以確保第二天早上交通暢順等，值得我們衷心致謝。

李本澄  
2009年9月22日

[http://www.weather.gov.hk/wxinfo/ts/index\\_wind\\_e.htm](http://www.weather.gov.hk/wxinfo/ts/index_wind_e.htm)

For those familiar with electronics and IT, both tasks were no small feat. Nonetheless, they were accomplished in half a day. This ensured that disruption to the flow of wind information at Cheung Chau to the public was kept to a minimum. I salute these dedicated colleagues.

I should also mention the emergency service personnel who tirelessly saved people, manned public shelters, carried out evacuation, and cleared the roads and fallen trees in time for the next morning's traffic - all these at the height of the storm when most of the population was safely at home. It is time that we express appreciation to these courageous people.

B Y Lee  
22 September 2009







# 糖的故事

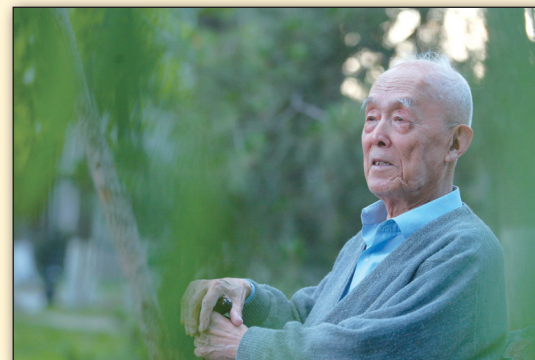
## The story of sugar

在咖啡旁邊的小糖包，令我想起在七月去世的偉大學者季羨林的著作——中國的糖史。

所謂「糖」，一般是指「蔗糖」。結晶糖於印度笈多皇朝的年代（約公元350年）或之前早已出現。相對於甘蔗，

The little packet beside the coffee reminds me of the history of sugar in China written by Ji Xian-lin, a great Chinese scholar who passed away in July.

By sugar we mean cane sugar. Crystalline sugar was first discovered in India a long time ago, before or during the Gupta dynasty (around 350 A.D.). Compared to sugarcane, a big advantage



圖一：偉大學者季羨林（相片由香港電台提供）

Figure 1: Great scholar, Ji Xian-lin (Courtesy of Radio Television Hong Kong)

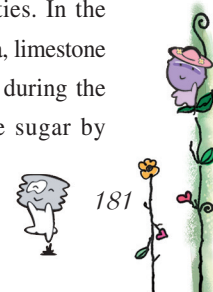
結晶糖的優點是方便儲藏及運送。生產結晶糖的方法約於公元600年傳到波斯（現今伊朗），然後隨著伊斯蘭的崛起傳播至阿拉伯。

結晶糖是怎樣製造的？首先將甘蔗壓成汁，然後將蔗汁煮沸，撇除浮起的渣滓。餘下蔗汁冷卻後，濾去水份，經過弄乾便變成紫黑色的砂糖。深色是與雜質有關，煉糖的目的就是除去雜質。印度煉糖的歷史上，在煮熱的過程中加入不同物質，包括灰或石灰，以沉澱方法去除雜質。亦有利用牛

of crystalline sugar is that it is easy to store and to transport. The method to produce crystalline sugar spread to Persia (now Iran) in around year 600, and later on to Arabia with the advent of Muslim.

How was crystalline sugar produced? Sugarcane was first crushed to give juice. The juice was then boiled, and the scum that rose to the surface was skimmed off. The sediment was allowed to cool, drain and dry, resulting in granulated crystals which was purplish black in colour.

The dark colour of the sugar is associated with impurities. Sugar refining means the removal of impurities. In the history of sugar refining in India, limestone and ash were variously added during the heating process to purify the sugar by





奶、椰漿或麵粉，產生凝結或變稠。去除雜質後，得出的砂糖帶有棕色或黃色。

除了南部部分地區，甘蔗在中國並不普遍。砂糖跟隨佛教以同一路線從印度傳入中國。糖於中國極具吸引力，唐太宗李世民（公元599-649年）派遣工匠到印度學習熬糖法。此後數百年，中國採用近似上述的技術煉糖，期間亦有用雞蛋和鴨蛋作為一種有效的凝結劑，達到淨化糖的更高水平。

第八世紀開始的阿拉伯農業改革中，發現了利用樹木燃燒後產生的灰，能生產更純淨更淺色的糖，然而製成品仍未達到純白的程度。馬可勃羅的遊記中，提及這技術於元朝（十三世紀）傳入中國。

中國的煉糖技術在十六世紀出現突破。在無意中發現原來黃泥水可以把糖淨化至純白勝雪。新的技術令中國能夠在

precipitation. Milk, coconut juice and flour were also used whereby impurities were removed through coagulation or thickening. The outcome was sugar with a brownish or yellowish tint.

Except for some parts in the south, sugarcane was not common in China. Refined sugar was brought in from India along the same route as Buddhism. China was so impressed that in the 7th century, the second emperor of the Tang dynasty, Li Shimin, sent craftsmen to India to learn the way to refine sugar. For hundreds of years thereafter, China adopted similar techniques described above to refine sugar, but in the meantime the use of eggs, a good coagulator, seemed to bring sugar purity to a higher level.

During the Arab Agricultural Revolution which started in the 8th century, it was discovered that the use of ash from burnt trees was very effective in producing sugar with an even lighter colour, though not exactly white. The technique was brought to China by the time of the Yuan dynasty (13th century), as reported by Marco Polo in his travel log.

A breakthrough in sugar refining in China occurred during the 16th century when it was inadvertently discovered that

明末（十七世紀初）透過東印度公司出口白糖至歐洲。

有位化學界的朋友指出黃泥水的淨化效果來自黏土的特性，不過這個論說有待實驗來証實。

這個故事餘下部分，比較多人知悉。十八世紀末西方社會工業化以後，糖已經由大型的煉糖廠生產。現代的技術是採用石灰水及二氧化碳（或磷酸）產生沉澱去除雜質。可見現今採用的化學程序跟古法並沒有多大分別。

雖然並不符合“科學”一詞現代的意思，糖的歷史告訴我們煉糖的發展確實包含了很多實驗、技術及經驗實踐。

李本澄

2009年10月2日

mudwater was capable of producing pure white sugar - so much so that by the end of the Ming dynasty (early 17th century) sugar was exported to Europe through the East India Company.

A friend of mine in the chemistry field tells me that the purification effect probably comes from the clay particles in mudwater, which have good adhesion property. However, this has to be confirmed through experiment.

The rest of the story, of course, is 'history'. With the advent of industrialization in the west which started in the late 18th century, sugar has since been produced in large-scale refineries. Nowadays sugar is refined by the use of limewater and carbon dioxide (or phosphoric acid) which removes impurities by precipitation. As you can see, the chemical process is not much different from the old.

Though not scientific in the modern sense of the word, the history of sugar does tell us quite a lot about the experimentation, empiricism and technology involved in the development of sugar refining.



B Y Lee  
2 October 2009







# 香港未來的雨量

## Hong Kong's future rainfall

上星期，我在香港舉行的第二屆全球氣候變化會議上演講，談到氣候變化及其對香港的影響。現在和大家分享當中有關本世紀內香港雨量推測的部分。

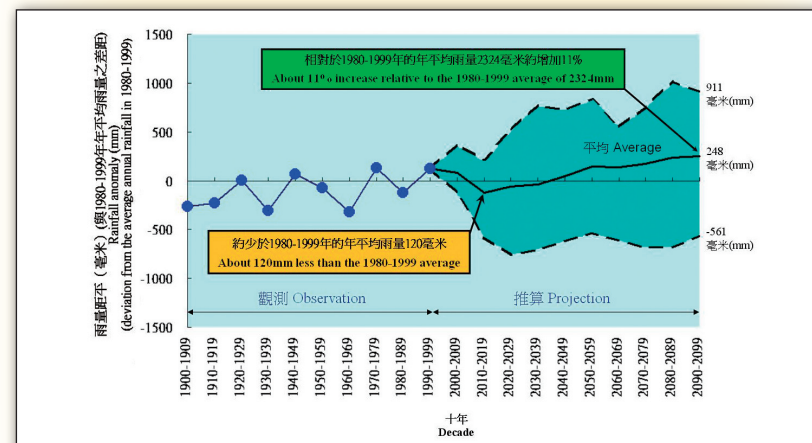
I gave a speech on climate change and its effects on Hong Kong in last week's International Conference on Climate Change 2009 held in Hong Kong. This is to share with you the part regarding the projected rainfall for Hong Kong for the rest of the century.

下圖顯示我的同事最近發表、根據2007年聯合國政府間氣候變化委員會第四次評估報告所得的結果。簡言之，至本世紀末，本港的年平均雨量預計會上升約百分之十（香港年雨量為2380毫米）。

圖一亦顯示香港雨量的變化會愈來愈大，即是會有更多極端多雨及極端少雨的年份。我相信很多學者、本港科學及工程界正努力研究這方面的影響和在他們各自的範疇需要做些什麼。

The figure below presents results recently published by my colleagues. They have been based on the 4th Assessment Report of the United Nations Intergovernmental Panel on Climate Change (IPCC) in 2007. In essence, the average annual rainfall in Hong Kong is expected to increase by about 10% by the century's end (Hong Kong's yearly rainfall is about 2380mm).

The figure also shows that Hong Kong's rainfall pattern is expected to become more and more variable, meaning that there will be more extremely wet and extremely dry years. I believe by now many academics as well as the local



圖一：香港年雨量過去及未來的變化

Figure 1: Past and projected change in annual rainfall for Hong Kong





我希望大家注意的是，預料在未來幾十年（至2040年代），本港的雨量會減少多達百分之五。華南地區（包括廣東）的情況亦相約。這情況令人關注，因為同期本港和廣東省的用水量將會增加。

眾所周知，香港約七至八成的食水來自廣東。至2020年，香港的食水需求量將由現時的九億五千萬立方米增加至十一億立方米；至2030年更會增至十三億立方米。而廣東省本身的食水需求量亦會隨發展而增加，預料由現時的四百六十億立方米增至2020年的五百二十億立方米。但雨量減少，水從何來？

不幸的是，儘管有良好的意願，我們對食水的節約還不足夠。我們每人每日只飲用幾公升的水，直接用水量約為一百公升。相反，要生產一公斤的布卻要用上10000公升水。

scientific and engineering communities are trying to figure out what the implications are and what needs to be done from their respective purviews.

One thing that I would like to bring your attention to is the predicted rainfall in Hong Kong decrease of up to 5% over the next few decades, till the 2040s. A similar decrease is also expected for south China (including Guangdong). This is of immediate concern, as it is set against projected increases in water consumption both in Hong Kong and in Guangdong.

As you may already be aware, about 70% to 80% of fresh water supply in Hong Kong comes from Guangdong. While Hong Kong's water demand is expected to increase from about 950 to 1100 million cubic metres (mcm) by 2020 and to 1300 mcm by 2030, Guangdong has its own anticipated growth and development which will result in greater water demand, from the present 46 to 52 billion cubic metres (bcm) by 2020. But with less rainfall expected for the period, where will the water come from?

Unfortunately, despite the best intentions saving water in the city is not enough. We drink only a couple of litres

生產我們每日所需的食物要用水2000至5000公升；生產一公斤的牛肉要用15000公升，但生產一公斤的蔬菜則只需2000公升。隨著全球日益富裕，人類食用更多肉類，情況將日趨嚴重。

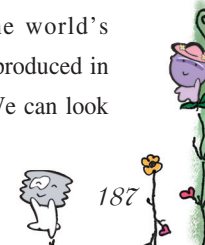
我們可以做什麼呢？一個簡單的答案是想辦法收集更多水。畢竟，我們現在只使用了全球百分之十的降水。收集降水的方法很多，例如建設更多水庫（但可能影響生態），或將水循環再用及海水化淡（但須付出一定成本）。

一個較實際的建議是增加農業用水的效益：現時農業用水佔全球用水的百分之七十五。有些發展中國家的種植用水相當於已發展國家的兩倍。棉花是一種非常嗜水的作物，但相當多的棉花產自乾旱的中亞地區。我們可參考澳洲的做法，她在過去十年經歷

a day, and the total direct daily use may be about 100 litres per person. In contrast, it takes more than 10000 litres to produce a kilogram bolt of cloth. The food we eat each day requires 2000 to 5000 litres to produce. It takes 15000 litres to produce a kilogram of beef, compared with 2000 litres for a kilogram of vegetable. The situation will get worse as the world's wealth grows, because affluence means that people are eating more meat.

So what can we do? A simple answer is to find ways to collect more water. After all, we are only extracting for our own use less than 10% of precipitation in the world. There are many ways. Examples include: more reservoirs and dams, but these may have ecological effect; more recycling and de-salination, but these involve costs.

One useful suggestion is to increase the water efficiency in agriculture: agriculture currently uses up 75% of the world's water. Some developing countries are using twice as much water in producing crops as developed countries. A significant portion of the world's cotton, a very thirsty crop, is produced in the rather dry central Asia. We can look







了最嚴重的乾旱。因應缺水情況，一些澳洲的農民改種用水較少的作物，成功保持穩定的出產。在某方面，水的生產效率甚至是原來的兩倍。

在個人層面，我們只需將生活方式稍作調節，便可減省用水，例如衣服穿著多次才好丟掉。更重要的是改變飲食習慣，少肉多菜，既節約用水，又有益健康。

李本滢

2009年10月14日

to Australia as a good example in water efficiency. The country suffers from its worst drought in the past ten years. In response, some Australian farmers have switched to less thirsty crops and are able to keep farm output stable. In some cases water productivity has even doubled.

At the individual level we can also do our part to save water. It only involves a simple switch in lifestyle --- make sure we wear our clothes many times before disposal, and more importantly, change our eating habit to less meat and more vegetable. This is healthier too.

B Y Lee

14 October 2009

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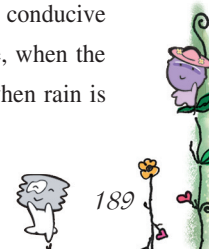
Sources:

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- b) Water Resources Department of Guangdong Province, 2008 – Water Resources Report 2007.
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市民和傳媒有時會質疑我們發出火災危險警告的準則。他們感到疑惑的是，為什麼有時在天氣不利於火災發生的情況下，例如相對濕度高、正在或即將下雨，天文台仍發出火災危險警告。

From time to time we receive queries from members of the public and media about the criteria used in warning fire danger. These queries often relate to the issuing of fire danger warnings when the weather conditions may not be conducive to a high fire risk, for instance, when the relative humidity is high, or when rain is falling or on the way.



在發出火災危險警告時，我們會考慮幾個天氣因素，包括相對濕度、風速和下雨的機會等。另一因素是草的枯乾程度，資料由漁農自然護理署提供。

顯而易見，低濕度、高風速、少雨或無雨，再加上枯乾的植物，便容易發生山火。但較少為人知的是公眾假期與火災危險的關係，所以就向大家介紹天文台同事一些初步研究結果。

圖一表示2002至2007年，不同月份的平均每日山火次數，平日和假期分別計算。圖中可見，假期發生山火的平均次數確實較平日高。

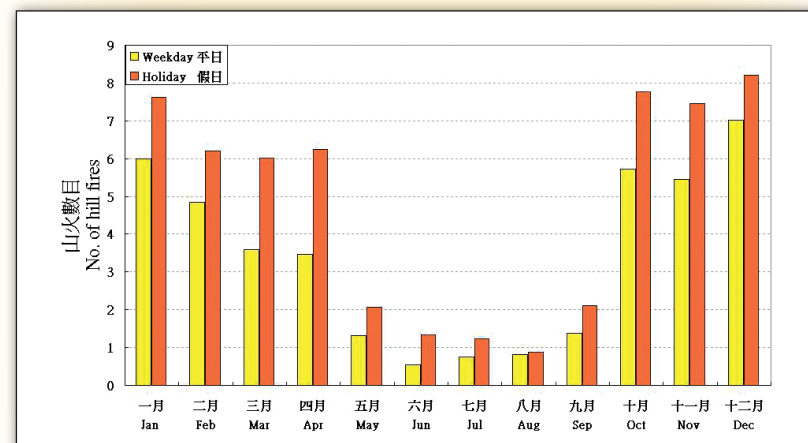
再看看清明節（春季）和重陽節（秋季）對山火的影響。這兩個節日都是公眾假期，中國人習慣登山掃墓，拜祭先人。

Several weather factors are considered in the issuing of fire danger warnings, namely relative humidity, wind strength and the chance of rain. Another factor is the state of grass, i.e. the degree of grass curing (dryness). Information on grass curing is provided by the Agriculture, Fisheries and Conservation Department.

As one can easily imagine, low humidity, high wind and little or no rain, coupled with dry vegetation, would be conducive to a high fire risk. Not apparent, however, is the effect of public holidays on the fire danger. I would like to present some preliminary results of a study made by my colleagues.

Figure 1 presents the number of hill fires per day, separately for weekdays and for holidays, averaged for each month over the period 2002-2007. It can be seen that hill fires on holidays are consistently higher than those on weekdays.

We can further look into the effect the Ching Ming (around spring time) and Chung Yeung (autumn time) festivals may have on hill fires. Both are public holidays in Hong Kong where Chinese people traditionally go to the hills or cemeteries and pay tribute to their ancestors.



圖一：2002至2007年平均每天山火數目  
Figure 1 : Daily mean number of hill fires, 2002-2007

圖二顯示2002至2007年，在清明和重陽節前後的山火數字。

數字說明一切。圖一及圖二清楚指出，清明和重陽節的山火次數遠高於平日和其他假日。從圖二亦可見，在這六年間，重陽節的山火數字幾乎是清明節的兩倍。這大概因為重陽節在秋季，濕度較低和植物較乾。

Figure 2 presents hill fire figures around the time of Ching Ming (top) and of Chung Yeung (bottom) for the period 2002-2007.

The numbers speak for themselves. Taking Figure 1 and 2 together, one can readily see that hill fire figures for Ching Ming and Chung Yeung far outstrip those for ordinary days and other holidays. Statistics behind Figure 2 also indicate that hill fires during Chung Yeung nearly double those of Ching Ming over the 6-year period, probably a result of lower humidity and drier vegetation.



圖二(a)亦顯示2003年清明節的山火較少。這大概與當時「非典型肺炎」肆虐，市民多留在家中有關。另一個山火較少情況出現在2007年，可能因為當年年初政府和各團體着力推行「零山火」計劃。可惜人的記憶是短暫的，同年的重陽節，故態復萌，山火再次肆虐(圖二(b))。罪魁禍首是在郊外留下火種，而火災危險警告正是要提醒市民不要這樣做。

由此可見，雖然在評估火災危險的氣象因素時，我們必須以科學為基礎(例如天氣觀測數據)，但要火災危險警告能有效保障人命和珍貴樹木的安全，必須同時顧及社會因素。

李本澄

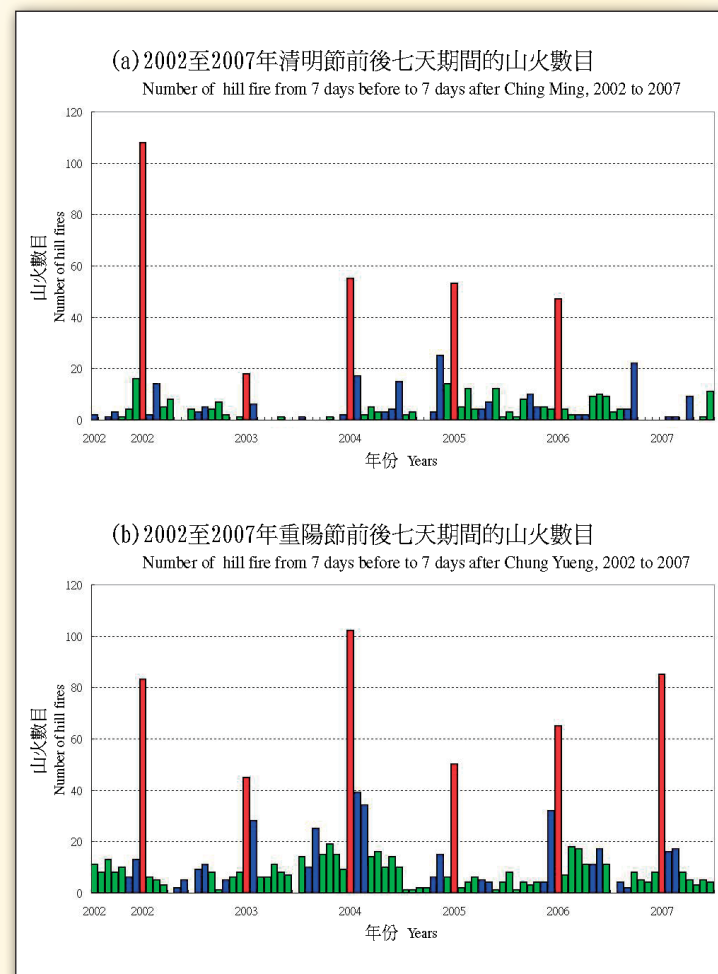
2009年10月21日

One can also notice that fewer hill fires were reported for the Ching Ming of 2003 (Figure 2(a)), probably because people stayed home during the SARS epidemic at the time. Another low in the number of hill fires occurred in 2007, and this could be attributed to an awareness campaign for 'zero hill fire' conducted early that year. However, memory was short and hill fires returned with a vengeance in Chung Yeung (Figure 2(b)) the same year. Leaving fires behind in the countryside is the main culprit. The purpose of fire danger warnings is to remind people not to do just that.

As you can see, while meteorological assessment of the fire risk must be based on science (for example, weather measurements), operation of the fire danger warnings in order to save lives and rescue our precious trees would not be effective without taking account of societal factors.

B Y Lee

21 October 2009

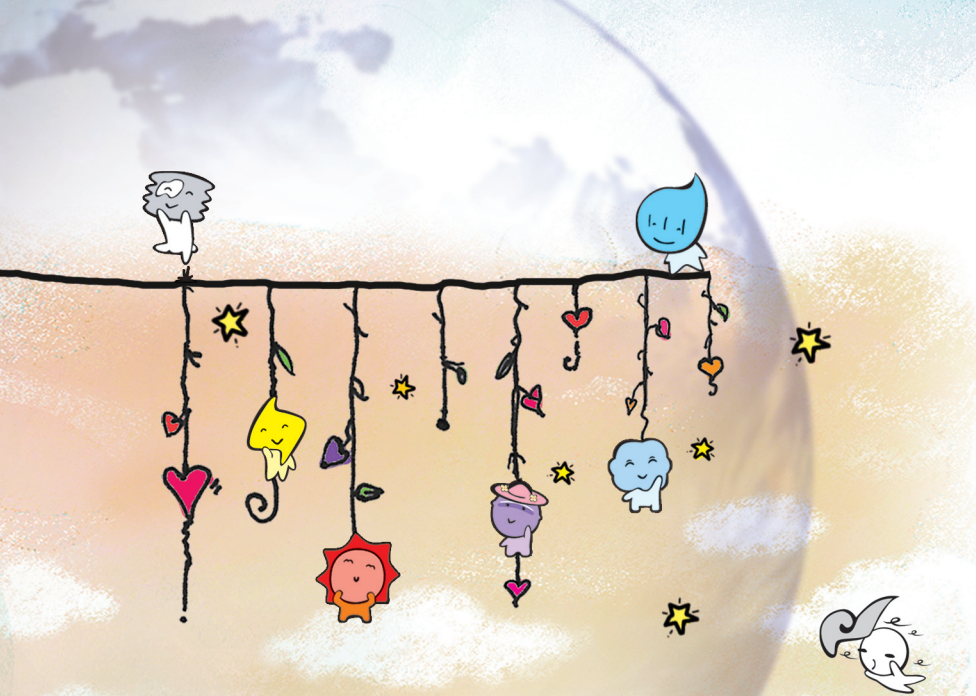


圖二：2002至2007年清明和重陽節前後的山火次數。紅柱代表在清明和重陽節當日的山火次數，左邊和右邊的七條柱分別表示在該節日前七天和後七天的山火次數。

Figure 2 : Number of hill fires around the times of Ching Ming and Chung Yeung, from 2002 to 2007.

The red bars represent figures on the day of Ching Ming and Chung Yeung.

Daily figures for the 7 days prior to and 7 days after the festival event are plotted to its left and right respectively.



# 香港未來的海面高度

## Future sea level in Hong Kong

我之前談到香港未來的雨量，今次和大家分享一些全球氣候變化引致本港海面上升的最新資訊。本文的內容，我在今年十月舉行的第二屆全球氣候變化會議上已作介紹。

Further to a previous blog on rainfall, I would like to share with you the latest about the local sea-level rise because of global climate change. The material used here had been presented in the International Conference on Climate Change 2009 in early October.

香港有多個潮汐監測站，最早的建於1950年代。因此我們有超過五十年的海平面高度的數據，是研究海面高度變化的重要基礎。在過去五十多年，維多利亞港的平均海平面高度上升了13厘米左右。

聯合國「政府間氣候變化委員會」在2007年發表的報告中，推算到本世紀末，全球海平面將平均上升18至59厘米。但由2007年至今，科學家對海平面上升的原因了解多了，並且確定了造成上世紀海平面上升的主因。

第一個原因是高山冰雪及冰川融化，例如喜馬拉雅山脈上的冰雪和阿拉斯加的冰川。預計到2100年，這個因素會令海平面再上升10至20厘米。第二是海水受熱膨脹。預計到2100年，這個因素會令海平面上升20至50厘米，上升幅度視乎未來溫室氣體的排放情況。

A number of tide gauges were installed in Hong Kong, the earliest in the 1950s. This gives us over 50 years of sea level data, and serves as an important basis for studying sea level changes in Hong Kong. The mean sea-level in Hong Kong's Victoria Harbour has risen by about 13 cm over the past 50 years or so.

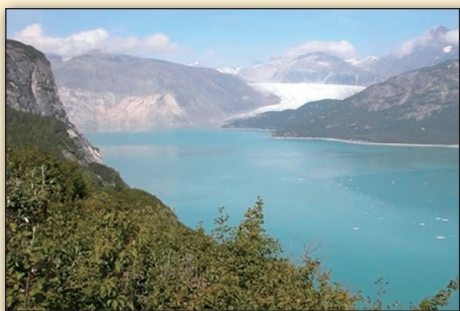
The United Nations IPCC (Intergovernmental Panel on Climate Change) report predicted in 2007 that globally the overall sea-level will rise between 18 and 59 cm by the end of the century. Since 2007, however, scientists have learnt more about what is behind the rise and have pinpointed the leading causes of sea-level rise in the past century.

The first contributor is the melting of mountain ice and glaciers in such places as Alaska and the Himalayas. This is expected to add another 10 to 20 cm to sea level by 2100. The second contributor is the thermal expansion of ocean water, which depending on the future scenarios in respect of emission of greenhouse gases is expected to raise the sea level by 20 to 50 cm by 2100.

The third contributor is the melting of the great land ice on Greenland and







圖一：阿拉斯加冰川灣 - 謬爾冰川 (Muir Glacier, Alaska's Glacier Bay) 在1941年 (上) 至2004年 (下) 期間，冰川後退了超過12公里和變薄超過800米。

Figure 1 : Muir Glacier, Alaska's Glacier Bay on 13 August 1941 (upper) and 31 August 2004 (lower). Between 1941 and 2004 the glacier retreated more than twelve kilometers and thinned by more than 800 meters.

圖片來源 (Image source) : NSIDC/WDC for Glaciology, Boulder, compiler. 2002, updated 2006. Glacier Photograph Collection. Boulder, CO : National Snow and Ice Data Center/World Data Center for Glaciology. Digital media.

第三是格陵蘭和南極洲大片陸上冰雪融化。假如這兩個地方的冰雪全部融化，將令全球海平面上升70米。政府間氣候變化委員會 (2007) 推算到2100年，格陵蘭冰雪融化將令

Antarctic, which hold enough water to raise sea level by 70 metres. IPCC predicted that Greenland would contribute up to 12 cm to sea-level rise by 2100, while Antarctica would eventually gain ice. However, recent studies show that this may be too conservative. Monitoring

海平面最多上升12厘米，但南極洲的冰雪則會增加。不過，近期的研究顯示這個預測過於保守。根據過去幾年的監測，這兩個地區的冰雪正加速融化。

綜合上述幾個因素，預計到世紀末2100年全球海平面將上升0.4至0.8米，遠高於政府間氣候變化委員會的估計。

另一個較簡單的做法是用統計方法，找出海平面高度和溫度的關係，結果發現兩者在過去一百二十年有很好的相關性。以這個方法推算，海平面將上升0.5至1.4米。然而，有些科學家認為過去的線性關係在未來將不再存在，因為會有多項正反饋，例如冰雪融化後的水會引起起潤滑作用，加劇冰川的融化。據此，他們推算海平面將上升0.8至2米，相當驚人。

對香港的影響又如何？不

of both these ice caps over the past couple of years shows that they are melting at an accelerating rate.

Taken together, these three factors are expected to contribute 0.4 to 0.8 m to sea-level rise by 2100. This is way higher than IPCC's estimate.

Another simpler, statistical approach taken recently relates the sea level to temperature and has identified good correlation between the two for the past 120 years. The projection based on this approach is 0.5 to 1.4 m. Some scientists however argue that the linear relation would not hold for the future because there is multiple positive feedback, such as lubrication of glaciers by meltwater. Their estimates come to an alarming 0.8 to 2 metres.

So what does this hold for Hong Kong? Whatever the future projection, it now looks more than likely that IPCC's estimate is too optimistic, as the lowest and most conservative estimates are now already comparable to its highest estimate.

Like many coastal cities, Hong Kong will be affected by more severe flooding and a higher storm surge, which is elevated sea level brought about by an





圖二：2008年9月颱風黑格比襲港，大澳嚴重水浸。

(照片由電視廣播有限公司提供)

Figure 2 : Flooding in Tai O after the passage of Typhoon Hagupit in September 2008  
(Photograph courtesy of TVB)

論以什麼方法推算，政府間氣候變化委員會的估計都似乎太樂觀，因為以其他方法推算的下限都差不多等於它的最高估計。

和很多沿海城市一樣，香港將會受到更多嚴重水浸和風暴潮影響。風暴潮是指熱帶氣旋移近時令海面升高。以往發生過多次水浸，都是由於大雨加上潮水高漲及/或風浪引致。也發生過由於海水倒流入珠江

approaching tropical cyclone. There have been incidences of flooding caused by rain runoff backed up by high tides and/or wind waves. There have also been cases of freshwater salination as a result of seawater intrusion into the Pearl River estuary. A raised sea level will make things worse.

In respect of storm surge, we do not have to look too far back. In September 2008, Typhoon Hagupit brought a storm surge exceeding 1.4 m, resulting in severe flooding in number of low-lying places. The worst hit was Tai O, on Lantau Island west of the international airport. You can

三角洲而導致淡水變鹹。海平面上升將會令上述情況更為嚴重。

關於風暴潮，我們應記憶猶新。2008年9月，颱風黑格比襲港引致超過1.4米的風暴潮，令多處低窪地區嚴重水浸。受災最重的是大澳。假如全球暖化令海平面升高，可以想像，同樣的颱風將來襲港會帶來什麼災害。對抗氣候變化，實在刻不容緩。

imagine what it is going to be like when, with a raised sea level brought by global warming, Hong Kong is hit by a similar storm in future. We certainly need to ask ourselves what we can do to combat or reduce the effects of climate change.

B Y Lee  
2 November 2009

李本澄  
2009年11月2日

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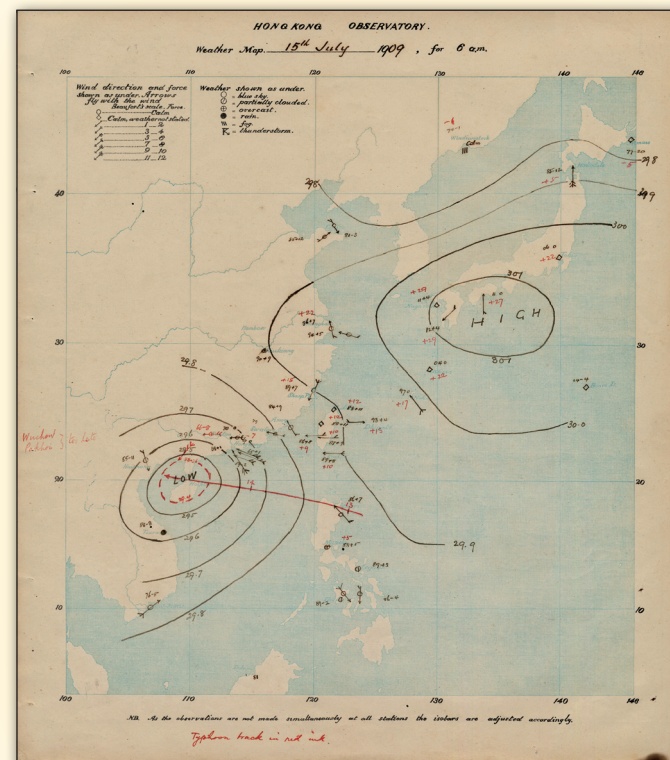






# 百年歷史的天氣圖

## A century-old weather map



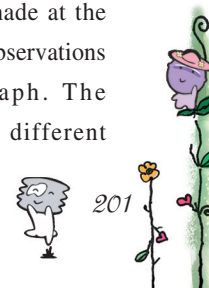
圖一：1909年7月15日的天氣圖  
Figure 1: The July 15 1909 weather map.

天文台預測總部陳列了一幅古舊的天氣圖，供訪客觀賞。日期是1909年7月15日，是天文台現存最早的天氣圖之一，到今年剛好有一百年歷史。1909年的中國仍是清代時期。

Visitors to the Observatory's forecasting office often see an old weather map on display. Dated 15 July 1909 and one of the oldest weather maps kept here, it is exactly 100 years old this year. China in 1909 was still in the Qing Dynasty.

圖上繪畫了不少天氣觀測資料。除天文台外，其他的觀測資料都是以電報接收。觀測在每日不同時間進行。例如根據天文台出版的「中國沿岸氣

There are a number of weather observations plotted on the map. Except for the observation made at the Observatory itself, all other observations were received by telegraph. The observations were made at different



象紀錄」，廣州的觀測在上午9時進行，台北則在上午5時。發出電報的時間也不盡相同，有些由於接收太遲（例如來自海口的電報），以致不能用於天氣預報。

觀測資料的格式如下：溫度以華氏度表示；濕度為百分比；氣壓以水銀柱高度（英吋或毫米）表示；風向以十六點方位劃分，以箭頭表示，風速則按照蒲福氏風級表，以風羽表示。

為分析天氣形勢，預報員根據圖上的氣壓數值繪畫等壓線。由於氣壓有日際變化，因此圖上註明「由於各站的觀測時間不同，等壓線已作相應調整」。按照該圖的分析，有一颱風當時正影響海南島。

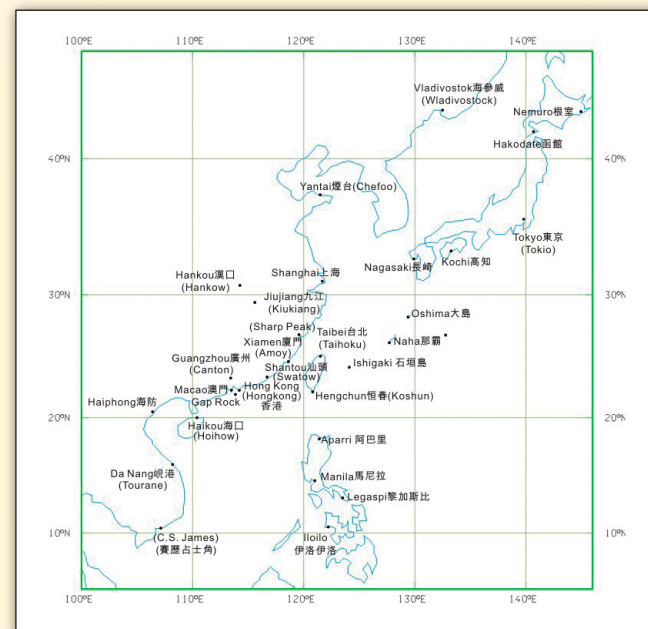
若仔細觀察，圖上顯示香港有三個觀測資料。一個在 天文台（1884年開始運作），另一個在太平山頂（1884年開

times of the day. For instance, according to the China Coast Meteorological Register published by the Observatory, the observation at Guangzhou ('Canton') was made at 9 a.m., while that at Taipei ('Taihoku') was made at 5 a.m. So were the telegraphs, some of which (e.g. those from Haikou ('Hoihow')) reached Hong Kong "too late for forecasting purposes".

The observations were reported as follows: temperature in degrees Fahrenheit; humidity in percentages; air pressure in inches or millimeters of mercury; and wind - direction in 16-point compass and plotted in the form of an arrow, and speed in Beaufort force and plotted in the form of barbs.

To bring out the weather pattern, isobars were drawn based on the air pressure values. Because air pressure varies with the time of day, the footnote on the map states "As the observations are not made simultaneously at all stations the isobars are adjusted accordingly." The pattern on the weather map revealed that a typhoon was affecting Hainan Island at the time.

If we look carefully at the map, we can see three weather observations



圖二：顯示各觀測地點的位置、現代名稱及舊名（括弧內）。

Figure 2 : shows the places where observations were made, their present names, as well as their old names (in bracket) as appeared on the map.

始運作），第三個在 Gap Rock（位於香港西南約四十公里的外站，1892年開始運作）。

1842年，第一次鴉片戰爭後香港島成為英國殖民地。天文台所在的九龍在1860第二次鴉片戰爭後也割讓給英國。連

over Hong Kong. One was made at the Observatory (which started operation since 1884), the other at Victoria Peak (since 1884) and the third at Gap Rock (since 1892), which was an outpost some 40 km to the southwest.

Hong Kong Island was a British colony since 1842 after the First Opium War, while Kowloon where the





同1898年租借給英國的新界，三地於1997年全部歸還中國。在香港西面的澳門亦曾在十六世紀至1999年間成為葡萄牙的海外屬地。

雖然有些模糊難辨，但在圖一可見四個因1842年南京條約而開放的口岸，包括廣州、廈門、福州（在圖上稱為「Sharp Peak」）和上海。另一個開放口岸寧波則不在圖上。因1858年天津條約而開放口岸的煙台、九江、漢口、汕頭和海口亦在圖上。

當時各港口的氣象服務由中國海關總稅務司羅伯特·赫德爵士（Sir Robert Hart）統籌。他自1863年至1900年代末出任該職位。而杜伯克博士在1883年出任香港天文台台長之後，對統一氣象觀測工作亦起關鍵作用。

圖上有另外兩個中國地

Observatory is located was ceded in 1860 after the Second Opium War. Together with the New Territories to the north of Kowloon, which was leased in 1898, they were handed back to China in 1997. To the west of Hong Kong is Macao, a Portuguese enclave from the 16th century to 1999.

Although too faint to be discerned from Figure 1, other Chinese places on the map consist of 4 of the 5 treaty ports of Guangzhou ('Canton'), Xiamen ('Amoy'), Fuzhou (designated as 'Sharp Peak' on the map), Ningbo (not on map) and Shanghai, opened up as a result of the Treaty of Nanking (present-day Nanjing) in 1842. Also on the map were Yantai ('Chefoo'), Jiujiang ('Kiukiang'), Hankou ('Hankow'), Shantou ('Swatow') and Haikou ('Hoihow'), ports opened after the Treaty of Tianjin in 1858.

Co-ordination of a meteorological service at the ports was the work of Sir Robert Hart, who served as Inspector General of the Imperial Maritime Customs of China from 1863 to the late 1900s. Dr. W. Doberck, the Observatory's first director, was instrumental in unifying the meteorological observations upon taking

方一台灣的台北和恆春。台灣在1895至1896年甲午戰爭後被割讓給日本，在1945年二次大戰後歸還中國。

在圖二的左下角有三個越南地方——海防、峴港和在現今胡志明市附近的「C.S. James」。除了1940年代二次大戰被日軍侵佔的幾年外，越南自十九世紀末至1954年間都是法國的印支屬地。

圖的中下部分是菲律賓。她原為西班牙屬地，在1898年被割讓給美國。在繪畫天氣圖（圖一）時，菲律賓正與美國開戰，戰事至1913年為止。當時馬尼拉的氣象部門首長為Fr. Algue神父。

上述種種告訴我們，1909年的天氣觀測絕大部分在當時的列強或其控制的地區進行，而滿清中國則垂暮落後。兩年後，辛亥革命在國父孫中山先

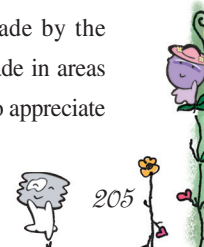
command of the Observatory in 1883.

On the map were two other Chinese places - Taibei and Hengchun ('Taihoku' and 'Koshun' respectively during Japanese occupation) in Taiwan, ceded to Japan after the Sino-Japanese War in 1895-1896 and returned to China after the Second World War in 1945.

On Figure 2's lower left, there are three Vietnamese places: Haiphong, Da Nang ('Tourane' during the French colonization) and 'C.S. James' near present-day Ho Chi Minh City. Vietnam was part of the French Indochina from the late 19th century until 1954, with an interruption of a few years by Japanese invasion during the Second World War in the early 1940s.

On the lower middle, the Philippines under Spanish sovereignty was ceded to the United States in 1898. At the time of the weather map, the Philippine-American War was underway, lasting until 1913. The Manila Observatory was run by a Reverend Fr. Algue as the Director.

The above tell us that most if not all observations in 1909 were made by the Great Powers at the time or made in areas under their control. One can also appreciate





生領導下，推翻了滿清皇朝。

十年後的1919年，中國爆發五四運動，到今年也九十周年了。由於得到廣泛的支持，五四運動大大提升了人民的愛國精神，並如已故台灣學者殷海光先生所說，令中國的知識分子普遍接受科學和民主。

李本滢

2009年11月17日

how backward China was in those waning years of the Qing Dynasty. It was two years before the Chinese Revolution in 1911, in which Dr Sun Yat-sen, Father of the Nation, played an instrumental role in overthrowing the dynasty.

It was also 10 years before the May 4 Movement in 1919, whose 90th anniversary was commemorated nationwide this year. With a broad popular foundation, the movement led to an upsurge in Chinese nationalism and, in the words of the late Taiwan scholar, Yan Hai-guang, to a widespread embrace of science and democracy by Chinese intellectuals.

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