## 你可知道 ……

如何點算閃電？
迷你冰河時期即將來臨？
沙塵暴對香港會造成甚麼影響？
中國的人口和氣候變化有甚麼關係？
天文台術語 — 甚麼是「豬腰」？甚麼是「沙灘球」？
徐家匯與香港天文台有甚麼歷史淵源？
自然奇景 — 甚麼是「佛光」？
風暴潮的威力有多大？
氣象奇觀 — 三度彩虹如何形成？

## *Do you know ……*

How is lightning counted?
A mini ice age now in the making – how true is it?
What impact sandstorms have on Hong Kong?
Did the changing climate change China's population?
Observatory jargon – What is a "kidney"? What is a "beach ball"?
How is Zi-ka-wei in Shanghai related to the Hong Kong Observatory?
Nature's spectacle – What is a 'glory'?
Storm surge – how bad can it get?
Magic in the sky – how does a triple rainbow form?

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# 局長私記
# Director's Collectanea

局長私記 Director's Collectanea






香港天文台
HONG KONG OBSERVATORY

# 总裁私记

Director's Collectanea

# 台長札記
## Director's Collectanea

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# 前言

天文台「台長網誌」自2008年推出以來，快將踏入第四年，內容由最初側重講解自然現象和回應民情，逐步添加分享人生體驗的元素。從日常天氣現象，到影響深遠的氣候變化；由歷史故事和生活片段，延伸至科學進程及人生哲理。這亦反映了天文台工作與民生息息相關。

我感謝天文台同事們的協助。縱使不少文章涉及專業的知識，在各人同心協力下，藉著「台長網誌」這一個平台，仍然把相關技術和理據，以有限篇幅及簡單圖表向公眾說清楚。

我們深信，知識的傳遞不應受到媒介的限制。今次把文章匯集成書，取名「台長札記」，可以讓一些不太習慣上網的讀者分享我們的見解和想法，也方便市民把喜歡的文章保存留念。我們期望這些文章可以促進市民關注潛在的自然災害和氣候變化等議題，讓大家參詳並付諸實行，一起造福社會。

香港天文台台長
李本瀅
二〇一一年二月

# Preface

In 2008, we started the Director's Blog in the Observatory website to explain how weather and geophysical events affected our life, and to use it as a channel of communication with the general public on the work of the Observatory. Through the years, the Director's Blog has evolved into a forum not just for sharing of knowledge and experience, but also expression of personal feelings. The topics are diverse, ranging from a single weather event to a series of climate issues with far-reaching consequences, and inextricably interwoven with the history of science and humanity into stories. In a subtle way, it is a collective reflection of the passion of the men and women of the Observatory to serve the community and their love of nature.

I wish to thank the many colleagues who have assisted in the preparation of the blogs. Some topics are unavoidably technical and specialized. My colleagues have nevertheless helped make them accessible to the readers through easy visualization of the concepts with the use of graphics.

We firmly believe that knowledge should be propagated through all kinds of medium. This handy "Director's Collectanea" is meant for those who do not often surf the web. We hope that the blogs serve to protect the public from nature's harm, through promoting a better understanding of natural disasters and climate change, and a heightened awareness of these events. This book is dedicated to all who put their thoughts into action and make our world a better one.

**LEE Boon-ying**
**Director of the Hong Kong Observatory**
**February 2010**

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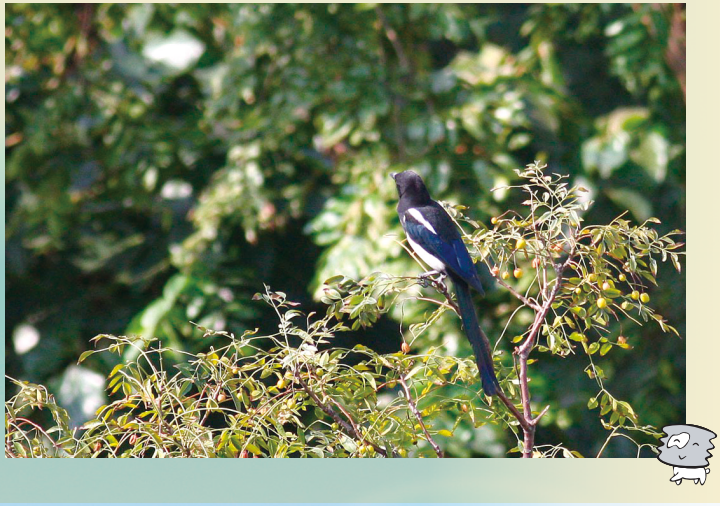
# 天文台的集體回憶

## Observatory heritage



天文台總部有一枝桅杆，支撐著舊日用作接收世界各地天氣數據及天氣圖的天線。該天線已被列作天文台的文物。近日有同事留意到有雀鳥在桅杆頂部雀巢旁憩息。

The other day a colleague spotted a bird next to the nest it built near the top of a mast. The mast supports an aerial network which the Observatory used in the old days to receive radio broadcasts of weather data and charts from elsewhere in the world. The network is a declared heritage item.



漁農自然護理署的同事已確認是普通的喜鵲，常見於市郊。我們在天文台所見，喜鵲有長達二十厘米的尾巴，較易辨認。在忙著築巢時，其尾巴常伸出巢外。其下有一個舊鳥巢，現為其他雀鳥所用。

喜鵲常在天文台一八八三大樓走廊上棲息，彷彿並不怕人。牠有一個有趣的特性，是唯一一種能在鏡中認出自己的非哺乳類動物，即使貓狗也不能做到。

A colleague from the Agricultural and Fishery Conservation Department kindly confirms that the bird is a common magpie. Common in suburban areas, the magpie can be identified by its long tail, some 20 centimetres on the ones we see at the Observatory. Its tail can often been seen sticking out of the nest as it busies itself with building or reinforcing the nest. The old nest underneath is being used by some other birds.

Magpies are often seen resting on the verandah of the Observatory 1883 Building. They do not avoid people. An interesting tidbit about magpie is that it is the only non-mammal that recognizes itself in a mirror. Even your pet dog or cat cannot do that.



今年6月，著名野生動物學家珍古德博士（Dr Jane Goodall）到訪天文台，除了與我們分享她對黑猩猩的認識，更示範黑猩猩怎樣和同類打招呼。她參觀了我們細小的歷史室，聽我們簡介天文台的歷史。途中她看到這些鳥巢，感到十分驚訝。事後她在給我們的信中說，假如天文台失去了這些文物，將是一大壞事。她所說的，自然包括在天文台棲息的喜鵲和其他雀鳥。

李本瀅

2009年12月21日

During her visit in June this year, Dr Jane Goodall, renowned expert on wildlife, shared her experience with chimpanzees, demonstrating to Observatory colleagues how chimpanzees said hello to each other. She visited our small history room and was briefed about the Observatory's past. On the way she saw the nests and was amazed. She later wrote to tell us that it would be 'wicked' if the Observatory lost the heritage. The magpie and other birds in the compound are obviously part of that.

LEE Boon-ying

21 December 2009

# 再生能源的潛力
# The potential of renewables

世界氣象組織在11月23日出版的「2008年溫室氣體公報」（Greenhouse Gas Bulletin）再次提醒我們二氧化碳問題的迫切性。最新濃度是百萬分之385 (ppm)，較前一年增加百萬分之二。

在過去一萬年，大氣中的二氧化碳濃度穩定在280 ppm左右，直至18世紀末工業革命開始。最新數字表示增加了105 ppm，即百分之三十八。增加主要是由於燃燒化石燃料（例如汽油和煤）、砍伐森林和土地用途改變。燃燒化石燃料令原本深藏地底的碳源釋放到大氣中，而砍伐森林和土地用途改變則使植物減少，削弱地球透過光合作用吸收二氧化碳的能力。

The World Meteorological Organization's Greenhouse Gas Bulletin 2008 released on 23 November reminds us once again the imminent carbon dioxide issue. The latest concentration is 385 parts per million (ppm), up 2 ppm from the previous year.

For the past 10,000 years, carbon dioxide levels stayed at about 280 ppm till the start of the industrial revolution in the late 18th century. The new figure represents an increase of 105 ppm, or 38%. The increase primarily arises from: combustion of fossil fuels such as gasoline and coal, deforestation and land use change. Burning of fossil fuels adds carbon dioxide to the atmosphere from sources hitherto buried underground, while deforestation and land use change cause a reduction in plant life which acts as a carbon sink through photosynthesis.

So what can we do? In his 2006 review on the economics of climate change, Sir Nicholas Stern, the ex-Chief Economist of the World Bank, pointed

我們可以做什麼？2006年，前世界銀行首席經濟大師Sir Nicholas Stern回顧氣候變化對經濟的影響時指出，若不立即行動以減緩全球暖化，則全球GDP將損失約百分之五。相反，若我們迅速行動，付出成本僅是GDP百分之一。

2008年經濟諾貝爾獎得主克魯明教授（Paul Krugman）在紐約時報發表文章表示，即使大幅減少溫室氣體排放，家庭開支亦只會略為增加。

但這些「成本」應如何投放？向那裡投放？今年11月出版的《科學美國人》雜誌（Scientific American）一篇文章討論發展再生能源以滿足世界能源需求的可能性。它指出全世界的能源需求最多達13萬億瓦（即13之後加十二個零），預計到2030年會增至約17萬億瓦。

to a cost and risk on par with a 5% loss in global GDP each year if nothing is immediately done to slow down global warming. On the other hand, it only costs the world 1% of GDP if action is quickly taken.

In a New York Times article in September this year, Professor Paul Krugman, winner of the Nobel Prize in economics in 2008, also said that a significant reduction in greenhouse gas emissions would only add a small cost to household expense.

But where and how this 'cost' should go? An article in the November 2009 issue of “Scientific American” (the 'article') discusses the potential of renewable energies in meeting the world's energy needs. It points out that at any given moment the world requires a maximum of about 13 terawatts (TW, i.e. 12 zeros), and this is expected to increase to some 17 TW by 2030.

How much of this is renewable energy? Currently, wind and solar power are together producing a paltry 0.03 TW, or 0.2% of the current requirement. While visiting the Observatory last month,

當中有多少是再生能源呢？目前，全球風和太陽能合共只提供0.03萬億瓦，僅及需求的百分之0.2，可謂微不足道。上個月，美國愛荷華州立大學何啟明教授到訪天文台時談到，太陽照射地球一小時的能量，便足以供應全球一年所需，可見發展的空間相當大。

《科學美國人》雜誌的文章評估了各類再生能源的潛力，特別是風和太陽能。據文章估計，撇除海洋、高山和其他不毛之地，風和太陽能分別可提供60和600萬億瓦，合共660萬億瓦。保守估計，我們只須在其中提取的百分之五，即30萬億瓦，已足以應付全球所需有餘，無須增加溫室氣體，亦即無須令地球升溫。

不過，生產大量的風力渦輪機和太陽能電池板會導致所需的稀有金屬的需求上升。科學家可以做和正在做的，是研

Professor HO Kai-ming of Iowa State University, USA, related that all the solar energy falling upon the Earth in an hour alone is sufficient to power the whole world for a year. There is thus tremendous room for development.

The article evaluates the potential of renewable energies, in particular wind and solar energy, and estimates that excluding places such as oceans, mountains and other inaccessible areas, the potential for wind and solar power is about 60 and 600 TW respectively, giving a total of 660 TW. Taking a conservative approach, if we can just extract 5% of it, i.e. 30 TW, the world would even end up with surplus energy. The world will become much better, with no additional greenhouse gases and thus no further warming.

The issue with manufacturing a large quantity of wind turbines and solar panels, however, is the attendant rise in demand for rare metals which are required for these green technologies. What scientists can do, and is doing, is to research alternative or better materials to ease the demand.



太陽熱能收集器（照片由可風中學提供）
Solar thermal collectors (Photograph courtesy of Ho Fung College)

究使用替代物料以舒緩這些稀有金屬的需求。

另一項日益受到重視的太陽能發展是採用太陽熱能收集器，將陽光轉化為熱能。這有別於光優板，後者將太陽能轉為電力。由多間德國公司組成的財團正計劃在撒哈拉沙漠建造大量的太陽熱能收集器，以提供到2050年歐洲所需電力的百分之十五。

聯合國秘書長潘基文在2007年於華盛頓郵報發表文章

Another development involving solar energy is the increasing popularity of solar thermal collectors which convert sunshine into heat, as opposed to solar panels which turn solar energy into electricity. A consortium of German corporations is currently planning a large number of solar thermal collectors in the Sahara with a view to supporting 15% of Europe's electricity needs by 2050.

Mr BAN Ki-moon, the U.N. Secretary-General, proposed in an article on the Washington Post in 2007 that humankind is experiencing a major transition into a 'green' economy, where through concerted effort we can face up

說，人類正過渡到「綠色」經濟，透過共同努力，我們將能以相對廉價及可持續的方式應付氣候變化的挑戰。

綠色科技愈來愈重要。採用綠色科技有助提升企業的形象。不久將來，世界上許多地方可能需要購買貼上綠色標籤，或嚴格符合低碳或「碳中性」標準的貨品。因此，綠色科技既能對抗氣候變化，又可帶來新的商機。

李本瀅

2009年12月9日

to the challenge of climate change in a relatively inexpensive but sustainable way.

Green technology is now coming to the fore. Its adoption boosts a company's image. More often than not, procurement in the near future may demand a green label or strict low-carbon or carbon-neutral standards. Green technology can therefore be, and probably is, a very good choice when it comes to combating climate change and seizing new business opportunities.

LEE Boon-ying

9 December 2009



# 天文台達標嗎？

# Is Observatory up to the mark?

月初有報紙報導，過去三年（2007至2009年）天文台共發出了21次3號或8號熱帶氣旋警告。其中有10次準確，另外11次的實際風勢則未及原先預計般猛烈。換言之，天文台的熱帶氣旋警告約有一半準確。

我在此可多談一下。

準確發出熱帶氣旋警告的意思是，在該氣旋襲港期間，本港八個參考氣象站中有四個錄得強風（如發出的是3號）或烈風（如發出的是8號）。

我在2009年5月15日的網誌上說過，儘管我們近數十年來對熱帶氣旋的預測不斷進步，但要及時發出熱帶氣旋警告仍存在不少困難。

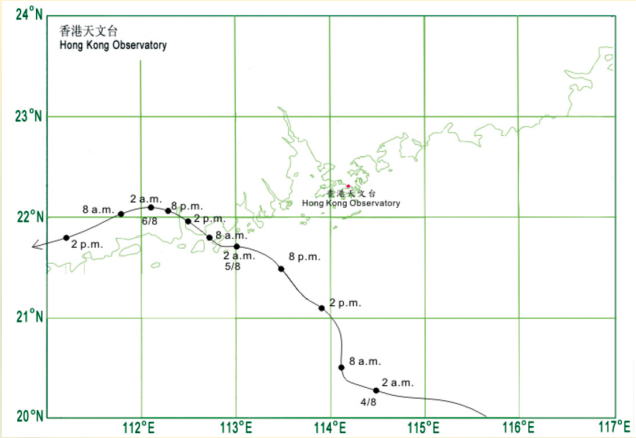
首先，熱帶氣旋的移動和發展往往是不規則的，尤其是當它靠近海岸的時候。由海洋

Some newspapers carried a report earlier this month that in the past three years (2007 to 2009), the Observatory had issued Tropical Cyclone Signals No. 3 or No. 8 on 21 occasions. Of them, 10 turned out to be accurate while for the other 11 occasions wind conditions were not as severe as what had been forecast. In other words, the Observatory is spot on in its tropical cyclone warning about half of the time.

I would like to discuss this further here.

When we say the issuing of a Tropical Cyclone (TC) signal is accurate, we mean that during the occasion strong wind (for TC No. 3) or gale force wind (for TC No. 8) has blown at half or more of the 8 reference weather stations in Hong Kong.

While in one of my previous blogs (15 May 2009) I pointed out that tropical cyclone forecasting has consistently improved in recent decades, difficulties still remain in the timely issuance of TC signals.




圖一：2009年8月強烈熱帶風暴天鵝的移動路徑

Figure 1 : Track of Service Tropical Storm Goni in August 2009

移至內陸的過程對熱帶氣旋的行為表現有深遠的影響。其一是由於在陸上水分的供應被切斷，熱帶氣旋的發展受到限制；其二是地球表面性質的改變，例如陸地粗糙的表面令摩擦力增加，或遇上山嶺，都可能令熱帶氣旋偏離原先預計的路徑。

2009年8月強烈熱帶風暴天鵝襲港的個案，很能說明熱帶氣旋登陸時出現變幻不定的移動。圖一顯示天鵝橫過南海，在香港約一百公里外掠過時出現的不規則路徑。

First, tropical cyclones are known to have rather erratic movement and development. This is especially so when they approach the coast, where a transition from a marine environment to a continental one may have a profound influence on their behaviour. Among other factors, the transition may include the cut-off in the supply of moisture over land which will limit the storm's development, and a change in surface characteristics, for instance an increase in friction due to land surface's roughness or an encounter with hilly terrain, both of which tend to throw a storm off its expected track.

The passage of Severe Tropical Storm Goni in August 2009 is an illustrative case

第二，在發出熱帶氣旋警告時，我們必須預留足夠時間讓學生和僱員回家，讓公共交通增加班次以疏導人潮，以及讓電訊機構能充分準備以應付驟然增加的需求（市民要收拾工作、聯絡親友等），否則整個社會將陷入混亂。因此，我們不能夠為了提高警告達標的比率，而等待風力已經或將近達標時才發出警告。這只會置廣大市民於不顧。

以2008年9月颱風黑格比為例。當時它在香港二百公里內掠過，其風暴潮疊加天文潮引致本港水位上升達3.5米。大澳、屯門和鯉魚門等低窪地區嚴重水浸。根據我們的計算，假如當時黑格比再靠近香港多一百公里，本港水位將會額外上升一至兩米。如果我們沒有預先向市民發出警告，後果實在不堪設想。

of tropical cyclones' erratic movement as they make landfall. Figure 1 shows the post-analysis of Goni's haphazard journey as it crossed the South China Sea some 100 km from Hong Kong.

Second, some time has to be allowed for schoolchildren and the working public to go home, for the public transport to be geared up for the flux of people homeward, and for the local communication infrastructure to be well prepared for the sudden surge in demand as people set about winding down their work and contacting their families and friends. Without this lead time, the society may be thrown into chaos. Thus, waiting until the criteria are met or about to be met before issuing the signal, thereby ensuring a high chance the warning criteria will be met, is not a viable option. This would put people into jeopardy.

Take the case of Typhoon Hagupit in September 2008. It passed within 200 km of Hong Kong, and the combined effect of its storm surge and the high tides resulted in a maximum sea level rise of 3.5 metres. As a result, severe flooding occurred in low-lying areas such as Tai O, Tuen Mun and Lei Yue Mun. Our computations showed that had the storm moved a further



圖二：2008年9月颱風黑格比令大澳嚴重水淹
（照片由電視廣播有限公司提供）
Figure 2 : Typhoon Hagupit brought severe flooding to Tai O in September 2008
(Photograph courtesy of TVB)

我這樣說不是要推卸責任，而是要指出在操作熱帶氣旋警告時，必須以市民生命安全為首要考慮。我們會不停檢討以改善服務。我們的專業氣象團隊會繼續致力改善熱帶氣旋的預報技巧，力求更好地保障市民安全。

李本瀅
2009年11月26日

100 km closer, it would bring an additional rise of 1 to 2 metres. Such a scenario would have been catastrophic had we not given advance warning to members of the public.

I am saying all these not to shirk our responsibilities, but to underpin the importance of operating the tropical cyclone warning service in such a way that public safety is safeguarded. We will constantly review and seek improvement to our services. Our team of professional meteorologists will continue to do their best to further improve the skills of storm forecasting, to better protect the public.

LEE Boon-ying
26 November 2009

# 太陽能有什麼優點？

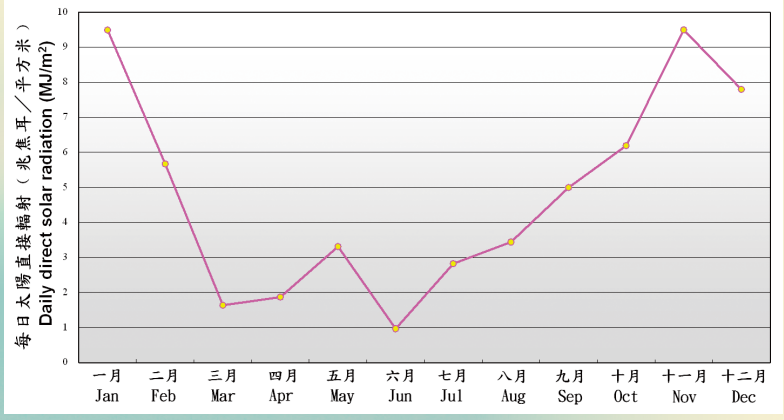
## How good is solar power?



圖一：太陽熱能收集器（照片由可風中學提供）
Figure 1 : Solar thermal collectors (Photograph courtesy of Ho Fung College)

我在早前的網誌中談到再生能源，特別是太陽能，在應付全球關注的氣候變化問題上的潛力。我曾提及太陽熱能收集器在香港及其它地區正逐漸普及。其中的好處不單止一個，請看以下解釋。

In a previous blog, I talked about the potential of renewable energy, in particular solar energy, in tackling the global issue of climate change. I mentioned solar thermal collectors which are gaining popularity in Hong Kong and elsewhere. As I shall explain, there is more than one good reason for this.




圖二： 京士柏量度到的平均每日太陽直接輻射
（2008年11月至2009年10月）
Figure 2 : Daily direct solar radiation measured at King's Park
(November 2008 to October 2009)

究竟使用太陽熱能收集器有什麼優點呢？在香港常見的收集器並不需要高科技。這些收集器十分簡單，不外是利用黑色或深色的物料吸收太陽光。太陽能令管內的水增溫，而自然對流作用令水向上升，到達頂部的一個貯水容器。由於使用了良好的隔熱裝置，太陽熱能收集器甚至在冬季期間亦能提供熱水，如圖二所示。

圖二顯示一塊面向東南（從北面轉120度）及從地平線向上傾斜40度的平面的平均每日

So how good are the solar thermal collectors? The most common ones you see in Hong Kong do not involve high technology. They consist simply of black or dark-coloured absorbers of sunlight. Sunlight heats up the water inside the pipes and causes it to rise, by natural convection, to a storage tank at the top. With good insulation, solar thermal collectors are capable of producing hot water even in wintertime, as Figure 2 shows.

Figure 2 gives the average daily amount of solar radiation directly falling on a flat surface oriented towards the southeast (120 degrees from north) and tilted at 40 degrees from the horizon. The orientation is an optimal one based on available data.

接收到的太陽直接輻射。現有數據顯示，這坐向效果較佳。

如圖二所示，冬天時的直接太陽輻射最高。我們相信這可能與香港年內不同時間的雲及雲種不同有關。可以想像，夏天時雷暴及雨天伴隨的雲層較為深厚，而冬季時乾燥的東北季候風則帶來較薄的雲層。

根據以上的討論，我們計算出如使用兩個大小為一平方米的太陽熱能收集器，在冬天時每日可產生超過100公升的暖水，而一年平均每日也可以產生60公升的暖水。這即是說，冬天最需要時，太陽熱能收集器可以提供較多的暖水，同時減低你的電費。這裏所指的暖水是比其本來溫度高出20℃的水。在計算時，我們作了保守估計，只假定太陽熱能收集器的效率為百分之五十，即是說只有一半的太陽能量被吸收，用來將水加熱。

As Figure 2 shows, the peak of incoming direct solar radiation occurs in wintertime. We believe that this has something to do with the amount and type of clouds at different times of the year in Hong Kong. One can think of the thick clouds in summertime associated with thunderstorms and rain, and the relatively thin clouds if any in wintertime associated with the dry northeast monsoon.

Based on the above, our calculations show that two solar thermal collectors each of size 1 square metre will generate over 100 litres of warm water per day in wintertime and 60 litres per day on average round the year. That is, more warm water comes at a time when you most need it, and you save on your energy bills. By 'warm water' we mean water raised 20°C from its original temperature. In our calculations, a conservative estimate of 50% for the efficiency is assumed, i.e. half of the incoming solar energy is absorbed and used in heating water.

Thus, solar thermal collectors are handy when it comes to providing your household needs. If installed on the roof,

由此觀之，太陽熱能收集器實在方便家居的需求。如果將之安裝在屋頂，足以使到室內的溫度稍為下降，進一步減省夏天空調的費用。另外，採用太陽熱能收集器來產生電力比太陽能板或太陽能電池更有效。太陽熱能收集器的其中一個缺點是一般需要有直接的陽光照射，在多雲的時間輸出的能量會大大減少。但是，在香港而言，充沛的陽光強度足以彌補這小缺點。

李本瀅

2009年12月29日

they help lower the indoor temperatures a little, resulting in further energy savings on air conditioning in summer. When used for generating electricity, they are also generally more efficient than solar panels or solar cells. A drawback is that solar thermal collectors require direct sunlight, as cloudy days tend to diminish the power output a lot. However, the intensity of sunshine in Hong Kong is enough to more than compensate for this.

LEE Boon-ying

29 December 2009



# 徐家匯天文台

# Zi-ka-wei (Xujiahui) Observatory



圖一：St. Ignatius Cathedral聖依納爵主教座堂（照片由楊漢賢先生提供）
Figure 1 : St. Ignatius Cathedral (Photograph courtesy of Mr YEUNG Hon-yin)

許多人都知道，徐家匯位於上海市中心的繁榮商業區，乘搭地下鐵路便可到達。1847年，天主教耶穌會在那處建立了大教堂，但相信於1850及1860年代在「小刀會」及「太平天國」亂世遭受嚴重破壞，其後於1906年重建。現時外國人仍稱之為St. Ignatius Cathedral（聖依納爵主教座堂）。

Xujiahui, as many of you know, is a busy commercial district in downtown Shanghai and is readily reached by underground. It features a cathedral which was originally built by the Jesuits in 1847, severely damaged probably during the 'Small Swords Society' and 'Taiping' upheavals in the 1850 and 1860s, and later reconstructed in 1906. It is still referred to in English as the St. Ignatius Cathedral.



圖二：意大利耶穌會士利瑪竇（左）及徐光啟（圖片來源：維基百科）
Figure 2 : Italian Jesuit Matteo Ricci (Left) and Xu Guangxi (Image source : Wikipedia)

徐家匯地區有部份地方是徐光啟家族所捐贈的。徐光啟（明朝，1562至1633年）可能是中國最知名的天主教信徒，曾協助意大利耶穌會士利瑪竇（1552至1610年）將儒家經典首次翻譯成為拉丁文。歐洲今年將紀念利瑪竇逝世四百週年。

較少為人所知的是法國耶穌會士曾於19世紀在那裏建立一所天文台（同時亦建了孤兒院、修道院、學校及圖書館）。徐家匯天文台於1872年設立，對南海作出氣象觀察。該台早期進行天文及氣象觀察、地磁紀錄以及提供報時服務。它是19世紀末期歐洲人獲

Part of the Xujiahui site was donated by Xu Guangxi's family. Xu Guangxi (1562 to 1633, Ming Dynasty) was probably China's most notable Catholic convert. He assisted the Italian Jesuit Matteo Ricci (1552 to 1610) in the translation for the first time of the Confucian classics into Latin. Ricci's death 400 years ago is being commemorated in Europe this year.

Not very well known is the fact that in the 19th century the French Jesuits also built an observatory there (as well as orphanages, monasteries, schools and libraries). The Zi-ka-wei Observatory was set up in 1872 to carry out meteorological observations of the South China Sea. In its earlier years, it made astronomical and meteorological observations, as well as geomagnetic measurements, and operated a time service. It was an important base for Europeans to obtain meteorological



取亞洲氣象資訊的重要來源。近期的《Weather》雜誌引述了它在1880、1881及1882年利用儀器及觀測收集到颱風資料的一篇文章。

徐家匯天文台的職責與香港天文台非常接近。香港政府於1883年應當時的社會需要設立香港天文台，工作重點在報時服務及氣象觀測。由於這個原因，香港中文大學的何佩然教授相信香港天文台的中文命名參考了上海徐家匯天文台，以天文台（觀測天文現象的台站）作為稱號，而非氣象台（氣象機構）。

自19世紀末期到第二次世界大戰之前，徐家匯天文台人員研究及分析了沿着中國海岸及河流建立的海關台站及燈塔的氣象紀錄及觀測。19世紀末期開始，他們採用旗幟作為颱風警告的信號。由於這些旗幟在遠處不容易分辨，後來設計了幾何形狀的信號作替代。香

information during the late 19th century. A recent paper on the Weather magazine made reference to instrumental and observation accounts of typhoons it collected for the years 1880, 1881 and 1882.

The functions of the Zi-ka-wei Observatory closely resembled those of the Hong Kong Observatory (HKO) established in 1883 by the Hong Kong government to meet the needs of the time and focussing on time service and meteorological observations. For this reason, Professor HO Pui-yin, the Chinese University of Hong Kong, considered it most likely that HKO's Chinese name, tianwentai (astronomical observatory), and not qixiangtai (meteorological institute), was adopted from its Shanghai counterpart.

From the late 19th century to before the World War II, staff at the Zi-ka-wei Observatory studied and analyzed the meteorological records and observations taken at the customs stations and lighthouses set up along the coast and rivers of China. In respect of typhoon warnings, flag signals were used since the late 19th century. Since these flag signals could not be easily identified

港天文台於1903年採用了該套稱為「中國沿岸訊號」的警告系統。及後徐家匯天文台人員於1917年採納一套新的警告系統取代該系統，而香港天文台（於1912年被頒賜「皇家天文台」的稱號，直至1997年香港主權回歸中國）隨後於1920年亦採用了該套新系統。

20世紀初期大部分時間，徐家匯天文台及香港天文台之間的聯繫，關鍵人物是富傳奇色彩的 Ernesto Gherzi神父（1886至1973年）。他是1930至1949年期間徐家匯天文台台長。在Gherzi神父主持下，上海提供了一個有效的颱風警告服務。1927年，他開展了無線電短波廣播，提供每六小時長江及華北地區七個氣象站的觀測資料。根據已故前任香港天文台台長鐘國棟先生的記載：

*「Gherzi神父為人非常實際。他對氣象學各個領域都熟悉，這類多材多藝的氣象學家已瀕*

from a distance, geometric symbols were subsequently devised to replace them. The warning system, known as the China Coast Code, was adopted by HKO in 1903. Then in 1917, the staff at Zi-ka-wei Observatory replaced the Code with a new warning system, known as the China Seas Storm Signal Code, which was later adopted in 1920 by HKO (granted the title Royal Observatory in 1912, which was used until Hong Kong's return to China in 1997).

Connecting the Zi-ka-wei Observatory and HKO during most of the early part of the 20th century was a colourful character, Father Ernesto Gherzi (1886 to 1973), Director of the Zi-ka-wei Observatory from 1930 to 1949. He operated an efficient typhoon warning service from Shanghai and was instrumental in starting a short-wave broadcast service in 1927 providing 6-hourly observations from seven stations in Yangtze and north China.

*"Fr Gherzi was very practical and belonged to the fast disappearing breed of meteorologists who are adept in all divisions of the profession. He would make an observation, broadcast it in impeccable Morse code, then receive weather reports in Morse from other stations while*

*臨絕種。他會作出氣象觀測，並完美無瑕地利用摩爾斯電碼發布資料，然後從其他台站接收天氣資料，把資料同時解碼及繪劃在天氣圖上，並且發出天氣預報及警報。有需要時他亦會修理及調校無線電接收器或發放器。他與海員及飛行員保持緊密聯絡，並經常登船探訪船長、收集他們的天氣記錄冊及與他們討論天氣。……所以，他在徐家匯天文台身兼多職–天氣觀測員、繪圖員、無線電操作員、無線電技術人員、通訊專家、天氣預報員、海港氣象主任、氣候學家、氣象學研究員，同時也是公認的公共關係主任。……Gherzi神父親自收集船隻及從其他國家拍發來的摩爾斯電報，以維持區內良好的通信標準。他會向一些不依程序或不守時的無線電操作員及氣象機構發出言簡意賅的信息，責成他們改善。」*

*simultaneously decoding and plotting them on a weather chart and issue weather forecasts and warnings. If necessary, he would repair or adjust the radio receiver or transmitter. He maintained a close liaison with mariners and aviators and frequently visited masters on their ships to collect their weather logs and discuss their experiences. ... He was thus observer, plotter, radio operator, radio technician, communications specialist, forecaster, port meteorological officer, climatologist, research meteorologist and undisputable PRO (public relations officer) in the (Zi-ka-wei) Observatory. ... By personally receiving the Morse signals from ships and other countries Fr Gherzi helped to maintain good communication standards in the region; he would send terse, admonitory notes to wireless operators or meteorological services who did not follow good practices or keep to schedules."*

Zi-ka-wei Observatory was represented at the very first regional meeting of directors of weather services which was held in Hong Kong in 1930 to decide on codes for signaling tropical cyclones and transmitting weather reports. In 1934, Fr Gherzi traveled with



圖三：1967年Gherzi神父81歲時與一船員在船上所攝
（圖片鳴謝Weather, Vol. 29, No. 5, 1974年5月）
Figure 3 : Fr Gherzi together with a seaman on board a ship
(Photograph courtesy of Weather, Vol. 29, No. 5, May 1974)

1930 年，徐家匯天文台派員參加在香港舉行的首屆區域氣象機構首長會議。該會議決定了發出熱帶氣旋警告及發布天氣報告時所用的信號及代號。1934年， Gherzi神父會同當時的香港天文台台長C.W. Jeffries先生前赴馬尼拉，與馬尼拉氣象局合力製定風暴警告的標準程序。1949年中國解放後，他在香港天文台工作了數月，隨後赴澳門，完成一套分上下冊的《中國氣象》。這是有關遠東氣候及他本人和其他人颱風經歷的一本好書。

C.W. Jeffries, Director of HKO at the time, to Manila to decide with the Manila meteorological authority on standardized storm warning procedures. With the liberation of China in 1949, he was offered a position at HKO for a few months before moving to Macau, where he finished a two-volume work on the "Meteorology of China", a good record of the climatology of the Far East and of the experiences of himself and others in typhoons.

Born in San Remo, Italy, in 1886, Fr Gherzi *"was a thin tall man with a slender high-browed head, and a narrow black beard. He wore a long black robe under which appeared two enormous black boots. He was impatient, impetuous and clever."*

Gherzi神父於1886年生於意大利San Remo市。*「他外型高瘦，面長額高，長有一把狹窄黑鬍子。他身穿一條黑色的長袍，袍下出現一雙巨大的黑靴子。他為人聰明，但性格急躁」*。他穿着的「巨大靴子」有時為人帶來幽默的題材。一位年輕不顧大體的同事曾取笑他「在黑色長袍下露出亞洲最長的腳板」。

李本瀅

2010年1月18日

His 'enormous black boots' were sometimes the butt for humour as one of his more youthful and disrespectful colleagues spoke of the 'longest feet in Asia protruding from beneath a long black cassock'.

LEE Boon-ying

18 January 2010

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# 禪
# Zen

8世紀唐朝時，有一禪師謁見禪宗祖師，須臾告辭。

*祖曰：「返太速乎？」*

*師曰：「本自無動，豈有速耶？」*

*祖曰：「誰知非動？」*

*師曰：「仁者自生分別。」*

*祖曰：「女（汝）甚明得無生之意。」*

*師曰：「無生豈有意耶？」*

*祖曰：「無意誰當分別？」*

*師曰：「分別亦非意。」*

*祖曰：「善哉！善哉！…。」*

這一段話講的是中國禪宗中所謂機鋒。禪宗是菩提達摩從印度傳到中國，在中國發揚光大的一個佛教宗派，最富中國色彩。上述的祖師是六祖慧能（公元638至713年），對談後高呼禪師悟得大道。慧能是「頓悟」的奠基人。

In 8th century Tang Dynasty, a Zen master went to see a patriarch, and soon bade farewell.

*"Are you returning too soon?", said the patriarch.*

*"Fundamentally I haven't moved. How come you say it's too soon?", replied the master.*

*"Who knows you haven't moved?"*

*"Your venerable can draw a distinction."*

*"You clearly understand the meaning of 'no beginning' ", remarked the patriarch.*

*"Is there a meaning to 'no beginning' ?", asked the master.*

*"Why draw a distinction if there is no meaning?", said the patriarch.*

*"Any distinction has no meaning", replied the master.*

*"Wonderful! Wonderful!", exclaimed the patriarch at the master's enlightenment.*

This is my poor attempt at translating a parrying of words common in Zen in China. Zen was brought in by Bodhidharma from India. It flourished and developed and became indigenous to China. The patriarch was the 6th Patriarch, Huineng (638 to 713 CE), the founder of 'sudden enlightenment'.



禪宗六祖慧能（參考資料：http://sites.google.com/site/terrycomic2/liu2）
6th Patriarch Huineng (Reference : http://sites.google.com/site/terrycomic2/liu2)

有關他的事跡，我們較為熟知是他初入佛時聽到羣僧讚頌：

*身是菩提樹，*
*心如明鏡台，*
*時時勤拂拭，*
*莫使惹塵埃。*

慧能當時不懂寫字，於是着人寫下：

*菩提本無樹，*
*明鏡亦非台；*
*本來無一物，*
*何處惹塵埃？*

後來獲授衣缽為禪宗六祖。他的一個弟子將其思想寫成《證道歌》。涅槃後他的遺體現在仍存於廣東韶關一寺廟。耶穌會教士利瑪竇（見2010年1月18日網誌）於1589年曾參觀該寺，並將慧能的故事介紹到西方。

He was best known for his response when, as a junior monk at the time, he heard monks chanting the verse:

*The body is a Bodhi tree,*
*the mind a standing mirror bright.*
*Polish it all the times,*
*And let no dust alight.*

Being illiterate, he asked someone to write his own verse:

*Bodhi originally has no tree,*
*and the bright mirror is no stand.*
*There is nothing to start with.*
*Where could dust arise?*

Huineng later became the 6th Patriarch of Zen buddhism. His thoughts are reflected in the "Song of Enlightenment" written by one of his disciples. The mummified body of Huineng is still kept in a temple in northern Guangdong (south China), and was seen by the Jesuit Matteo Ricci (see the blog of 18 January 2010) who visited the temple in 1589. Ricci later

《證道歌》中的思想對印度人可能是陌生的。因而《證道歌》於唐玄宗時期（8世紀）傳回了印度，為該處人士所「親仰」。

這樣的佛教思想「回流」並非罕見。同樣地，歷史上科技的回流更數不勝數（採取的地理路線通常也是一樣）。隨便一些例子，可見2009年10月2日有關《糖的故事》，或 2009年4月24日有關中東科技盛世的網誌。

今日，知識及資訊的傳播無遠弗屆。以氣象界為例，一年365日全球氣象單位每天均多次互換最新資料，從不間斷，有些資料甚至是實時的。這些頻密的交流令氣象單位能盡早準確地發出預測和警報，以保障市民安全。

李本瀅

2010年1月27日

introduced the story of Huineng to Europe and named him ‘Lusu’ (the 6th Patriarch).

The thoughts of Huineng must have been new to India. Subsequently the “Song of Enlightenment” was brought back to India in the 8th century and was revered.

Such 'reverse' transfer of buddhism thoughts was only one of many in the history of buddhism. The same can be said of the transfer of technological knowledge in history (often along the routes as the movement of buddhison thoughts). See, for example, the blog of 2 October 2009 on “The Story of Sugar” and that of 24 April 2009 on the heyday of Middle East science.

Nowadays, knowledge and information are transferred more rapidly and in many directions, across oceans and continents. In particular, the latest meteorological information is exchanged between weather centres many times a day, some even in real time. This enables these centres to issue weather forecasts and warnings in a timely and accurate manner, in their effort to ensure public safety.

LEE Boon-ying

27 January 2010

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# 氣候變化的疑問（一）－迷你冰河時期？

# Climate change queries (1) - Mini ice age ?

在2009年12月及2010年1月侵襲北半球中緯度大部分地區的暴風雪吸引了不少媒體的注意，加上有報告指北極海冰自2007年開始增加及一些對氣候年代際變化的科研討論，令「迷你冰河時期」一詞在外國報章出現並迅速為本地傳媒廣泛報導，對「全球變暖」的可信性產生疑問。在此我嘗試解答這些疑問。

**什麼是迷你冰河時期？**

「冰河時期」是指冰蓋（冰川）在世界各地廣泛形成並持續的一段長時期（以百萬年計）。「小冰河時期」一詞也曾用來描述在14至19世紀北

The furious snowstorms that battered much of the mid-latitude region of the Northern Hemisphere in December 2009 and January 2010 have drawn much attention from the media. Bundled with the report of an increase in Arctic sea ice since 2007 and some research discussions on the decadal variations in climate, a new phrase ‘mini ice age’ emerge from an overseas news article and was widely reported in the local media, raising queries about the credibility of 'global warming'. I shall attempt to answer these queries.

**What is a 'Mini Ice Age' ?**

The term 'ice age' generally refers to a long period of time (millions of years) during which extensive ice sheets (glaciers) formed over many parts of the world. Another term, 'little ice age', has also been used to describe a modest cooling of the Northern Hemisphere

半球的一段寒冷時期，但這並不是真正的冰河時期，因為該段時期的寒冷程度和持續時間還未能令冰蓋在世界各地大範圍地出現。相形之下，2009年末及2010年初的寒潮持續時間更短，冰蓋的覆蓋範圍更小，故使用「冰河時期」來形容現在這段時期實有欠妥當。

「迷你冰河時期」一詞首先在今年1月10日的一份英國報章中出現，但這個詞語從未在該報引述的研究學者的論文報告或演說中出現。事實上，該學者只是指出（在互聯網上）近期的冷卻情況，「可能會在未來十年間抵消全球變暖的影響」及「現在還不太確定全球變暖的短期演變情況」。此外，他亦說「我們均認為，假如我們未能大力減少溫室氣體排放，長遠來說，或者在2050年及以後，地球會明顯較現時溫暖」。

roughly from the 14th to 19th century, but this was not exactly a 'ice age' as it was not cold enough and long enough to cause extensive ice sheet cover. The recent cold spell in late 2009 and early 2010 is even shorter, not to mention the limited ice cover, and the use of 'ice age' to describe it is clearly inappropriate.

The name 'mini ice age' came from a U.K. newspaper published on 10 January this year and did not appear in either the paper or the speech of the relevant researcher. Indeed, the researcher merely pointed out (on the Internet) that the present cooling "may offset global warming for a decade" and "there is quite some uncertainty about the short-term evolution (of global warming)". Further, he said "we all agree that in the long run, say by 2050 and thereafter the earth will considerably warm, if we do not considerably reduce global greenhouse gas emission."

At this point, it should be clear that the cold spell occurring in late 2009 and early 2010 is 'weather' and has nothing to do with the 'climate'. Climate refers to a period of at least 30 years according to the World Meteorological Organization.

至此，在這裡我們應該清楚明白到2009年末及2010年初的寒潮只是「天氣」，而不是「氣候」。根據世界氣象組織的定義，氣候是不少於30年的平均天氣。

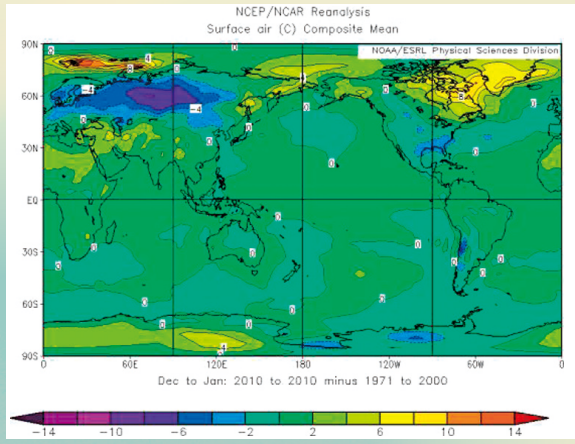
**世界其他地方的天氣和香港的寒冷天氣究竟怎樣？**

近期的寒冷天氣主要影響歐洲、歐亞大陸、中國北部及北美洲等地。相反，在其他地方，例如在北極部分地區，氣溫較平均高10℃或以上。在北半球熱帶地區及南半球大部分地區的氣溫也高於平均值，而澳洲南部最近的氣溫更高達40℃以上。在本港，雖然我們在2009年11月發出了最早的寒冷天氣警告，而且2009年12月也較正常清涼，但從整年來看，2009年的天氣仍然異常溫暖，是自1884年有記錄以來第九最溫暖的年份。儘管我們在2010年1月也曾發出寒冷天氣警告，但該月的平均

**What about the weather elsewhere and the cold weather in Hong Kong ?**

The recent cold weather affected mainly Europe, Eurasia, northern part of China, and North America. Elsewhere, temperatures of some places in the Arctic were warmer than the normal by 10°C or more. The tropics in the Northern Hemisphere and large areas in the Southern Hemisphere had above normal temperatures. Temperatures in southern Australia recently went above 40°C. Locally in Hong Kong, although we had the earliest cold weather warning issued in November 2009 and December 2009 was cooler than normal, the weather as a whole was exceptionally warm for 2009 which ranks the 9th warmest year since records began in 1884. Despite the issuance of cold weather warnings in January 2010, the monthly mean temperature of 16.8°C is 0.7°C above normal. The recent cold weather in some regions of the Northern Hemisphere should be considered as part of the normal short-term variations in the weather.






圖一：2009年12月至2010年1月的全球表面氣溫距平（與1971至2000年的平均值的差距）
（圖片來源：NOAA/OAR/ESRL PSD, Boulder, Colorado, USA, http://www.esrl.noaa.gov/psd/）
Figure 1 : Global surface temperature anomaly (difference from 1971 to 2000 average) for the period from December 2009 to January 2010
(Image source : NOAA/OAR/ESRL PSD, Boulder, Colorado, USA, from their Web site at http://www.esrl.noaa.gov/psd/)

氣溫（16.8℃）仍較平均值高0.7℃。所以，近期北半球部分地區的寒冷天氣可視為正常的短期天氣變化的一部分。

**為什麼會出現寒冷天氣？**

造成2009年末及2010年初的寒冷天氣有多個成因。根據部分科學家的說法，其中一個可能的原因是北極濤動在這段時間處於強負位相。簡單來說，北極濤動是指北半球中緯度地區（大約是北緯45度）與北極之間氣壓差的變化。當北

**What are the causes of the cold weather?**

Various factors could contribute to the cold weather in late 2009 and early 2010. According to some scientists, one of the possible causes is the Arctic Oscillation's strong negative phase during the period. In short, the Arctic Oscillation (AO) refers to variations in the difference in the atmospheric pressure in northern mid-latitudes (about 45 degrees North) and the Arctic. In the negative phase, weather patterns in the Northern Hemisphere are more

極濤動處於負位相時，北半球的天氣形勢有利於北極的冷空氣向南侵襲。而在正位相時，天氣形勢大致上和負位相時相反，某程度上限制了冷空氣向南擴展。從過去60年的北極濤動資料（圖二）可以看到，2009年的情況不是太不尋常。

**我們應如何理解這些激烈的天氣變化？**

雖然雪災和嚴寒天氣是極端天氣事件，但這些事件都只是自然氣候的一部分。聯合國政府間氣候變化專門委員會在2007年指出，全球變暖令氣溫有長期上升趨勢，而在過去數十年間極端寒冷事件的出現次數則日漸減少，預料極端寒冷事件的出現機會將隨全球氣溫上升而進一步下降。

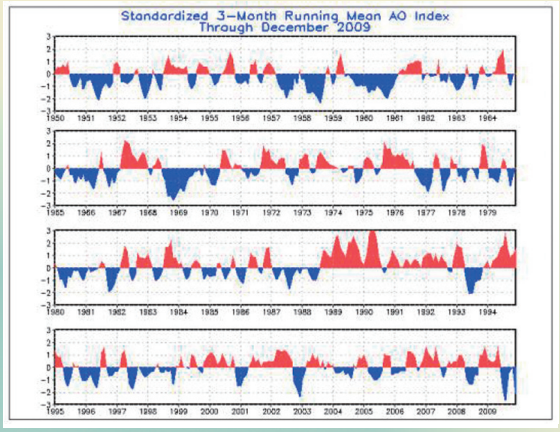
在香港方面，我回想起2008年1、2月間香港經歷了40多年來首次連續24天的氣溫降至12℃或以下的情景，但2009年2月卻是自1884年有記錄以來

favourable for the outbreaks of frigid air from the Arctic. Patterns in the positive phase are in general opposite to those of the negative phase, somehow restricting the cold Arctic air from spreading south. Information about the AO over the past six decades (Figure 2) suggests that there is nothing very unusual for the year 2009.

**How do we interpret all these wild fluctuations in weather ?**

Snowstorms and very cold weather are extreme events. However, such events are part of variable natural climate. The United Nations Intergovernment Panel on Climate Change pointed out in 2007 that temperatures are rising in the long term and that as a result of global warming, extremely cold events have become less frequent over the past few decades. These events are expected to decrease further as global temperatures continue to rise.

For Hong Kong, one thing that comes to my mind is that in January/February 2008 we had, for the first time in over 40 years, 24 days in a row having temperatures falling to 12°C or below, while in 2009 we had the warmest February since records began in 1884.




圖二：1950至2009年間北極濤動指數的3個月移動平均值
（圖片來源：氣候預測中心，美國國家海洋及大氣管理局）
Figure 2 : 3-month running mean of Arctic Oscillation Index from 1950 to 2009
(Image source : Climate Predication Center, NOAA)

最溫暖的2月。在過去10個最溫暖的2月中，有6個是在1990年以後出現的。現在我們還不能百分百確定地說每一個極端天氣事件都與氣候變化有關，但冷暖天氣的巨大差別則肯定會令我們感受到氣候變化在長遠未來可能帶來的影響。

李本瀅

2010年2月12日

6 out of the 10 warmest February in Hong Kong occurred after 1990. While we still cannot say with certainty that each of these extreme events is related to climate change, the wild swing in hot and cold surely gives us a flavour of what climate change may bring in the long run.

LEE Boon-ying

12 February 2010

# 氣候變化的疑問（二）－北極海冰與喜馬拉雅山冰川

# Climate change queries (2) - Arctic sea ice and Himalayan glaciers

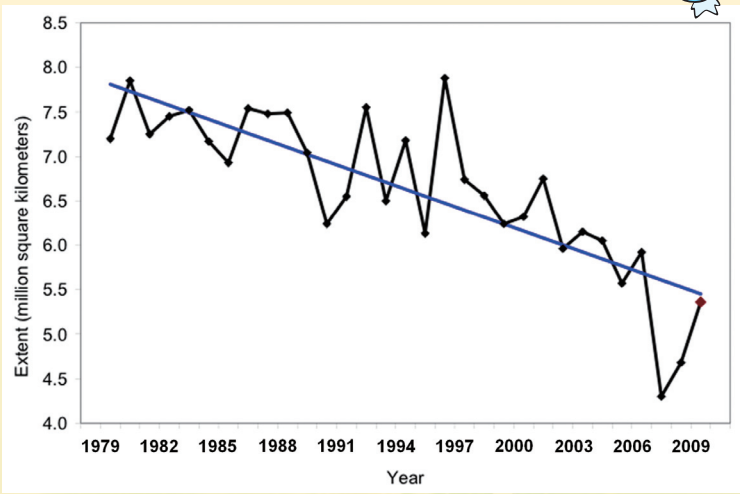


**在全球暖化的背景下，為何近期北極海冰的覆蓋面積卻在增加？**

雖然2008及2009年夏季的北極海冰覆蓋面積較2007年9月時的最低記錄為大（圖一），但是面積仍低於長期平均值，並在過去數十年間有明顯減少趨勢。根據美國國家冰雪數據中心的資料顯示，自1979年有記錄以來，2009年的海冰覆蓋面積是歷來排名第三最小，而且面積最小的五個年份均在過去五年間出現。

**With global warming, how come there is recently a rise in sea ice coverage in the Arctic?**

Although the Arctic summer sea ice extents in 2008 and 2009 were greater than that of the record low in September 2007 (Figure 1), the sea ice extents were still well below the long-term average and the decreasing trend in the last few decades is significant. According to the U.S. National Snow and Ice Data Center, the sea ice extent for 2009 was the 3rd lowest and the past five years have seen the five lowest ice extents since the start of records in 1979.



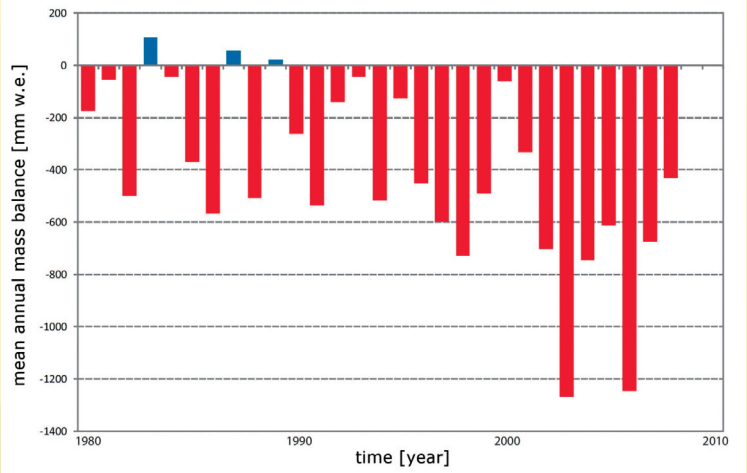

圖一：1979 至2009年夏季（9月）的北極海冰月平均覆蓋面積
（數據來源：美國國家冰雪數據中心）
Figure 1 : Average monthly Arctic sea ice extent - summer (September) from 1979 to 2009
(Data Source: U.S. National Snow and Ice Data Center)

**喜馬拉雅山冰川的溶化情況是怎樣？**

最近，聯合國政府間氣候變化專門委員會（IPCC）承認在2007年發表的評估報告（第二工作組部分）中提到喜馬拉雅山冰川的後退速率及估計消失時間並沒有足夠的科學證據支持，這個錯誤是由 IPCC 的科學家自行指出的。雖然如此，現時證據仍然顯示喜馬拉雅山和世界各地的冰川正在溶化，以及全球變暖是一個事實並且很有可能是由人類造成的。

**What about the melting glaciers in the Himalayas ?**

Intergovernment Panel on Climate Change (IPCC) recently admitted that the rate of retreat and the estimated disappearance date for Himalayan glaciers (in the Working Group II contribution of the IPCC Assessment Report in 2007) were poorly substantiated. The mistake was however pointed out by scientists themselves. Evidence still shows that Himalayan glaciers and other glaciers around the world are melting and that global warming is real and very likely man-made.




圖二：1980 至2008年參考冰川的冰川物質平衡〔註〕之年平均值。
正值以藍色表示，負值以紅色表示。
（數據來源：世界冰川監測服務：冰川物質平衡初步數據 2007/2008；
http://www.geo.unizh.ch/wgms/mbb/sum08.html）

Figure 2 : Mean annual mass balance (Note) of reference glaciers from 1980 to 2008 with positive values in blue and negative values in red.
(Data Source : World Glacier Monitoring Service: Preliminary glacier mass balance data 2007/2008 http://www.geo.unizh.ch/wgms/mbb/sum08.html)



圖二顯示總部設在瑞士的世界冰川監測服務最新公佈之全球冰川融化結果。該組織指出，整整一世紀有系統的觀測數據清楚顯示了全球冰川減縮的普遍趨勢。

預料世界各地的冰川及冰帽（不包括位於格陵蘭及南極洲的冰蓋）溶化，會令全球海平面到2100年時上升10至25厘

The latest global results of glacier melts are presented by the Switzerland-based World Glacier Monitoring Service (WGMS) in Figure 2. WGMS pointed out that one century of systematic observation clearly reveal a general shrinking of mountain glaciers at a global scale.

The melting of the glaciers and ice caps (excluding Greenland and Antarctica) is expected to add about 10 to 25 cm to sea level by 2100. The other main



米。另一個導致全球海平面上升的主因是海水受熱膨脹。即使假設我們立即停止一切排放活動（例如：電力生產、工業活動及交通工具使用等），過往已排放到大氣中的二氧化碳仍會使全球氣溫再上升約0.6℃，這亦會令海水的溫度上升並膨脹，使海平面進一步上升。近期研究指出，視乎排放情景，到2100年時單單因水溫上升，海水受熱膨脹，便會使海平面高度上升20至50厘米，遠大於冰川和冰帽溶化所帶來的影響。

**IPCC的結論可信性有多少？**

IPCC在2007年的評估報告指出現時所經歷的氣候變化「很有可能」是人類活動造成的。所謂「很有可能」是指有百分之九十的可能性，而不是百分之百肯定。雖然不太完美，但不確定性在科學發展道路上一直存在。

那麼這些事情讓我們明白到什麼？我們應小心理解一些

contributor to global sea level rise is the thermal expansion of ocean water. Even if all emissions (e.g. electricity generation, industrial activities, and transportation) stop tomorrow, global temperatures are expected to rise about 0.6°C because of the latent effects of carbon dioxide already emitted into the atmosphere. This would have a knock-on effect on ocean water, i.e. ocean water will warm up and expand further. Depending on the emission scenarios, a recent study indicated that thermal expansion of ocean water alone would raise the sea level by about 20 to 50 cm by 2100. This is far greater than that brought about by glacier and ice cap melts.

**How sure are the conclusions of IPCC?**

IPCC pointed out in 2007 that the climate change we are witnessing is 'very likely' a result of anthropogenic (i.e. human) activities. By 'very likely' it meant a certainty of 90%, not 100%. Though less than perfect, this is in fact consistent with the history of science development.

So what do all these lead us to? We need to be careful about interpreting short-term changes. They have to be assessed against the long-term trend. Do not confuse the weather, which is short-term, with the

短期變化，作出分析時應以長期變化趨勢為依歸。此外，我們亦不要將天氣（短期變化）及氣候（不少於 30年的天氣平均狀況）兩者混淆。最後，我們也不要因單單一個錯誤，便完全否定 IPCC 2007年評估報告的所有內容。因為到目前為止，只有大氣中二氧化碳的濃度上升這個原因，才能解釋觀察到的多個氣候變化現象，包括全球變暖、冰川冰帽溶化及海平面上升等。

李本瀅

2010年2月24日

climate, which is long-term and has to be based on at least 30 years of record. Last, don't be blinded by a single mistake in the IPCC 2007 report. So far, only the rising level of carbon dioxide in the atmosphere can explain such observed phenomena as global warming, melting of glaciers and ice caps, and the rising sea level.

LEE Boon-ying

24 February 2010



註：「冰川物質平衡」是指冬季冰雪積累量和夏季冰雪消融量的相差值。其單位為毫米水當量（millimetre of water equivalent（mm w.e.））。正值的物質平衡表示冰川體積上升，而負值則意味著冰川的體積下降。

Note : 'Glacier Mass Balance' is determined by the difference between the amount of snow and ice accumulated in winter and the amount of snow and ice removed by melting in summer. The unit is in millimetre of water equivalent (mm w.e.). A positive value of the mass balance implies the glacier has increased in volume while a negative value indicates the glacier volume has decreased.

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# 香港的氣溫測量站

# Temperature Measurement Stations in Hong Kong

時值新春，借杜甫詩句*「好雨知時節，當春乃發生。隨風潛入夜，潤物細無聲。」*，甘露滋潤萬物之際，祝願各位讀者新年進步，欣欣向榮。

**虎年遇上寒潮**

香港剛剛渡過一個頗為寒冷的農曆新年，在天文台尖沙咀總部的每日最低氣溫由年初一（2月14日）的14.6℃下降至初六（19日）的7.7℃，而荃灣和九龍城的最低氣溫更分別只有5.3℃和5.9℃，比打鼓嶺的 6.0℃更低。

**市區比新界還要冷？氣象站選址有問題？**

傳統概念是新界氣溫在冬天要比市區為低，今年新年期間的氣溫情況是否代表這概念

Spring has always been a season dear to people's heart. The famous Chinese poet Dufu (Tang Dynasty, some 1,300 years ago) wrote a poem to celebrate the arrival of Spring : *"The good rain knows its season. When spring arrives, so does the rain. In the dark of the night, it comes quietly with the gentle breeze, nourishing all life on Earth, without a fanfare."* At a time when spring has just started and when we are blessed with the auspicious rain, I wish all of you a happy and prosperous New Year.

**The Year of the Tiger commenced with a cold surge**

Hong Kong experienced a rather cold Chinese New Year. The daily minimum temperature at the Observatory headquarters at Tsimshatsui dropped gradually from 14.6°C on the first day of the New Year (14 February) to 7.7°C on the 6th day of the New Year (19 February). In Tsuen Wan and Kowloon City, the lowest temperatures recorded were 5.3°C and 5.9°C respectively, both colder than the 6.0°C at Ta Kwu Ling.

有需要改變？

過去兩年，打鼓嶺 、石崗（市郊）、荃灣和九龍城（市區）在冬季（12月、1月及 2月）的平均最低氣溫分別為12.7℃、13.5℃、13.9℃及14.7℃，反映新界平均比市區較為寒冷的客觀事實。在晴朗、少雲和微風的晚上，打鼓嶺和石崗由於較為空曠，附近建築物稀疏，像少蓋了毯子一樣，有利地面的熱量流失（氣象學上稱為輻射冷卻），故此一般較市區氣溫為低。但由於農曆年底（2月12日）已經開始的寒潮帶來長時間天陰、間中有雨的天氣，輻射冷卻因素沒有出現。在持續北風影響下，大氣混和較為均勻，市區與郊區溫度的差距拉窄。

是次寒潮凸顯的一個因素是氣象站的高度。荃灣站是眾多市區站中最高的一個站，海

**Is the urban area colder than the New Territories ? Are there problems with the sites of weather stations?**

People in Hong Kong have in mind the fact that in winter, the New Territories is colder than the urban areas. Do the temperature records during the Chinese New Year suggest that this is no longer valid?

Let's take a look at the average minimum temperature at Ta Kwu Ling, Shek Kong (rural areas), Tsuen Wan and Kowloon City (urban areas) during the past 2 winters (December, January and February). They are respectively 12.7°C, 13.5°C, 13.9°C and 14.7°C. The fact remains that the New Territories is on average colder than the urban areas. During fine winter nights when there are little clouds and the winds are light, Ta Kwu Ling and Shek Kong have lower temperatures. This is because the places are less built up and more exposed. Like having a blanket pulled away, any heat at the ground is easily lost (through a process known as radiation cooling in meteorology). However, the cold surge that began before the New Year's eve (on 12 February to be exact) brought long periods of overcast weather and occasional rain to Hong Kong. The mechanism of radiation cooling did not come



圖一：荃灣區氣溫站設於大帽山腰的可觀自然教育中心暨天文館

Figure 1: The temperature station at Tsuen Wan is sited at Ho Koon Education Center near the foot of Tai Mo Shan

拔142米，而九龍城站則為92米。根據氣溫平均每上升100米下降約0.6℃的規律推算，荃灣站和九龍城站與海平面的氣溫相差分別約為0.9℃及0.6℃，均少於1℃，因而有一定的代表性。

綜合上述兩個因素，兩站在是次寒潮中比較市區及其他近海平面站氣溫稍低，但不失其對市民的參考價值。

其實，氣象站的選址是較為複雜的課題，有需要在氣象

into play. Rather, under persistent northerlies, the atmosphere was quite well-mixed, making the temperature difference between the rural and urban areas insignificant.

One factor that was highlighted during this cold spell was the height of the weather stations. Tsuen Wan and Kowloon City, at 142 and 92 metres above mean sea level respectively, are the highest stations in the urban area. Based on the an average temperature fall of about 0.6°C for a rise of 100 metres, Tsuen Wan and Kowloon City are cooler by 0.9°C and 0.6°C respectively compared with the sea level, i.e. cooler by within 1°C. Temperatures at these two stations are thus representative of the respective areas.

科學與提供氣象服務兩者不同的要求之下取得平衡。從科學的角度，理想的溫度測量站應符合一系列條件，包括溫度計不能暴露於陽光、地表應平坦，並植以短草、環境應不受高樓大廈、以及人為熱源的影響等。這樣，測量的溫度數據才可代表一個區內天氣元素的特徵。

在香港，由於城市高度密集的發展，理想的測量站是十分難求的。為了滿足市民對氣象資訊的需求，我們在一些相對符合基本的建站條件的地點建站，未必能盡善盡美。選址時要照顧到場地的開敞程度、場地保安以及人員進行儀器維修的方便程度等非氣象因素。

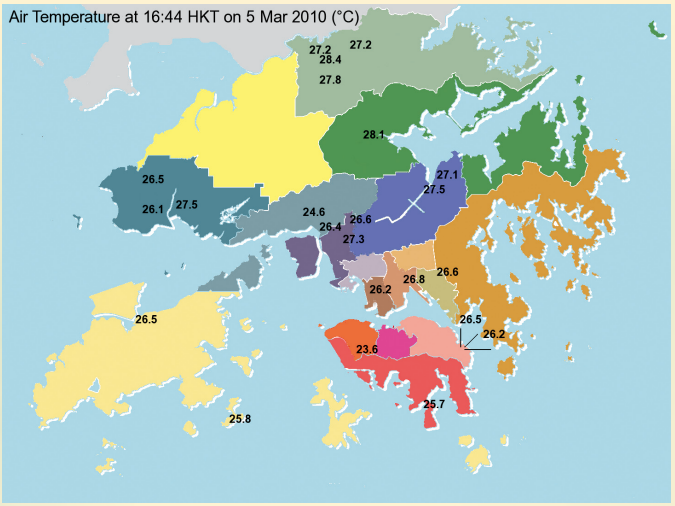
**滿足市民對區域天氣資訊的需求**

由於香港地形複雜，各處地方城市化程度不同，人

Because of the two factors described above, the Tsuen Wan and Kowloon City stations registered slightly lower temperature than other stations in the urban area as well as other stations near the mean sea level. Nonetheless, their readings are still useful references to the public.

As a matter of fact, choosing a site for a weather station is a complicated issue. A balance has to be struck between complying with the strict requirements of meteorological science and the perspective of providing weather services to the public. From the scientific point of view, an ideal temperature station should fulfill a number of conditions. For example, the temperature sensor should not be exposed to direct sunlight, the ground should be level and covered with short grass, the adjacent environment is one that is not affected by nearby buildings or artificial heat sources. The temperatures measured this way are considered to be representative of the district.

In Hong Kong, because of rapid development and urbanization, sites ideal for temperature measurement are hard to come by. To meet the information needs of the public, stations have to be established in sites which are less than perfect, but nonetheless




圖二：部份「社區天氣資訊網絡」自動氣象站的實時氣溫
Figure 2 : Some real-time temperature readings from automatic weather stations of the Community Weather Information Network

口分佈亦各處相異，氣溫在不同區域都有出入。故此，我們在2007年開展「一區一站」的工作，目標是全港十八區每區最少有一個量度氣溫的自動站。今年3月，這項工作已經完成。除此之外，2007年我們亦伙拍香港理工大學及聯校氣象網建立「社區天氣資訊網絡」，協助學校及團體建立自動氣象站，並將收集到的天氣資料透過互聯網

meet the basic requirements. These basic requirements include station exposure, and other non-meteorological factors such as site security and easy access for maintenance.

**Meeting public needs for regional weather information**

Because of the complex terrain in Hong Kong, and the different population and degree of urbanization, the temperatures at the districts are bound to vary. For this reason, we embarked upon a 'One District One Station' project in 2007 to provide at least one temperature station in each of the 18 districts in Hong Kong. This project was completed in March this year. We have also partnered

（http://weather.ap.polyu.edu.hk/index_c.php）發放給全港市民。市民足不出戶，便可以參考額外數十個自動氣象站的即時氣溫和天氣資訊。

李本澄，梁榮武

2010年3月10日

with the Hong Kong Polytechnic University and the Joint School Meteorological Network to set up a Community Weather Information Network (Co-WIN). We help schools and organizations to set up weather stations of their own, and the weather data collected are displayed on the internet for the benefit of the public. A few clicks (http://weather.ap.polyu.edu.hk/index.php) will take you to real-time weather information from dozens of Co-WIN members in various parts of Hong Kong.

LEE Boon-ying, LEUNG Wing-mo

10 March 2010

# 風險管理
# Risk management

風險管理在現今並不只是一個常用的名詞。常見的活動如投資、保險及財經等均涉及不同程度的風險管理。

世界部份地區，尤其是北美洲，在提供天氣服務時採用了概率預報的方法，譬如說在日常預報中提供下雨的概率。這一些預報對需要做決定或在業務中運作決策模式的人有幫助，例如在港口及客貨運終點站。概率預報亦可用來決定是否進行戶外活動，例如進行燒烤或體育活動。我們可以根據成本效益來評估一項活動受下雨影響的風險。例如，可以在得悉下雨的機會後，評估在晴朗及下雨兩個情景下進行的相對成本，從而作出最後決定。

大家可能未注意的是，現時預報颱風的工作在某程度上已越來越多採用風險管理的概

'Risk management' is not just a popular term these days. It is actually practiced in many areas --- in investment, insurance and finance, just to name a few.

In the provision of weather service, probability forecast is being issued in some parts of the world, notably North America. For instance, the probability of rain is routinely given. Such a forecast is useful to decision makers or those who operate a decision model in their operations, e.g. ports and terminals. It can also be used in deciding on an outdoor activity, e.g. a barbecue or sports event. The risk of an event being ruined by rain can be managed through a cost-benefit analysis. For instance, people can make up their mind after knowing the chance of rain and evaluating the relative cost between a dry and a wet programme for the event.

Not many people are aware that some kind of risk management is now being increasingly adopted in typhoon forecasting. Since the early 2000s meteorologists found that with advances in the numerical prediction of tropical

念。自2000年代開始，隨着數值方法預報熱帶氣旋的進步，我們可以利用一個名為「多模式結合」的方法減低預報颱風路徑的誤差。這一個方法根據歐洲、日本及美國主要氣象中心全球模式所產生的風暴預報位置運作。事實上，天文台同事的研究工作顯示，簡單計算各個氣象中心的風暴預報位置的平均值，便可以明顯地改善颱風路徑的預報，整體上比較只採用其中任何一個模式作出的預報為佳。

圖一是颱風巨爵於2009年9月威脅香港時其路徑預報的例子，天文台需要發出8號烈風或暴風信號：

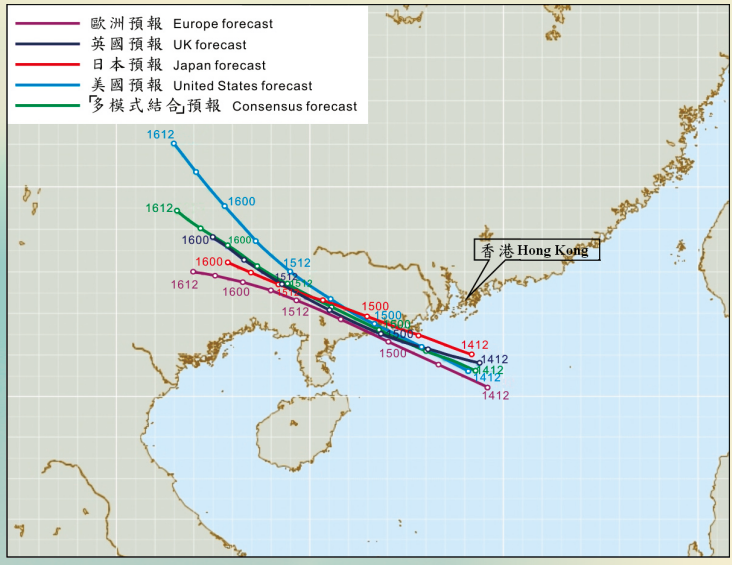
這個方法之有用，大前提是各個獨立的全球模式要達到某程度上的準確性。假使一個模式預報風暴向東移動，而另一個模式預報風暴向西移動，則製成的「結合」預報意義不大。

cyclone, it is possible to minimize the forecast error in a typhoon track by a 'multi-model consensus' approach. The approach takes account of the predicted storm positions generated by global numerical weather prediction (NWP) models run by major weather centres in Europe, Japan and the United States. As a matter of fact, research work by Observatory colleagues indicates that even a simple average of these predicted storm positions would produce a significant improvement in typhoon tracking, in general better than the tracking by any individual model.

Figure 1 is an example of tracking of Typhoon Koppu when the storm threatened Hong Kong in September 2009, necessitating the issuing of the No. 8 Gale or Storm Force Wind Signal:

For the approach to be useful, the performance of the global models individually has to be reasonably good in the first place. There is little point in producing a 'consensus' if, as an idealized example, one model takes the storm to the east while another takes it to the west.

Several years of experience with the multi-model approach suggests that it is more than risk management – it brings




圖一：颱風巨爵於2009年9月14日協調世界時1200時（香港時間下午8時）各主要氣象中心的預報路徑（圖中1512代表9月15日協調世界時1200時的預報位置，如此類推）

Figure 1 : Forecast tracks of the various major weather centres of Typhoon Koppu for 1200 UTC (8 p.m. Hong Kong Time) on 14 September 2009
(The label 1512 represents fhe forecast position for 1200 UTC on 15 September, etc.)

我們從過去幾年利用「多模式結合」預報的經驗顯示這項工作不單只是管理風險 — 隨着電腦模擬天氣科學上的進步，多模式預報顯著地提高了颱風預報的準確度。

歷史上有不少關於風險管理的例子，這裡可試舉宗教歷史上的一兩個例子。道教是中國的一個土生土長的宗教及哲學，

about significant improvement in typhoon tracking as a result of scientific advances in computer modeling of the weather.

There is no lack of risk management in history. I can name a couple of examples in the history of religion. In the incipient days of Buddhism in China about 2,000 years ago, it was not uncommon to see Buddhist deities in Taoist temples, Tao being an indigenous religion and philosophy in China. In those days, one could also see figures of Confucius featuring in Buddhist

但在約兩千年前，佛教在中國開始萌芽時，在道教廟中看見佛教的神像並不鮮見。那時，佛教及道教廟宇中甚至可見到孔子像。為求立足中國，佛教僧侶亦須要勤習儒、道之學。

出現上述情況的一個原因是漢族不能算是一個宗教性很強的民族。他們認為在廟宇內放置多一些神像並沒有壞處，於是寧縱毋枉。那些在道教廟宇中的佛教神像正好反映當時的僧侶矢志要在宗教「市場」上分一杯羹。沒有其他方法比這方法更好、更能混入信眾常到的地方。

在西方社會，英國東盎格魯的雷沃德國王（於公元 624 或 625 年逝世）曾興建兩座祭壇，一座為當地的神靈、另一座為基督教。傳說中他這樣做是為了「雙重保險」，以防本土宗教的神祇們不事事靈驗。英國約於公元670年正式接受基督教為國教。

and Taoist temples. To get a firm foothold in China, Buddhist monks were also asked to study Confucian and Taoist teachings.

One reason for this was that Chinese people are not strongly religious. In their mind, there was perhaps no harm in including more deities in the temple lest they upset those being left out. That Buddhist deities could be found in Taoist temples reflected the monks' effort at the time to get a share in the religious 'market'. What better strategy it was than to 'infiltrate' temples that believers normally went.

In the western world, King Redwald (died 624 or 625 AD), of East Anglia in England, built two altars, one for indigenous gods and one for Christianity. It was said that he did this as a 'double insurance', a way to safeguard against oracles not going well. England fully adopted Christianity by around 670 AD.

The concept of risk management equally applies to the issue of climate change. Recently, there has been increasing media coverage on scepticism about the work of the Intergovernmental Panel on Climate Change (IPCC, the Nobel prizewinner for peace), and on the science

風險管理的概念同樣可以應用在氣候變化議題上。最近，傳媒對政府間氣候變化專門委員會（諾貝爾和平獎得主）的工作和氣候變化的科學理據存疑的報導有所增加。雖然，政府間氣候變化專門委員會的報告出現了兩三點不小心的錯處，但是，氣候變化背後的科學理據明確，而所達致的重點結果是經過科學家們作出大量研究及嚴謹論証所達到的。

政府間氣候變化專門委員會的報告一直以來已指出，九成機會可以肯定全球暖化是人類活動所帶來的。這一個肯定性，或者可以說成一成機會的不肯定性，在科學領域上是頗為常見的。對於決策者來說，在計劃未來時最好要留意這一點。如果僅僅是為了報告書中的一些輕微錯誤而不理會其重點結果，是不利和不明智的。

李本澄

2010年3月22日

of climate change in general. While there has been some carelessness in a couple of places in the IPCC report, the science behind climate change is sound and the rigour in the studies and arguments leading to the key results are strong.

The IPCC report points out, all along, that it is 90% certain that global warming is brought about by human activities. Such certainty, or 10% uncertainty if you like, is quite normal in the field of science. For the decision maker, he or she would be wise to bear this in mind when planning their way forward. It would not be wise, and certainly not in their best interest, not to take account of the key results in their decisions simply because of some minor mistakes in the report.

LEE Boon-ying

22 March 2010

# 歲月神偷
# Echoes of the Rainbow



圖一
Figure 1

獲得國際獎項的《歲月神偷》電影不單只為很多香港人帶來懷舊心情，它亦有一些科學小知識。事實上，這電影的英文名“Echoes of the Rainbow”相信是根據彩虹眾多有趣特徵之一而取的。

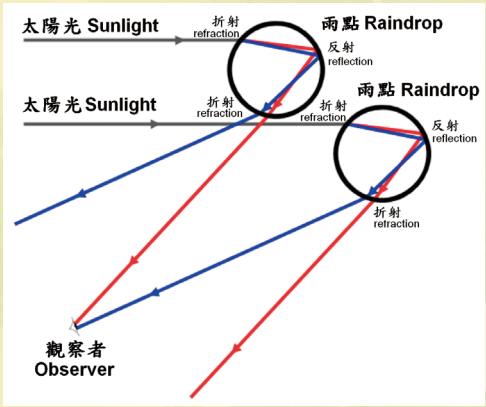
電影裏提及偶爾會看到雙彩虹，而副虹的顏色次序跟主虹是剛相反的。

The international award-winning movie "Echoes of the Rainbow" does not just bring nostalgia to many Hong Kong people. It also includes some science tidbits. In fact, it is one of the rainbow's many interesting characteristics that apparently gives the movie's namesake.

In the movie, it is mentioned that once in a while you can see a double rainbow, and the sequence of colours in the secondary bow is the reverse of the primary.

圖二解釋主虹的現象。彩虹上每一個色帶分別是多個雨點不同位置經反射及折射後形成的。

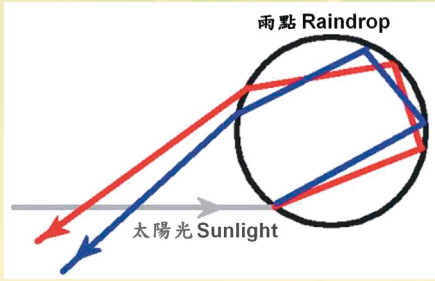
Figure 2 explains the phenomenon of the primary bow. A colour band in the rainbow that we see is formed as a result of reflection and refraction from many raindrops at different places.



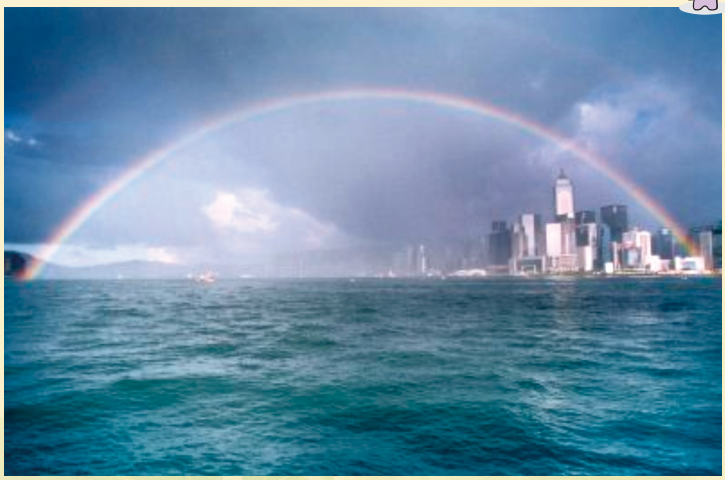

圖二
Figure 2

雨點將陽光反射兩次後，便產生副虹，顏色也倒轉了。

A secondary bow is produced when sunlight gets reflected twice inside raindrops. The colours are reversed.




圖三
Figure 3



圖四：（照片由華僑日報於1993年8月3日刊登）
Figure 4 : (Photograph courtesy of Wah Kiu Yat Po, 3 August 1993)

圖四中我們可以看見主虹外側的區域較主虹內側明顯地暗。

想知道解釋，讀者可看一看http://www.weather.gov.hk/prtver/pdf/docs/education/edu06nature/ele_rainbow_c.pdf。

電影裏亦提及魚兒並不能在鏡中辨認自己。在動物王國中（除了人類），我們知道只有一種動物有這能力（並不是家中的寵物貓與狗）。如果你想知多一點，可參看2009年12月21日的台長網誌文章。

In Figure 4, one can notice that the region outside the primary bow is much darker than inside.

The interested reader may like to see the explanation in http://www.weather.gov.hk/prtver/pdf/docs/education/edu06nature/ele_rainbow_e.pdf.

The movie also mentions that fish cannot recognize itself in a mirror. In the animal kingdom, we know that only one species can do this trick - not your pet dog or cat. If you wish to know more, check the Director's blog article on 21 December 2009.

電影的導演羅啟銳先生說過，他創作該電影的一個原因是現今人們太多怨氣及「負能量」，與昔日的情況不一樣。

往日，仍有很多寮屋及臨時搭建的木屋，每有颱風信號，人們都要趕回家照顧自己居所，免受損失。在過去幾十年，香港經歷巨大變化，現在我們已經看不見這些寮屋及木屋了。

電影的名字，令我想起一幅由著名意大利畫家卡拉瓦喬（1571至1610年）所畫的「大衛提著巨人頭顱」繪畫。

這幅畫是畫家晚年的創作。畫中男孩伸手展現戰利品，樣子頗為反感。據說，在畫家逝世後不久，有人指出圖中的兩個面孔都是卡拉瓦喬本人，一個年青，另一個年長，年輕人正為日後年老體衰最終步入死亡而惆悵。

The director of the movie, Alex LAW, said one of the reasons he did the film was that, unlike the older days, people complain too much and there is too much 'negative energy' these days.

In the older days when there were a lot of wooden squatter settlements and make-shift huts, people upon the issuing of typhoon signals had to hurry home to attend to their lodgings. Over the past few decades Hong Kong has witnessed a sea change. One can see no more of these settlements and huts nowadays.

The Chinese name of the movie means 'Time Thief'. It reminds me of a painting by the famous Italian Caravaggio (1571 to 1610), “David with the head of Goliath”.

Done late in Caravaggio's life, the painting shows the boy handling his trophy at the end of his outstretched arm, somewhat with disgust. It was said soon after the painter's death that the two faces in the picture are both of Caravaggio himself, one in his youth and the other as an older man. It was



圖五（圖片來源：維基百科）
Figure 5 (Image source: Wikipedia)

作為香港人，我們毋須用悲傷蔑視的眼光回望六、七十年代。相反，那年代的生活正好孕育出香港人現有的動力和堅忍。

李本瀅
2010年4月1日

youth contemplating age and mortality.

As Hong Kong people, we do not have to look back at the 1960s and 1970s with such sadness and contempt. Instead, life in that era gives us momentum and resilience.

LEE Boon-ying
1 April 2010



# 沙塵暴（一）
# Sandstorm (1)

3月21日（星期日）較後時間開始，遠自北方的沙塵暴為香港帶來的沙與塵。在此「塵埃落定」之際，現在是時候回答市民一些對沙塵暴的科學和天文台能夠做些什麼的問題。

**什麼是沙塵暴？**

沙塵暴的特徵是強風和湍流把大量的沙與塵從地面捲起至高空，而能見度有時可以降至1,000米以下。

**沙塵到達當日，香港是怎樣天氣？**

由於北方的沙塵暴與本港距離甚遠，3月21日（星期日）較後時間沙與塵抵達香港時已失去了沙塵暴大部分或全部的特徵。沙與塵使到本港大部分地區的能見度下降至2,000至4,000米之間。

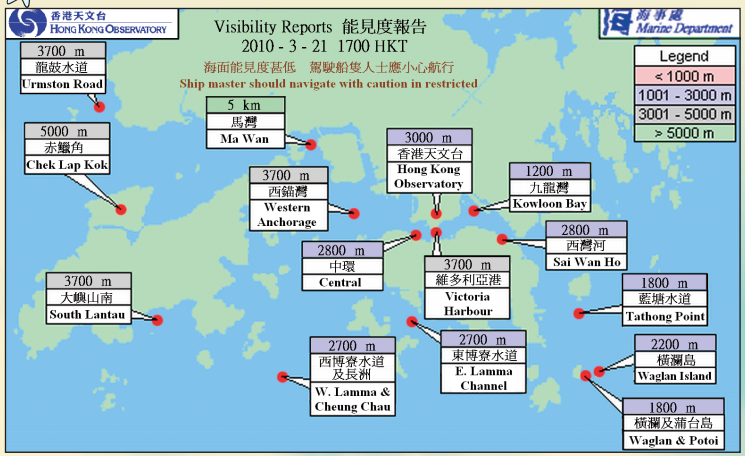
Dust and sand brought by distant sandstorms from the north affected Hong Kong starting from late Sunday (21 March). With its passage and as 'the dust settled', it is time to answer some of the questions people have on the science of sandstorms and what we at the Observatory can do.

**What is a sandstorm?**

Sandstorms are characterized by a mass of dust and sand particles lifted to great heights by a strong and turbulent wind. The visibility could sometimes be reduced to below 1,000 metres.

**What was the weather in Hong Kong the day dust and sand arrived?**

Because of the long distance, sandstorms from the north would have lost most if not all their character by the time dust and sand arrived in Hong Kong on late Sunday, 21 March. The dust and sand took the visibility down to between 2,000 and 4,000 metres over most of the territory.




圖一：2010年3月21日下午5時香港的能見度報告
Figure 1 : Visibility reports over Hong Kong at 5 p.m. on 21 March 2010

**天文台如何監測沙與塵？**

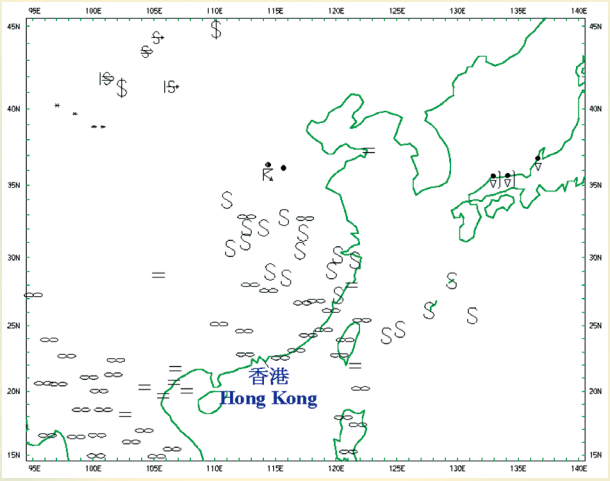
天文台有幾個工具：

一、每三小時在我們鄰近地區氣象中心，包括中國內地、韓國、日本和中國台灣的天氣報告。在2010年3月下旬的沙與塵過程中，在廣東省或福建省中部或南部（北緯27度以南）並無任何氣象站報告有關沙暴、塵暴或浮塵的現象。

**How does the Observatory monitor the dust and sand?**

There are several tools:-

1. Reports every 3 hours from weather centres in our neighbouring areas, including mainland China, Korea, Japan and Taiwan, China. During the dust and sand episode in late March 2010, no stations in Guangdong or mid/southern Fujian (south of 27 degrees N) reported any sandstorm, duststorm or widespread dust.

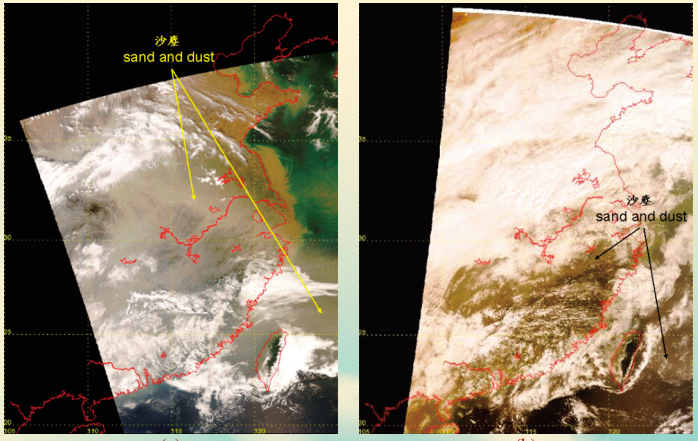



圖二：從3月21日下午5時的地面天氣報告中可以看到2010年3月下旬沙塵暴事件期間受廣泛沙塵影響的最南端範圍。在北緯40度以北，例如，蒙古有沙塵暴（符號為'Ꞩ'或'Ꞩ'）或揚沙或塵土（符號為'$'）的報告。在南方，最接近的浮塵報告（符號為'S'）在福建北部和江西北部。廣東及台灣則有煙霞（符號為'∞'）或薄霧（符號為'='）的報告。

Figure 2 : The southernmost extent of widespread dust during the sandstorm episode in late March 2010 can be seen in this surface weather reports at 5 p.m., 21 March 2010. Duststorms (symbol 'Ꞩ' or 'Ꞩ') or dust or sand raised by wind (symbol '$') were reported north of 40 degrees N, e.g. in Mongolia. Down south, the nearest reports of widespread dust (symbol 'S') were over northern Fujian and northern Jianxi. Guangdong and Taiwan reported haze (symbol '∞') or mist (symbol '=').

二、每日一兩次從低飛人造衛星拍攝的圖片。這些人造衛星在接近地球上空飛行（離地球數百公里至數千公里），有經驗的氣象人員可以用肉眼分辨出沙與塵。但是，上空如出現雲層便會掩蓋沙塵現象，情況正如3月22日（星期一）一樣。

2. Satellite pictures from low-flying satellites, available once or twice a day. Such satellites fly close to the Earth (from a few hundred kilometres to thousands of kilometres above Earth) and enable dust and sand to be discerned by the experienced eye. However, any overlying clouds would obscure the dust and sand. This was what happened on 22 March (Monday).



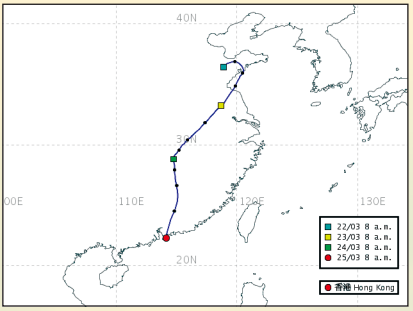

(a) (b)

圖三(a)：地球觀測衛星在3月21日下午1時06分的真彩圖像。沙與塵已經擴散到華中及華東。
(b)：3月22日上午10時38分的圖像顯示，沙與塵進一步擴散至台灣及其鄰近海域。華南普遍被雲層覆蓋，看不見任何的沙與塵現象。

Figure 3(a) : True colour image from Earth Observing Satellite at 1:06 p.m., 21 March. Dust and sand had spread to central and eastern China.
(b) : The image at 10:38 a.m., 22 March showed the dust and sand and dust further spreading to Taiwan and its adjacent waters. South China was generally covered by clouds, obscuring any dust or sand.

三、氣團反軌跡路線。天文台自2008年以來在其網站開始提供這項服務。反軌跡路線有助公眾理解氣團到達香港三天前的可能源頭。從這些軌跡，我們可以用本地的能見度與氣團三天前的可能源頭作比較。根據過往的經驗作為指導，較低的能見度（不包括霧、薄霧和下雨的情

3. Backward trajectories of air mass. The service on the Observatory website is available since 2008. A backward trajectory enables one to appreciate the possible origin, 3 days ago, of the air mass arriving at Hong Kong. From these trajectories, one can relate the local visibility to the possible origin of the air mass 3 days ago. If past experience is any guide, relatively low visibility (excluding fog, mist and rain) is normally associated with air masses coming from the north and some coming




圖四：於3月25日（星期四）上午8時抵達香港之氣團過去72小時的路線圖
Figure 4 : Past 72-hour backward trajectory of air mass reaching Hong Kong at 8 a.m., 25 March (Thursday)

況）通常是與來自北面和一些來自東面的氣團有關。而來自南面的氣團則源於海洋，通常會是天朗氣清能見度良好。然而，反軌跡路線這個工具在監測沙塵天氣方面亦有所限制。這是由於沙和塵在物理特性上與空氣不同，其移動軌跡亦可能與空氣有所分別，因此反軌跡路線僅能提供一個定性（而非定量）的評估。

**如何才能預測沙與塵？我們可否每次當台灣或香港附近的內陸氣象站，有沙與塵或沙塵暴**

from the east. Those coming from the south, being of maritime nature, normally bring good visibility and blue skies. However, there are limitations to the application of this tool to monitor dust and sand. This is because the tool offers at best a qualitative (i.e. not quantitative) assessment, for dust and sand are different from air in terms of their physical characteristics and may not necessarily follow the same trajectory as that for air.

**How can dust and sand be forecast ? Can we forecast dust and sand for Hong Kong, say, everytime dust, sand or sandstorm is reported in Taiwan, or in mainland stations close to Hong Kong?**

Prediction of dust and sand for Hong Kong is difficult at the moment because

**報告時便可預測本港將受到沙與塵的影響呢？**

現時，在香港預測沙與塵是有困難的。這是因為作出這樣的預測是需要實時（或接近實時）的沙塵濃度資料，不單是香港量度到的數據，也需要包括華南及台灣的鄰近地區量度到的數據。沒有這些實況資料，便不能準確預測沙與塵是否會到達香港。一般沒有實況資料情況下，採用電腦模式去模擬未來一兩天沙與塵的情況作用亦不大。要作出預警，鄰近地區（亦包括本港的數據）實時塵粒濃度的數據是不可或缺的。否則，難免出現虛報情況。

**當受到另一個沙與塵過程影響時，天文台會採取什麼措施？**

在受到北方遠處沙塵暴帶來的沙與塵影響之前，天文台早已預測3月21和22日的低能見度情況。但是，公眾很難判斷這些低見度情況是和沙與塵有

real-time (or near real-time) measurements of dust and sand concentration are needed, not only those taken in Hong Kong but also those taken in neighbouring areas including south China and Taiwan. It would not be possible to accurately predict the arrival of dust and sand without such 'ground truth'. Computer modelling of sand and dust a couple of days ahead may not be helpful because it generally suffers from the lack of ground truth. If advance alert or forewarning is to be given, real-time dust concentration data from neighbouring areas (in addition to local data) are needed. Without this, people have to accept quite a bit of false alarms.

**What the Observatory can/will do when another dust and sand incident occurs?**

The Observatory was able to forecast low visibilities for 21 and 22 March, the days worst affected by dust and sand from distant sandstorms in the north. But the public has difficulties relating that forecast to the dust and sand. If there is a repeat of the 21 March episode, the Observatory will enhance its information service for the public. Upon confirmation of dust and sand either by the Observatory observer or through real-time measurements of dust and

關。如果3月21日或類似情況再次出現，天文台將會加強發放信息給公眾。天文台在經過天氣觀察員証實或收到實時量度到的沙與塵數據後，便會在天氣報告中發放有關信息，讓市民留意。換言之，市民將會於事後知道情況。如果有鄰近地區實時塵粒濃度數據，我們會配合環境保護署在可能情況下發出預警。

**未來的方向怎樣？**

天文台多年來一直提供氣象資料給環保署，包括本港地面和高空氣象站的資料，及天文台區域天氣模式的每日兩次數值天氣預報產品。在低能見度或高污染的日子，我們作出氣象評估並與環保署討論有關情況。天文台已作出準備，在有需要時向環保署提供更多氣象資料及數值天氣預報方面的協助。

李本瀅

2010年4月16日

sand available to us, we can bring people's attention to it by mentioning it in the weather bulletin. In other words, the public will be informed 'after the fact'. If real-time dust concentration data from neighbouring areas are available, some forewarning may be possible through coordination with the Environmental Protection Department (EPD).

**What is the way forward ?**

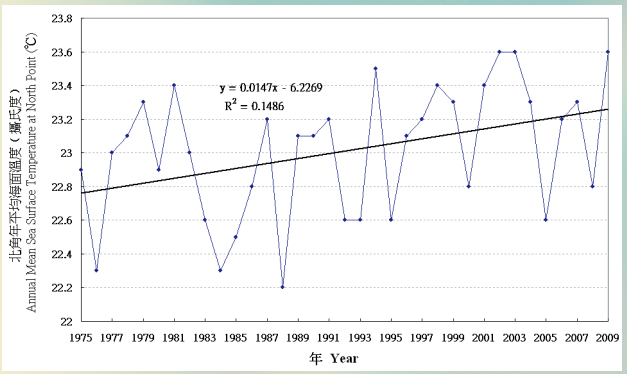
Hitherto, the Observatory has been providing EPD with weather data from local surface and upper-air stations, and twice-daily numerical weather prediction (NWP) products obtained with the Observatory's regional weather model. We also make meteorological assessment and engage in consultation with EPD during low-visibility or high-pollution days. The Observatory stands ready to assist EPD with more weather information and NWP products as and when required.

LEE Boon-ying

16 April 2010

# 氣候變化—海洋也暖起來了

# Climate change - Now the sea has also warmed up

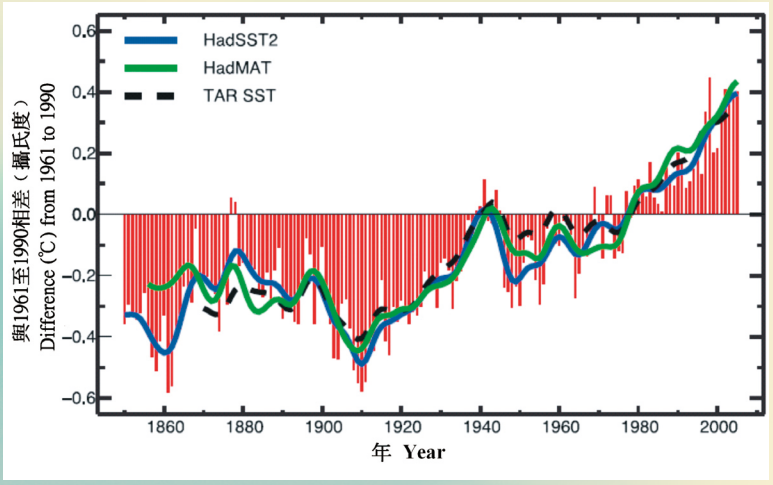



圖一：自1975至2009年北角的年平均海面溫度。線性顯著值在5%水平。

Figure 1 : Annual mean sea surface temperature at North Point from 1975 to 2009. The linear fit is statistically significant at 5%.

在消防處同事的協助下，天文台在北角量度海面溫度已超過30年。最近，同事替我計算海面溫度的趨勢，驚訝地發現海面溫度自1970年代以來上升了0.5℃。

With the help of colleagues from the Fire Services Department, the Observatory has been measuring the sea surface temperature at North Point for over 30 years. Recently I asked my colleagues to look at its trend and was amazed to find that it has risen by 0.5°C since the 1970s.




圖二：自1850年至2005年全球海面溫度的年距平（相對1961至1990年平均）。
（數據來源：政府間氣候變化專門委員會第四次評估報告書2007）
Figure 2 : Annual anomalies (relative to the 1961 to 1990 mean) of global sea surface temperature from 1850 to 2005
(Data Source : Fourth Assessment Report, Intergovernmental Panel on Climate Change, 2007)

這個結果與全球的趨勢一致，請參閱圖二。

你可能覺得0.5℃沒有甚麼大不了。但是，鮮為人知的是，海水是極難加熱的。為了比較不同物質加熱所需能量，科學家使用比熱這物理量來表示。比熱是指將一克物質的溫度提升1°C時所需要的熱力或熱能。比熱越高的物質意味著愈難升溫。下列是一些常見物料的比熱：

The result agrees well with the global trend, given in figure 2.

0.5°C may not sound much to you. But not many people know that sea water is among one of the hardest to heat up. To compare how difficult (or easy) to heat things up, scientists use a measure called specific heat, which is the heat, or thermal energy, required to raise the temperature of, say, a gram of a substance by 1°C. A substance having a high specific heat means that it is difficult to heat up. Below is a list of specific heats of common materials:



| 物料 Material | 比熱 Specific Heat ($Jg^{-1}K^{-1}$) |
|---|---|
| 鐵 Iron | 0.45 |
| 鋁 Aluminum | 0.90 |
| 乙醇 Ethanol | 2.4 |
| 混凝土 Concrete | 0.88 |
| 沙 Sand | 0.84 |
| 木 Wood | 1.7 |
| 海水 Sea Water | 3.9 |

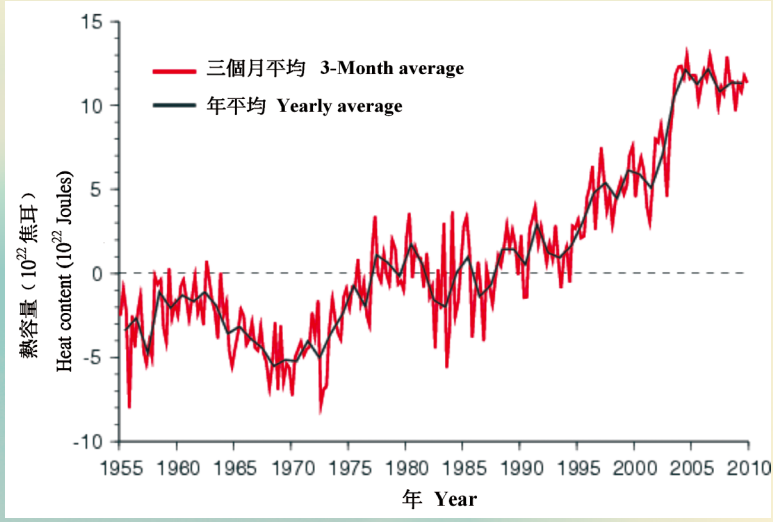
在上表中，所用的單位是焦耳／（每一克 x 每一開度）（本文中開度可視作與常用的攝氏度（℃）一樣）。因此，將一克的海水提升 1 ℃大約需要4焦耳的能量。可以看到，海水的比熱遠遠大於其他物料。

隨著大氣中人為溫室氣體的增加，整個地球正在積累熱量。這些「額外熱能」被陸地、空氣、冰或雪和海洋所吸收。 由於水有頗高的比熱，海洋是一個儲存著龐大能量的巨型儲藏庫。

Here, the unit is Joule per gram per degree Kelvin (same as degree Celsius ($^{o}$C) for the present purpose). Thus, a gram of sea water needs about 4 Joule of energy to warm up by 1$^{o}$C. As you can see from the above list, sea water's specific heat exceeds others' by a wide margin.

With the increase in the human-made greenhouse gases in the atmosphere, the entire Earth is accumulating heat. The 'extra heat' has been taken up by the land, air, ice/snow, and the ocean. Because of its high specific heat, ocean water is a tremendous reservoir storing up a huge amount of energy.

That the sea water warms up is not restricted to the surface. Take a look at



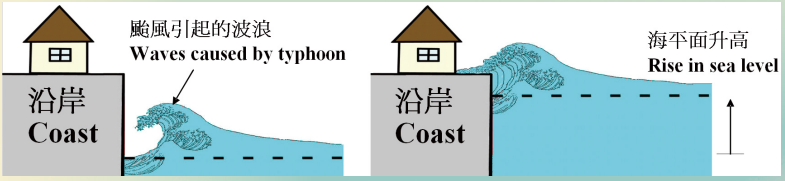

圖三：全球海洋頂部0至700米層面熱容量[註]時間序列。
（數據來源：美國國家海洋和大氣管理局國家海洋數據中心，參照Levitus等（2009）
http://www.nodc.noaa.gov/OC5/3M_HEAT_CONTENT/）
Figure 3 : Time series of global ocean heat content[note] for the 0-700 m layer.
(Data Source : NOAA National Oceanographic Data Centre, after Levitus et al. (2009)
ttp://www.nodc.noaa.gov/OC5/3M_HEAT_CONTENT/)

大家可知道海水暖化並不局限於表面。 看一看在海洋頂部700米暖化的圖三。

海洋暖化的一個直接後果是海平面高度上升。科學家估計，從1993至2003年，海水遇熱膨脹使到海水上升約18毫米（即大約每年1.6毫米）。在一個高溫室氣體排放的情景下（即人類活動照常、生活方式及能源使用量不變），海平面

Figure 3, which plots the warming in the upper 700 metres of ocean water.

A direct consequence of ocean warming is the associated rise in the sea level. Scientists estimated that thermal expansion of sea water accounts for a rise of about 18 mm from 1993 to 2003 (i.e. about 1.6 mm per year) and is expected to produce a further rise of over 0.4 m by the end of this century under a high greenhouse gas emission scenario (i.e. business as usual, no change whatsoever in lifestyle and use of energy).




圖四：在熱帶氣旋影響下，沿岸地區較容易受到水浸影響。
Figure 4 : Flooding of coastal areas becomes worse under tropical cyclone situations.

高度會變本加厲在本世紀末之前進一步上升超過0.4米。

我曾於2009年11月2日的網誌中指出，由於海平面上升，颱風所帶來的風暴潮會加劇。

最近我的同事進行了一些計算，結果顯示，如果香港的海平面上升0.4米，過去五十年一遇的風暴潮將會變為五年一遇。統計學上，這即是說，平均五十年才出現一次的3.5米高風暴潮，將變成平均五年便會出現一次。類似的風暴潮記憶猶新。在2008年，颱風黑格比帶來的風暴潮達到3.53米，引致

In the blog of 2 November 2009, I said that with a raised sea, the storm surge brought by typhoons would be more severe.

Recently my colleagues carried out some calculations, which indicate that a rise of 0.4 m in the sea level in Hong Kong would turn a 50-year storm surge into a 5-year event. That is, statistically, instead of once every 50 years on average, a 3.5 m storm surge will occur more often --- once every 5 years. We don't have to go very far back for such a storm surge. As recent as 2008, Typhoon Hagupit brought a 3.53 m storm surge, resulting in severe flooding in low-lying areas in Hong Kong. The picture of a reporter standing in chest-high water at Tai O is still vivid in many people's mind.

香港低窪地區嚴重水浸。很多人仍對一位記者在大澳水深及胸的情景留有深刻印象。

上述的數字告訴我們，在氣候變化的影響下，單是海水受熱膨脹已足以引起災難。

李本瀅

2010年4月30日

The above numbers tell us that under climate change, simple thermal expansion of sea water is enough to wreak havoc.

LEE Boon-ying

30 April 2010

註：海洋熱容量是指在地球海洋裏貯存的熱量，單位為焦耳。

Note : Ocean heat content refers to the amount of heat stored in the Earth's oceans, the unit is in Joule.

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# 氣溫究竟會上升多少？



# How hot would it get?

在2010年3月23日世界氣象日的記者會中，我回答傳媒提問時談及到天文台正在根據最新的數據更新香港極端氣溫的推算。我想多談談這一件事。

在2007年，天文台進行了一項研究，推算香港到本世紀末時氣溫的上升趨勢。這項研究利用了聯合國政府間氣候變化專門委員會（IPCC）第四次評估報告（AR4）中所採用的各個全球氣候模式的月平均氣溫數據。這項研究亦嘗試推算未來極端高溫或低溫天氣出現頻率的變化。

在作出2007年的研究後，天文台得到第四次評估報告中各個全球氣候模式的每日氣溫數據。因此，天文台使用這些更精細的數據來作進一步的計算。由於每日氣溫數據的時間分辨率較月平均氣溫數據高，給

In answering a media question on 23 March 2010, the World Meteorological Day, I mentioned that the Observatory was updating the extreme temperature projections for Hong Kong based on the latest data. I would like to further elaborate on this.

In 2007, the Observatory conducted a study to assess the temperature trend for Hong Kong up to the end of this century. The study utilized the monthly temperature figures simulated by the global climate models participating in the Fourth Assessment Report (AR4) of the United Nations Intergovernmental Panel on Climate Change (IPCC). The study also made an attempt to estimate how frequent extremely hot or cold weather would become.

Since the 2007 study, more refined AR4 model simulation data, in the form of daily temperature figures, have become available to the Observatory. Thus the Observatory recently undertook further evaluation using such data. The much higher temporal resolution of the data,

我們一個更詳細分析的機會。

最新的計算顯示，本港將會有更多的酷熱（最高氣溫是33℃或以上）天氣，而寒冷天氣事件將會顯著減少，與2007年作出的研究結果相似。然而，計算結果亦顯示，香港在本世紀末時，每年平均寒冷日數（日最低溫度是12℃或以下）將會少於一日，即是說寒冷天氣將近乎絕跡，這對很多人來說意味著「冬天」不再出現，而時間上比2007年作出的研究結果為遲。

我想指出，無論新或舊的結果均一致地指出21世紀的氣候將會顯著較暖，升溫的幅度將取決於未來溫室氣體排放的情景。最近的計算結果並明確顯示出香港在近數十年來變暖正在加劇的事實。

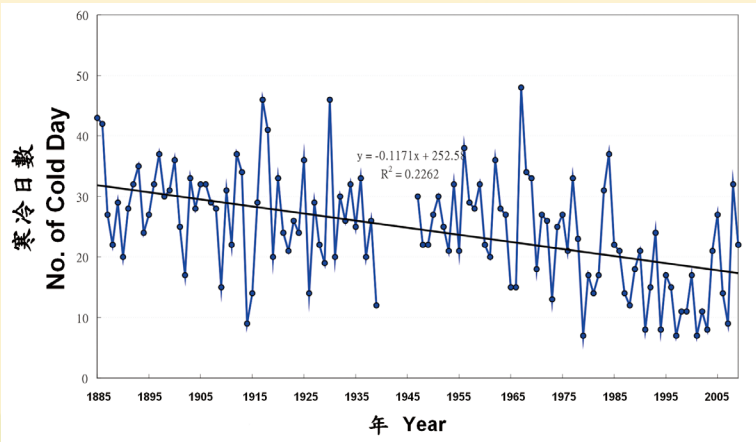
圖一顯示香港自19世紀有記錄以來寒冷日數的趨勢。假設寒冷日數隨著時間作線性變化，從延伸直線的簡單方法看到，

i.e. daily instead of monthly, allowed us to carry out further analyses to refine our projections.

The latest evaluation results suggest that, similar to the results of the 2007 study, there will be more very hot (maximum temperature at or higher than 33°C) while cold weather events will decrease significantly. However, they also suggest that cold days (minimum temperature at or less than 12°C) in Hong Kong may practically disappear towards the end of the century, i.e. less than 1 cold day per year. Such disappearance of cold days, which many people perceive as 'winter', is expected to occur later than that estimated in the 2007 study.

I would like to point out that both the old and new results have consistently depicted a significantly warmer climate in the 21th century with a range of temperature rises depending on the future greenhouse gas emission scenarios. The recent evaluation does not obscure that fact that warming in Hong Kong has been accelerating in recent decades.

Figure 1 shows the trend of the number of cold days since records began in the 19th century in Hong Kong. Assuming




圖一：香港每年的寒冷日數（1885至2009年）。一個寒冷日子表示該天氣溫下降至12℃或以下。圖中採用了線性擬合，顯著值在 5% 的水平。

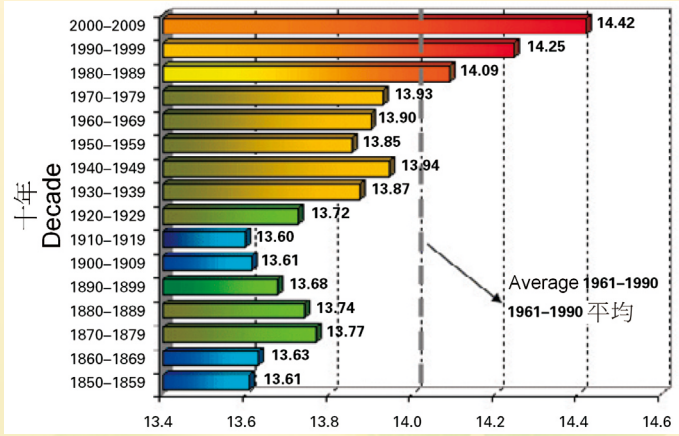
Figure 1 : Annual number of cold days in Hong Kong (1885 to 2009). A cold day is one where the temperature fell to 12°C or below. The linear fit is statistically significant at 5% level.

寒冷日子將會在下世紀初完全消失。這種粗略的估計跟以上討論的最新的計算相差不遠。

政府間氣候變化專門委員會已在第四次評估報告明確指出，全球變暖是無可置疑的，並且極可能是人為造成的。最近，根據世界氣象組織報導，2009年是全球自1850年有紀錄以來第五個最暖的年份。在十年的尺度上，2000至2009這十年比1990至1999的十年較暖，而這又比更早的1980至1989十年更暖。2009年是香港自19世

a straight line for the change in the number of cold days with time, simple extension of the line into the future tells us that cold days would completely disappear by early next century. Such a crude estimate is not far off from the results of the recent evaluation discussed above.

IPCC has unambiguously pointed out in AR4 that global warming is unequivocal and very likely human induced. Recently, the World Meteorological Organization (WMO) reported that, globally, the year 2009 is the 5th warmest on record since 1850. On the decadal scale, the decade of 2000 to 2009 was warmer than the decade of 1990 to 1999, which in turn was warmer




圖二：年代際全球平均氣溫（℃）
（數據來源：WMO Statement on the Status of the Global Climate 2009
http://www.wmo.int/pages/publications/showcase/index_en.html）
Figure 2 : Decadal global average temperature (°C)
(Data Source : WMO Statement on the Status of the Global Climate 2009
http://www.wmo.int/pages/publications/showcase/index_en.html )

紀後期有記錄以來第九最溫暖的年份。雖然很多香港人可能會覺得，剛過去的冬季很像十多年前的「典型」冬天，但事實上，2009年12月至2010年2月三個月的平均溫度仍比正常高於0.6℃。

氣候變化的科學研究是不會停頓和不停改進，每有新的數據，我們會於適當時間報告最新研究結果。

李本瀅

2010年5月14日

than the pervious decade of 1980 to 1989 and earlier ones. Locally in Hong Kong, 2009 is also the 9th warmest year since records began in the late 19th century. While many Hong Kong people might feel that the past cool season was very like a 'typical' winter decades ago, the fact remains that the average temperature of the 3-month period from December 2009 to February 2010 was still 0.6°C higher than normal.

Scientific study on climate change is an on-going process that is constantly improving. We will provide further updates from time to time in the light of new data.

LEE Boon-ying

14 May 2010

# 沙塵暴（二）
# Sandstorms (2)

歷史上沙塵暴的報道不少。以下是勞倫斯（1888至1935年，即廣為人知的「阿拉伯的勞倫斯」）的精彩描述：

*「當沙塵暴臨近，熱風灼着我們的面部，令人透不過氣來。忽然間風向改變，瞬間從我們背後吹來，空氣變得凄冷和潮濕。同時，風勢轉烈，太陽也受我們頭上的一團厚厚黃沙遮蓋而消失…」*

*「…這些內旋風，吹去了緊握在手的外衣，風沙撲面，令我們張不開眼睛，失去了方向感… 而狂風亦吹起大量泥土，把大棵的矮樹，一束束的雜草，甚至小樹也被連根拔起，在大風中亂舞，並吹向我們，或在我們頭頂掠過，令人驚心動魄。雖然，我們還能看到四周的情況，有七、八呎的距離，但是放眼遠望是頗為危險的。*

There is no lack of accounts of sandstorm in history. Here is a wonderful description by T.E. Lawrence (1888 to 1935, widely known as 'Lawrence of Arabia') :

*"When it got near, the wind, which had been scorching our faces with its hot breathlessness, changed suddenly; and, after waiting a moment, blew bitter cold and damp upon our backs. It also increased greatly in violence, and at the same time the sun disappeared, blotted out by thick rags of yellow air over our heads... "*

*"... these internal whirling winds tore our tightly-held cloaks from our hands, filled our eyes, and robbed us of all sense of direction ..... while large bushes, tufts of grass, and even a small tree were torn up by the roots in dense waves of soil about them, and driven against us, or blown over our heads with dangerous force. We never were blinded - it was always possible to see for seven or eight feet to each side - but it was risky to look out, as, in addition to the certain sand-blast, we never knew if we should not meet a flying tree, a rush of*



勞倫斯，1917年（圖片來源：維基百科）
T.E. Lawrence, 1917 (Image source : Wikipedia)

*因為除了風沙肆虐，我們還擔心被空中吹來的樹木、碎石，或充滿亂草的灰塵擊中。這場風暴持續了18分鐘，…」*

以下是Hassanein Bey（1889至1946年，Bey是土耳其語，意指酋長）同樣有力的描述：

*「好像是有熱汽管道埋藏在地面一樣，蒸汽從數千百個小洞口吐出。沙石一陣陣噴出來，隨風飛舞旋轉，並憑着風力增大而慢慢上升，整個沙漠像受到地底一些無形的力量而抬升。大粒的碎石擊中了皮膚、*

*pebbles, or a spout of grass-laden dust. This storm lasted for 18 minutes, ... "*

Here is an equally powerful account by Hassanein Bey (1889 to 1946, 'bey' is a Turkish term for 'lord') :

*"It is as though the surface were underlaid with steam-pipes, with thousands of orifices through which tiny jets of steam are puffing out. The sand leaps in little spurts and whirls. Inch by inch the disturbance rises as the wind increases its force. It seems as though the whole surface of the desert were rising in obedience to some upthrusting force underneath. Large pebbles strike against the skins, the knees, the thighs. The sand-grains climb the body till it strikes the face and goes over the head. The sky is shut*

膝蓋及大腿。沙粒則沿着身體向上爬，直至擊到面龐和越過頭頂。天空都被遮蔽，除眼前的物體外，其他所有都變得朦朧，宇宙像是被沙石填滿一樣。」

中國歷史上沙塵暴的記載一般較簡略，但它們的破壞力毫不遜色：「二月武威（甘肅）大風，黃霧下塵，摧樹木，倒房屋，傷亡人畜甚多」。（公元351年）

法顯（公元337至422年）是東晉時期著名的佛教僧侶，在他前往印度的旅途中有以下的描述：「沙河（新疆）中有惡鬼熱風，遇則皆死，無一全者」。

二百年後，唐朝最著名的僧侶玄奘（公元602至664年），步法顯後塵往西域取經。他有這樣的描述：「暴風奮發，飛沙雨石，遇者喪沒，難以全身」。

沙塵暴形成所需的條件一out, all but the nearest objects fade from view, the universe is filled."

Historical accounts of sandstorms by Chinese were generally brief, but no less violent in terms of their destruction : *"There was high wind in Wuwei (Gansu) in February, with dust descending from a yellow fog. Trees were uprooted, houses torn down, and many people and animals killed."* (351 CE)

In his journey to India, Fa Xian (337 to 422 CE), a well-known Chinese Buddhist monk, wrote: *"There was a ghostly hot wind in Sha He (Xinjiang), killing everybody it touched and ripping them to pieces."*

Following his footstep 200 years later, Xuanzang (602 to 664 CE), the best known monk in the Tang period, reported: *"The stormy wind developed suddenly, blew sand and rained down stones, killing everybody that encountered it and smashing them to pieces."*

Conditions required for the formation of sandstorms are, in general :

1. a source(s) of sand;
2. unstable atmosphere, to take the sand to great heights (e.g. intense solar heating);
3. high wind, to give the storm momentum.

般為：

一、沙塵源頭；

二、不穩定的大氣，使到沙塵可以升至高空（例如遇到強烈的日照而受熱上升）；

三、大風，為沙塵暴勢帶來動力。

中國沙塵暴的記錄在公元前3世紀至20世紀期間一直都在增加，尤其是13世紀後為甚。相信這是由於人口膨脹，以及人們不斷遷徙，無可避免地出現更多火耕土種、放牧、森林濫伐。在新開墾地上灌溉，意味著河流或水道的水源減少，造成下游農田失耕，農地也開始逐漸整體向東部和南部萎縮。戰爭及氣候變化使到情況進一步惡化，導致植被減少，土地漠化。由於風蝕的影響，棄耕的土地一旦裸露，很難恢復為自然草原。因此，土地漠化進一步加劇。而歷久不斷有胡人從北面入侵，變本加厲令

In China, sandstorm reports have generally been on the increase after the 13th century during the period 3rd century BC to 20th century. This is believed to be a result of population expansion as well as movement of people to the frontiers from time to time, which inevitably led to increased cultivation, grazing and deforestation. Irrigation of newly cultivated land practically meant that water supplies were reduced further down the river or waterway, resulting in degradation of farmland downstream. This started the gradual process of retreat of farmland as a whole to the east and south. The situation was aggravated by warfare and climate change, both leading to land desertion. Deserted land, once barren, would not easily revert to natural grassland because of the effect of wind erosion. As a result, desertification intensified. Incessant invasion of horsemen from the north in earlier years did not help, in fact exacerbating the vicious circle of vegetation retreating further towards the east and south.

Climate change in the 20th century works further havoc. Beijing's annual rainfall in the 1990s had fallen to 600 mm

漠化進一步向東和向南擴展，做成惡性循環。

20 世紀出現的氣候變化帶來進一步困擾。北京每年的降雨量從50年代接近800毫米下降至90年代的600毫米，然而氣溫卻一直上升。在沒有灌溉情況下，雨量減少及氣溫上升的共同影響，令土壤中的水分耗損，削弱其抗風蝕的能力。直到20世紀中期，大規模的植樹造林和土地管理才開始。

看來，人們仍然要面對環境各種的挑戰及解決問題，情況才得好轉。

李本瀅

2010年5月28日

from nearly 800 mm in the 1950s, while temperature has been on the increase. The combined effect of decreasing rainfall and increasing temperature means that without irrigation, the moisture in soil would be gradually lost, and this weakens its resistance to wind erosion. It was not until the mid-20th century that large-scale reforestation and land management began.

It appears that people still have to confront the various challenges until the situation improves.

LEE Boon-ying

28 May 2010

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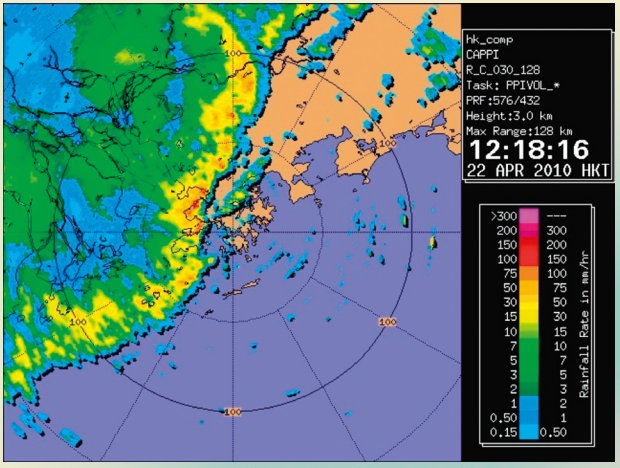
# 怪風？
# Freak wind?




圖一：2005年5月9日嘉道理農場暨植物園一棵直徑超過80厘米的樹被狂風連根拔起。
（鳴謝嘉道理農場暨植物園提供協助拍攝）
Figure 1 : An over 80 cm diameter tree in the Kadoorie Farm and Botanic Garden toppled during the squally thunderstorms of 9 May 2005.
(Photo taken with the assistance of Kadoorie Farm and Botanic Garden)

4月22日陣風以每小時100公里的速度吹襲香港，機場三個行李箱被吹起撞擊及損毀一架正在停泊客機的機身。此外，本港其它地區亦有兩人分別被倒塌的牆壁及翻側的巴士站擊中受輕傷。究竟，這些陣風是否我們現時經常聽到的所謂「怪風」？

Gusts of 100 km per hour hit Hong Kong on 22 April, damaging a passenger plane on ground at the airport when three luggage containers slammed into the plane's body. There were also a couple of minor casualties brought by a collapsed wall and a toppled bus stop elsewhere in the territory. But was it really 'freak wind', which we often heard now and then?



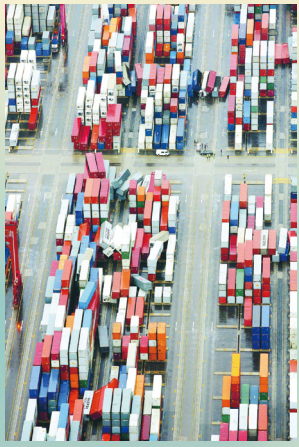

圖二：2010年4月22日下午12時18分的雷達圖像。當時一條颮線正在橫過香港西部地區。
Figure 2 : Radar picture of 12:18 p.m. on 22 April 2010. A squall line was crossing the western part of Hong Kong at that time.

其實，這些在華南被稱為「石湖風」的現象，通常來自西北方（因此世界其它地區稱之為「西北風」）。雖然無法追查它的起源，人們常用這個名字來描述與颮線相連的陣風。颮線是沿着一條線迅速移動的雷暴群。

「石湖風」往往伴隨著大雨和雷暴，風向會突然轉變，風速瞬間增強。大雨時高空較涼空氣下沉到地面，會帶來較低的氣溫，氣溫下降幾度的情況亦是常見。颮線有時更帶來冰雹和龍捲風。

The wind is actually called 'Shi Hu Feng' in south China and comes from the northwest quadrant (hence the name 'northwesterlies' in other parts of the world). While its origin cannot be traced, the name is commoners' description of the gusts associated with a squall line. A squall line is a cluster of thunderstorms moving in rather rapidly along a line.

'Shi Hu Feng' is often accompanied by downpour and thunder, as well as sudden changes in the wind direction coupled with abrupt high winds. The downpour brings lower temperatures, as the cooler air aloft descends to the ground. A fall of several degrees Celsius is quite common. Occasionally a squall line may even bring hail and tornadoes.



圖三：2005年5月9日受到「石湖風」影響，青衣九號貨櫃碼頭有數十個貨櫃被突襲的狂風吹塌（照片由明報提供）

Figure 3 : Tens of containers blown off by squalls at the No. 9 Container Terminal in Tsing Yi during the squally thunderstorms of 9 May 2005. (Photograph courtesy of Ming Pao)

在過去五年，香港共遇到8個引致嚴重破壞的「石湖風」的例子（見表一）。

大部分人命傷亡及財產損失是可以避免的。有關操作員應該將貨櫃、棚架及其它鬆散的物體鞏固地繃緊。圖三告訴我們，倒塌及被吹倒的貨櫃相信大部分是空的，因為它們較輕。當日的新聞標題正正說出要點：「沒有天災、只有人禍。」

李本瀅，呂永康

2010年6月11日

Over the past five years, Hong Kong encountered a total of 8 cases of 'Shi Hu Feng' which brought us significant damage ( see Table 1 ).

Most of the loss of lives and damage to property is avoidable. People need only to tighten the containers, scaffoldings and other loose objects securely. In the picture above, it is believed that most if not all of the containers that got blown off and collapsed were empty, because they were lighter. The news heading said it all: "No natural catastrophe, only human disaster."

LEE Boon-ying, LUI Wing-hong

11 June 2010

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表一：自2005年至2010年4月在香港引致嚴重傷亡的「石湖風」報告

| 日期 | 天氣概況 | 香港受到的破壞 |
|---|---|---|
| 2005 年 5 月9 日約中午 | 與一道低壓槽相關的強烈雷暴橫過香港，為本港帶來大雨及高達每小時135公里的狂風。 | 新界西部部分疊起的貨櫃被吹倒，導致一人死亡，兩人受傷。本港亦有超過100宗樹木及棚架倒塌報告，倒塌事件更導致九龍交通陷於停頓。 |
| 2006年6月9日下午9至10時 | 一條颮線在珠江口形成並橫過香港，為本港帶來大雨及高達每小時101公里的狂風。 | 在鴨脷洲約有20棵樹被吹倒。 |
| 2007年4月17日下午8至9時 | 當晚一條颮線橫過香港，為本港帶來大驟雨及高達每小時100公里的強烈陣風。 | 港島一個招牌被吹塌，引致三人受傷。 |
| 2007年5月18日下午5至7時 | 當日黃昏一條颮線從西北向東南橫過香港，為本港帶來大驟雨及超過每小時100公里的強烈陣風。 | 新界西北部有超過20個貨櫃箱被吹塌，引致4人受傷。 |
| 2007年6月10日上午2至4時 | 清早一條颮線自西北向東南移動，橫過香港，帶來大驟雨及每小時超過120公里的強烈陣風。 | 多處地方約100棵樹被吹倒。 |
| 2008年7月27日下午3至5時 | 廣東內陸的強烈雷暴向南移動，為香港帶來冰雹及高達每小時131公里的狂風。 | 新界東部對開海面有一名潛水人員在強烈陣風及大浪中遇溺。新界西北部一個疊高至五層的貨櫃被陣風吹倒，一名吊臂操作員受傷。 |
| 2009年3月5日約下午2時 | 一道冷鋒移向華南沿岸，為本港帶來大雨及幾陣狂風雷暴。 | 強風在新界西北部吹翻一個貨櫃。 |
| 2010年4月22日中午至下午1時 | 一道冷鋒橫過華南沿岸，為本港帶來狂風雷暴及高達每小時100公里的陣風。 | 三個行李櫃被吹倒，擊中及損毀一架正在停泊的飛機。新界分別有兩人被倒塌的牆壁及一個翻側的巴士站所傷。 |

Table 1 : Reports of 'Shi Hu Feng' which have brought significant damage to Hong Kong from 2005 to April 2010

| Date | Weather situation | Damage in Hong Kong |
|---|---|---|
| 9 May 2005, around noon | Intense thunderstorms associated with a trough moving across the territory brought heavy rain and squalls reaching 135 km/h. | Collapse of some stacked containers in container terminals, causing one death and two other injured in western part of the New Territories. Also, over 100 reports of fallen trees and scaffoldings, some of which brought traffic to a standstill in Kowloon. |
| 9 June 2006, 9 to 10 p.m. | A squall line developed over the Pearl River Estuary and swept across Hong Kong, bringing heavy rain and squalls of up to 101 km/h. | About 20 trees were blown down on Ap Lei Chau. |
| 17 April 2007, 8 to 9 p.m. | A squall line swept across Hong Kong that night, bringing heavy showers and severe gusts of up to 100 km/h. | Three persons injured when a sign board collapsed on Hong Kong island. |
| 18 May 2007, 5 to 7 p.m. | A squall line swept across Hong Kong from northwest to southeast that evening, bringing heavy showers and severe gusts of over 100 km/h to the territory. | Four persons injured when more than 20 stacked containers collapsed in northwestern part of the New Territories. |
| 10 June 2007, 2 to 4 a.m. | A squall line swept across Hong Kong from northwest to southeast in the early morning, bringing heavy showers and severe gusts of over 120 km/h. | There were about 100 reports of fallen trees throughout the territory. |
| 27 July 2008, 3 to 5 p.m. | Severe thunderstorms over inland Guangdong moved south and brought hail and squalls up to 131 km/h to the territory. | A diver drowned and another injured off eastern part of the New Territories amid strong gusts and waves. A crane operator injured when wind gust tossed a shipping container off a five to storey stack in northwestern part of the New Territories. |
| 5 March 2009, Around 2 p.m. | A cold front moving towards the south China coast brought heavy rain and a few squally thunderstorms to the territory. | Strong winds blew over a cargo container in northwestern part of the New Territories. |
| 22 April 2010, noon to 1 p.m. | A cold front moving across the south China coast brought squally thunderstorms and gusts of up to 100 km/h to the territory. | A parked passenger plane damaged when three luggage containers were blown off the ground and hit the plane. Two persons injured by a collapsed wall and a toppled bus stop respectively in the New Territories. |

# 中國的人口和氣候變化

# China's population and climate change

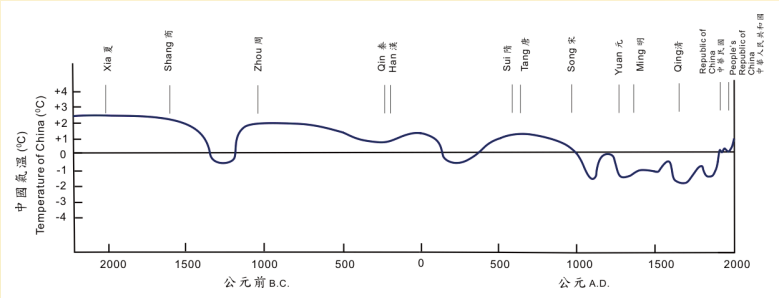
早前一則新聞報導，中華民族在氣候溫暖時興盛，但在氣候寒冷時衰落。具體來說，有三個較長時間的溫暖期，大致上分別為商朝（公元前1600至1046年），東周（公元前770至256年）及唐朝（公元618至907年）。

圖一是根據著名中國氣象學家竺可楨（公元1890至1974年）的研究繪出。中國悠長歷史中，大部分時間都沒有儀器的記錄，直至19世紀中期開始才有氣溫測量。不過，中國官誌記錄可追溯至超過三千年前，包括每年第一次霜降或下雪、河水冰結和融化、植物發芽和樹木開花、以及候鳥出現和離開的日期。氣候學家可以根據這些現象評估氣候隨着不同時間的變化。

There was a news article some time ago saying that Chinese civilization flourished when the climate was warm and plummeted when the climate was cooler. Specifically, there were three extended periods of warm weather roughly coinciding with, respectively, the Shang (1600 to 1046 BC), Eastern Zhou (770 to 256 BC) and Tang period (618 to 907 CE).

Figure 1 was based on the work of the famous Chinese meteorologist, Zhu Kezhen (1890 to 1974). There was no instrument record for most of the long history of China. In fact, measurement did not start until mid-19th century. However, official Chinese accounts dating back to over 3,000 years contain detailed records such as the first frost or snow, river freezing and melting, budding and flowering of plants and trees, as well as arrival and departure of migratory birds in the year. This allows an assessment of the climate and its variations over time.

The above evidence suggests that compared with today, it was a lot warmer




圖一：中國歷史上的氣溫趨勢

Figure 1 : Temperature trend in the history of China

上述的證據表明，歷史上不同時期的氣候曾經比現在更溫暖及濕潤。舉例說，學者根據周朝早期一些中文字，如服裝、器皿、書籍、家具及樂器等名稱均以「竹」字為頭，推斷竹子被廣泛用於黃河流域。亦有記錄人們在公元前110年黃河氾濫時使用竹子編筐盛石子來堵截洪水的事。公元前109至91年間司馬遷編寫《史記》一書，記載了竹子是中國西北陝西地方的一個經濟出產。現時這些地方竹樹已不復見了。

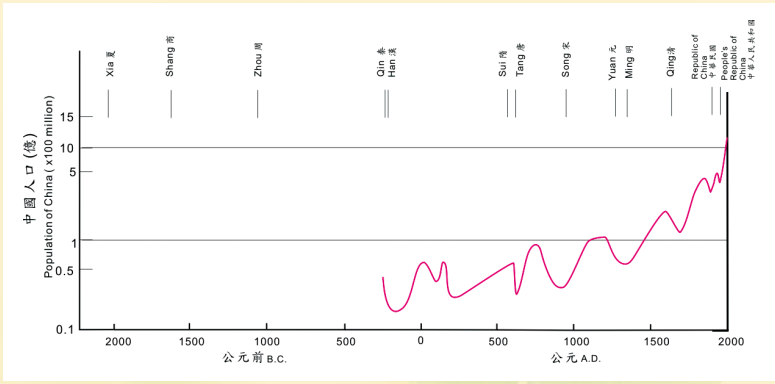
and more humid at different times in history. For instance, the make-up of some Chinese characters (such as clothing, utensils, books, furniture and musical instruments) used in the early Zhou period enabled scholars to deduce that bamboos were widespread in the Yellow River basin at the time. There was also an account of people using bamboo crates filled with stones to combat floods when the Yellow River overflew its banks in 110 BC. The "Records of the Grand Historian", written during 109 to 91 BC, mentioned bamboos as an economic staple in the northwest province of Shaanxi. Nowadays bamboos are no longer seen in these places.

《史記》還記載一些亞熱帶植物的生產情況，例如四川的橘子及山東的桑樹，對這些物種來說這兩個地方現今實在比較偏北。在商周時代，山東人利用燕子到來的日期定春分，而1970年代家燕要到3月下旬才到長江下游。此外，還有記載在公元前一千多年期間人們普遍用梅子來調和飲食，因當時不知有醋。早期的一首詩「終南何有？有條有梅。」告訴我們現今西安附近生長有梅樹，而現在那裡都見不到這些樹了。

從前較溫暖及濕潤的氣候大致上有利於農業和人口的增長，而當時人口主要集中在黃河和長江之間附近一帶。圖二勾劃中國在過去二千年的估計人口。歷史上曾進行了數次全國人口普查或家戶調查，最早始於在商朝期間（公元前16至11世紀）。現存最早全國家戶

The "Records" also described the production of such sub-tropical plants as mandarin orange in Sichuan and mulberry in Shandong, both places being quite north for these species nowadays. During the Shang-Zhou period, the arrival time of swallows was used by people in Shandong to determine the Spring Equinox. By the 1970s, it was not until late March before they arrived at the lower reaches of the Yangtze. There were also accounts of plums being widely used in food during the 1,000 years BC, as vinegar was still unknown for most part of this period. An early poem cited growth of the fruit near present-day Xian, which no longer exists these days.

The warmer and more humid climate back then in general favoured agriculture and population growth, as people concentrated mostly between and around the Yellow River and Yangtze River. Figure 2 depicts estimations of the Chinese population over the past 2,000 years. Several national censuses or household surveys had been conducted in history, the earliest occurring in the Shang period (16th to 11th century BC). The earliest existing records of national household survey dated




圖二：中國在過去二千多年的估計人口

Figure 2 : China's population (estimated) over the past 2,000 years



調查的記錄可追溯至公元前2年西漢時期。除了1950年代以後，圖中所有的數字均為粗略估算，亦有可能是低估的，因為當時人口普查主要目的是賦稅。

從圖二可以看出，儘管人口普遍上升，中國人口歷來均有大幅變化，有不少情況人口更是減半。這些情況往往發生在戰亂、飢荒和瘟疫時期。有時飢荒和疾病伴隨戰爭而來，而其他時間乾旱或洪水導致失收，令生計急劇惡化而起亂。

back to 2 BC in the Han period. Except for those after the 1950s, all the numbers depicted were at best rough figures and probably underestimates, as the emphasis then was on people who had to pay tax.

From figure 2, it can be seen that even though it is generally on the rise, China's population can change quite wildly. It was not unusual to see population being reduced by half. This often happened during periods of warfare, famine and diseases. Some of the time warfare preceded famine and diseases, but vice-versa at some other times when there might be uprisings because of rapidly deteriorating livelihood arising from drought or extensive floods.

在過去兩千多年的時間，人口逐漸往南擴展，從兩河流域伸延至華南。其中一個顯而易見的原因是北方不斷有胡人入侵（因此自秦朝時期建造長城，以及後來不同的時間朝代均進行了修葺和鞏固工程）。另一個原因是在過去一千年氣候普遍變較為寒冷（圖一），有利於人民向南遷移，尋求更適合居住的氣候環境。如今，單是華南一個廣東省，人口已經超過一億，比較中國在公元1500年之前任何時間總人口還要多。誠然，跟世界其它地區一樣，如果沒有行政、科技和醫療等社會進步，人口增長是不可能的。

氣候變化，特別是在過去30年的變化令情況進一步複雜。除了旱澇增加、熱浪頻仍、風暴加劇及海平面繼續上升外，有需要指出近年冰川的加速溶化，包括喜馬拉雅

The past 2,000 years or so also saw gradual spreading of the population to the south, from the two rivers' region towards south China. One obvious reason is the incessant invasion of horsemen from the north (hence the construction of the Great Wall since the Qin period and its repair and reinforcement at different times in subsequent dynasties). Another reason is that it has become generally cooler over the past 1,000 years (Figure 1), which favoured southward migration as people sought more habitable climate. Nowadays, the population in the south China province of Guangdong alone already tops 100 million, a figure that exceeds China's total population at any time before 1500 AD. Like other parts of the world, the population increase would not have been possible without advances in such societal aspects as administration, technology and medical care.

Climate change especially in the past 30 years adds further complications. Apart from increased drought and floods, heat waves, severe storms and continuous rise in the sea level, it is necessary to point out the accelerating retreat of glaciers in recent years (see the blog of 24 February




圖三：戰國時期（公元前475至221年）所佔地理範圍

Figure 3 : Map of China showing the area occupied by the states during the Warring States Period (475 to 221 BC)

山（請看2010年2月24日的網誌）。有研究指出，喜馬拉雅山的冰川為中國、南亞和東南亞地區超過五千萬人口提供淡水。冰川減退對水資源的影響，已經引起亞洲不少國家的關注。

另一個複雜問題是多處地方氣溫普遍上升。雖然這個現象可能帶來短期的利益（例如農業增產），但是太大的升溫

2010), including those in the Himalayas. It has been said that the Himalayan glaciers supply freshwater to at least 50 million people in China, south Asia and southeast Asia. The impact of the Himalayan glacier retreat on water resources has already raised concerns in a number of countries in Asia.

Another complication is the general temperature increase in many places. While this may bring short-term benefits (e.g. more crops in a year), too much of a rise may not be good thing. Temperature

未必會帶來好處。氣溫上升，加上部份地區雨量減少或水源變為枯竭，在缺乏灌溉的情況下會導致土壤水分流失。如要維持目前的農業產能，結果是加劇對水源的需求，令情況更劣。

因此，從人口角度看，對中國氣候變暖說法孰是孰非，但似乎弊多於利，有需要積極地規劃適應及減輕氣候變化的影響。

李本瀅
2010年6月25日

rise, coupled with reduced rainfall or water supply in some areas, would result in loss of soil moisture in the absence of irrigation. This exacerbates the demand for water if the aim is to maintain the present level of agriculture.

Viewed from the population angle, therefore, there are pros and cons to a warmer climate in China, with probably more disadvantages than advantages. Active planning for adaptation and mitigation of the effects of climate change may be necessary.

LEE Boon-ying
25 June 2010

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# 貝加爾湖
# Lake Baikal




圖一：貝加爾湖位置圖
Figure 1 : Map showing location of Lake Baikal

貝加爾湖位於現今蒙古以北不遠處的西伯利亞，是世界上第二大淡水湖，僅次於裏海。湖的生物富多樣性，有大量的植物和動物，其中大部分品種是該區獨有的。以前，許多俄羅斯人尊稱它為「貝加爾海」。

Located in Siberia just north of present-day Mongolia, Lake Baikal is the second most voluminous freshwater lake in the world, after the Caspian Sea. Its biodiversity features a large number of species of plants and animals, most of which are unique to the area. In the past, many Russians respectfully referred to it as the ' Baikal Sea '.



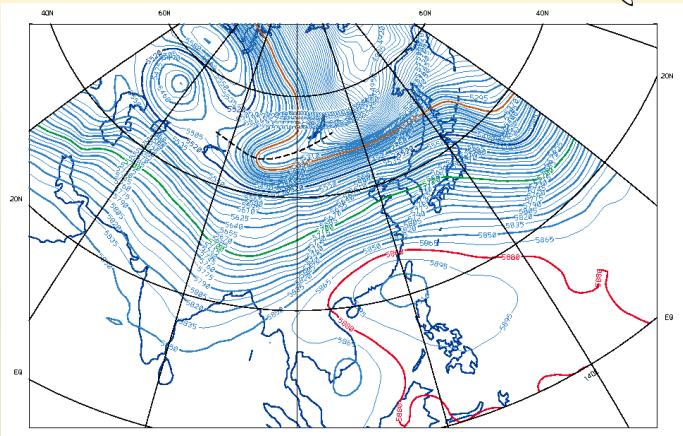
圖二：貝加爾湖西南岸的夏天（圖片來源：維基百科）
Figure 2 : Lake Baikal (southwest shore) in summer (Image source : Wikipedia Commons)

香港的預報員對貝加爾湖地理上是頗為熟悉的。在1970年代，兩位天文台同事，鐘國棟先生（當時的台長）及朱榮基先生曾指出，當大氣中層（約5,500米高）有低壓槽掠過貝加爾湖，兩天後會有一股冬季季候風寒潮抵達香港。

儘管數值天氣預報發展迅速，預報員現時仍然參考這經驗法則，以制訂冬春季期間未來數天的天氣預報。圖三顯示低壓槽經過貝加爾湖的一個例

The lake is geographically familiar to forecasters in Hong Kong. In the 1970s, two Observatory colleagues, Messrs Gordon Bell (then the Director) and Edmund Chu, noticed that the passage of a trough at mid-atmosphere (about 5,500 metres aloft) over the lake was usually followed by a surge of winter monsoon at Hong Kong two days later.

Despite the advent of numerical weather prediction, forecasters nowadays still find this 'rule of thumb' useful when formulating the weather forecast for the next few days during winter and spring time. An example of trough passage is



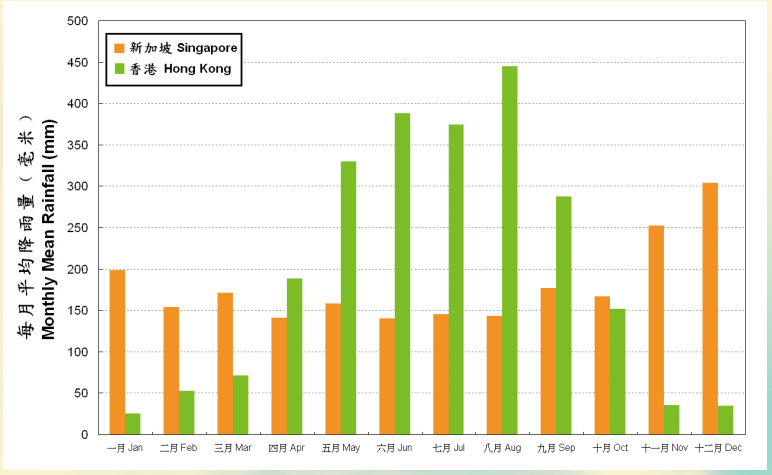

圖三：大氣中層低壓槽（虛線）經過貝加爾湖的一個例子
（圖片為歐洲中期天氣預報中心提供，2010年1月19日）
Figure 3 : An example of the passage of mid-atmosphere trough (dotted line) through Lake Baikal
(Photography courtesy of European Centre of Medium-range Forecast, 19 January 2010)

子。在該次天氣過程中，低壓槽經過貝加爾湖48小時後香港的氣溫下降了5℃。

許多人未必知道，強烈的冬季季候風可以影響較南的地區，遠至東南亞、新加坡及馬來西亞等地區。這些地區的氣候特徵是有一個濕潤的季候風季節－從11月左右到1月，而這些月份雨量甚至高於炎熱月份的雨量。在冬季或春季期間，當香港的氣壓急劇上升，那些地方或會於稍後時間爆發惡劣

given in Figure 3. On that occasion, Hong Kong experienced a fall of 5°C 48 hours after the trough passed over the lake.

Not many people here are aware that intense winter monsoon can influence the weather in southeast Asia, as far south as Singapore and Malaysia. These places are characterized by a wetter monsoon season - from around November to January, when the monthly rainfall is higher than those in the hotter months. An abrupt rise in Hong Kong's air pressure during winter or spring time may be followed by an outburst of severe weather there. A case in point was early March of 1967, when sudden




圖四：新加坡與香港的雨量對比

Figure 4 : Diagram showing how Singapore's rainfall contrasts that of Hong Kong

的天氣。一個例子是1967年3月初，當時南海的偏北風突然增強，幾天後為馬來西亞半島24小時內帶來超過300毫米的雨量。圖四是新加坡與香港的雨量對比。

遠自西伯利亞的氣流，竟可以為赤道地區帶來暴雨。誠然，天氣是沒有界限的。

李本瀅

2010年7月9日

strengthening of northerly winds over the South China Sea brought more than 300 millimetres of rain in 24 hours to the Malaysia Peninsula a few days later. Figure 4 shows how Singapore's rainfall contrasts that of Hong Kong.

Air blowing from the distant Siberia could bring heavy rain to the tropics. Truly, weather knows no boundaries.

LEE Boon-ying

9 July 2010

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# 夢江南
# Dreaming river south

早前出席了一個音樂會，是芬蘭與中國建交六十年在港的慶祝活動。音樂會曲目包括芬蘭及中國作曲家的作品。

說起芬蘭作曲家，最知名的應是西貝流士(「芬蘭頌」)。當晚演出他的《戀人組曲》，雖然曝光較少，但絕非凡品。

令人驚喜的是由王立平多年前原創、董昭民最近作曲的《憶紅樓》交響詩。在香港大提琴家李垂誼弓下，斯洛布迪尼渥指揮芬蘭Avanti！室樂團的伴奏，旋律之婉約悽美，真怪自己為甚麼沒聽過！我想這曲很快便會登上古典音樂的流行榜。

相信很多人都知道，《紅樓夢》是18世紀曹雪芹（1715？至1763？年）所作。

I went to a concert the other day, which featured music by Finnish and Chinese composers to commemorate in Hong Kong the 60th anniversary of Finland-China relations.

Of the Finnish composers, Jean Sibelius, of 'Finlandia' fame, is probably the best known. His music that evening, “The Lover Suite”, though not frequently performed here, is nothing short of a gem.

“Remember the Red Chamber”, composed by Tung Chao-ming based on original themes created by Wang Liping years ago, is a nice surprise. Its beautiful but subtle and melancholic melodies came out naturally from the cello of Trey Lee, exquisitely complemented by The Avanti! Chamber Orchestra (Finland) under the baton of Dmitri Slobodeniouk. I asked myself why I had not heard them before. Little wonder that the work would hit the top classical music list quite soon.

The book “Dream of the Red Chamber” by 18th century writer Cao Xue-qin (1715? to 1763?) is well known. The Cao family had long been servants to the Qing court and,



納蘭性德（來源：china.org.cn）
Nalan Xingde (Image source: china.org.cn)

曹家世代早年為清皇室的家奴，因漸受寵信，至曹的曾祖父時已成為了南京大族。曹的祖父曹寅，是康熙皇帝（1654至1722年）年幼時的玩伴。康熙六次下江南，其中四次是由曹家接待。

曹寅與被譽為滿清第一詞人的納蘭性德（字容若，1655至1685年）諗熟，有「*家家爭唱飲水詞，納蘭心事幾曾知？*」之句。當時納蘭《飲水詞》幾乎無人不知，無人不誦。

through trust by the royalty, became a revered one in Nanjing by the time of Cao's great grandfather. Cao's grandfather, Cao Yin, was a playmate to Emperor Kangxi (1654 to 1722) when they were young. During his reign Kangxi visited the Nanjing region six times, four of which were hosted by the Cao family.

Cao's grandfather, Cao Yin was acquainted with Nalan Xing-de (1655 to 1685), often known as the best 'ci'[1] poet in the Qing period. Cao Yin once wrote: "*Every household vies to sing the 'Drinking Water Ci', but who really knows Nalan's broodings?*"[2] Nalan's "Drinking Water Ci" collection was already widely circulated at the time.

納蘭父納蘭明珠為大學士，權傾朝野。納蘭本人22歲時殿試，嶄露頭角。深情自賞，文武兼備，與康熙同齡，在宮中升遷至一等侍衞。「納蘭」是滿語的漢譯，與「那拉」同，那拉姓氏中最著名的人物應該是慈禧太后（1835至1908年）。

納蘭夫妻十分恩愛，可惜時間不長，婚後三年妻難產而死。納蘭詞中不乏描寫愛情、思念和悼亡，都是為她而作。

納蘭喜歡結交才學之士，大半是明朝的遺少或世家子弟。他富同情心，不時對他們給予政治和經濟上的幫助。

納蘭詞隨手拈來，都是佳作。看一看他的《夢江南》：「*昏鴉盡，小立恨因誰？急雪乍翻香閣絮，輕風吹到膽瓶梅。心字已成灰。*」

據注詞人說，詞中「雪」和「絮」是有一段典故的。雪

Nalan's father, Nalan Ming-zhu, was Grand Secretary to the emperor and was very powerful in the court. Reflective and deeply passionate, Nalan himself enjoyed a literary reputation well before passing the palace examination at 22. Proficient in military skills and similar in age and closely associated with Emperor Kangxi, he was subsequently promoted to the rank of first-class bodyguard. 'Nalan' was Manchurian translated into Chinese, and was the same as 'Nara', a surname probably best associated with the family of Empress Dowager Cixi (1835 to 1908).

Nalan was deeply in love with his wife, who died in childbirth barely three years into their marriage. Many of Nalan's 'ci' poems were reminiscent of the love, longing and grief for her.

Nalan had many literary friends, most of them having served the old Ming dynasty or of revered families. He was sympathetic to them, sometimes in the form of political protection or financial assistance.

Pick any of Nalan's many 'ci' poems and it will not disappoint. Let's read his "Dreaming River South"[3]: "*Crows gone in the evening, standing alone but not sure longing for whom. Sudden snow turns up catkins on the chamber, a light breeze blows*

即雪花，絮即柳絮。話說東晉（265至420年）宰相謝安（320至385年）家中庭院賞雪，問雪花像甚麼。他的兒子答像往天上撒鹽，衆人大笑。這時侄女謝道韞曰可比作「柳絮因風起」，此句令後世人驚艷千年。後來她嫁入望族王家，這便是詩中所指的王謝：「*舊時王謝堂前燕，飛入尋常百姓家。*」（唐・劉禹錫，772至841年）

3至5世紀時，南京平均溫度估計比現時低1℃至2℃，築有冰房，儲藏冰塊以保存食物。隨著氣候變化，下雪的日子已顯著減少，現時每年只有約七天。

回說曹雪芹，年少時曹家亦已家道中落，納蘭亦已辭世（終年三十歲）。納蘭家族的傳說可能給了他許多故人往事的點滴。「*今宵便有隨風夢，知在紅樓第幾層*」，「*因聽*

*on plum blossoms in the vase. The heart-shaped incense has since turned into ash.*"

According to 'ci' poetry interpreters, there is a story to the 'snow' and 'catkins' in the poem. Snow means snowflakes, while catkins refer to those of willows. In the East Jin period (265 to 420), the prime minister Xie An (320 to 385) while watching snow in the courtyard asked what best described snowflakes. His son said it would be like throwing salt into air, and everybody laughed. At this moment, his niece, Xie Dao-yun, suggested that snowflakes were akin to willow catkins thrown up by the wind. This comparison left people mesmerized for a thousand years. She later married into the prominent Wang family. Hence the poem: "*Swallows from the halls of Wang and Xie in their heyday, now fly into the homes of ordinary people.*" (Liu Yu-xi 772-842, Tang period)

On average a couple of degrees (Celsius) lower than the present, older-day Nanjing were built with ice cellars during 3rd to 5th century to preserve food. With climate change, the number of snow days nowadays has decreased significantly to about 7 days in a year.

Now back to Cao Xue-qin. The Cao family's fortunes had reversed when Cao

*紫塞三更雨，卻憶紅樓半夜燈*」，此皆納蘭的句子。

難怪乾隆皇帝（1711至1799年）看過《紅樓夢》後，嘆問這「不就是明珠的家事麼？」

李本瀅

2010年7月23日

was very young. Nalan already passed away (aged 30). However, the legends of the Nalan family may have left their imprint on him. "*There will be dreams by the wind tonight, and who knows what floor in the Red Chamber they will be.*" "*Listening to the nocturnal rain at the frontier, takes me back to the Red Chamber lamps in the middle of night.*" All these references to dreams and the Red Chamber were Nalan's words.

Little surprise, then, when Emperor Qianglong (1711 to 1799) read the "Dream of the Red Chamber", he sighed and asked "Were these not (Nalan) Ming-zhu's family stories?"

LEE Boon-ying

23 July 2010



Footnote :

(1) 'ci' - a kind of lyric Chinese poetry, characterized by lines of irregular lengths. Typically the number of characters in each line and the arrangement of tones were determined by one of around 800 set patterns, each associated with a particular title, called 'cipai'.

(2) Please forgive my poor translation of 'ci' poems in this blog.

(3) "Dreaming River South" - a 'cipai'. 'River South' means the geographic area to the south of the lower reaches of the Yangtze River. Nanjing ranks among the most important cities in the area.


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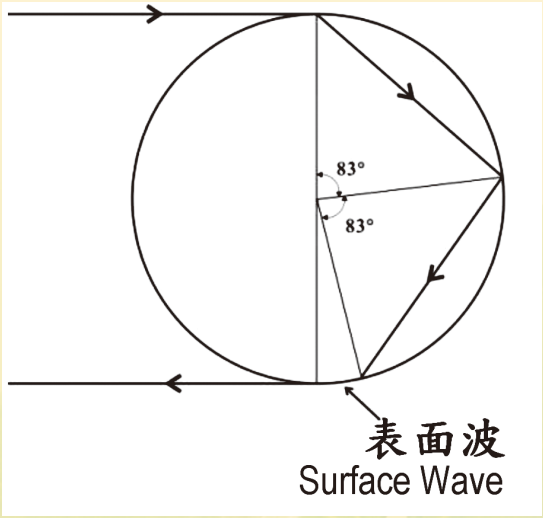
# 「佛光」
# Glory



圖一：彩光環
Figure 1 : 'Glory'

早前報載在飛機上拍攝到「佛光」，又名「彩光環」。我年前在雲南上空亦拍到的「彩光環」（圖一），可見飛機的影子投在雲上，而影子被光環圍繞，藍色光環在內，紅色光環在外。世界其他地方甚至曾觀察到主光環被三至四個更大光環圍繞的「彩光環」景象。

Earlier on there was a press report showing a photograph of a 'glory' taken from an aeroplane. I took a similar photo a few years back while flying over Yunnan (Figure 1). shows the shadow of the plane on the clouds, with concentric rings of blue on the inside and red on the outside. There have been observations elsewhere of these primary rings being accompanied by as many as three to four similar rings of larger diameter.




圖二：水滴對光線所起折射及反射作用
Figure 2 : Light refracted and reflected inside a water droplet

這些光環是光進入水滴內折射及反射後產生（雲亦是由水滴組成的）。光環直徑與水滴大小有一定關係，直徑愈小，水滴愈大。

圖二顯示光線自水滴邊沿進入，作兩次大約 83 度角反射後，再循水滴邊沿作 180 度反方向離開。

這現象不一定在飛機上才可拍攝到。有時身處高地，雲層位於腳下，而太陽在背後把你的影子投到雲上，也可能會

These rings are produced when light is refracted and reflected after entering water droplets (a cloud is made up of water droplets). The ring diameter is related to the size of the water droplets. The smaller the glory diameter, the larger the droplets that produce it.

Figure 2 shows a light ray hitting the edge of a water droplet is refracted, reflected and then refracted again, before clinging to the surface of the droplet and conveyed the rest of the way around the droplet to the backward direction (180 degrees).

A glory may also be seen from a high

看到你頭部的影子出現「彩光環」內。它獨特之處是假如有伴同行，同伴的影子並不會出現在你看到的彩光環內。這可能是「佛光」名稱的由來。

光線循直線前進，進入眼簾成像的觀察，由來有自。早於中國戰國時代，墨子談到光線成像時說：*「光之人，煦若射。下者之人也高，高者之人也下。足蔽下光，故成景於上；首蔽上光，故成景於下。」*意思是，光線射在人身上，源自發光體向四面發射。由下方射出的光成像於上，上方則反在下。用頭或腳分別掩蔽光源，效果相同。

這光線概念沒有在國內進一步發展，原因不明。歷史上，要到數個世紀後，出生於現今伊拉克南部城市巴士拉的大科學家阿耳・哈曾（965至1039年），首先用實驗証明成像原因。他指出是光射在物體

point, for example on a mountain, when there are clouds down below and the sun is behind you, projecting your shadow onto the cloud. You may be rewarded by the sight of a shadow of your head surrounded by coloured haloes. What is unique about the shadow, moreover, is that if someone else is with you, his/her shadow does not have such haloes. This is probably how the name 'glory' came about in the first place.

The observation of light travelling in a straight and forming an image after entering the eyes dates back a long time. During China's Warring states period, the philosopher Mozi had this to say about light forming an image : *"Light falling on a person comes from a source radiating in all directions. Light from beneath forms a tall shadow; light from above gives a short shadow. Blocking the light with the foot produces an image at the top; blocking with the head gives an image down below."*

We do not know why this concept of light was not further developed in China. A few centuries later, the great scientist Alhazen (Abu 'Al1 al-Hasan ibn al-Hasan ibn al-Haytham, 965 to 1039), born in Basra of present-day Iraq, was the first to prove by experiments the formation of images. He pointed out that an image of an object is formed by light reflected from the

後反射，反射光進入我們的眼睛後，在腦中形成影像。

除光學以外，阿耳・哈曾涉獵極廣，著作等身。其真知灼見，影響後世超過五百年。他的《光學論》一書，大大影響早期科學方法，提出對光學及視覺科學的革新創見，其重要性與牛頓（1643至1727年）的《數學原理》並列。

下次出外，不妨多留意大自然四周，說不定會看到更多有趣的現象。

李本瀅

2010年8月6日

object and subsequently entering the eyes, and argued that vision occurs in the brain, rather than the eyes.

Apart from optics, Alhazen was involved in the study of many science subjects and published a large number of works. His insights had far-reaching effects on the development of science for more than five centuries. His "Book of Optics" has been ranked alongside Isaac Newton's (1643 to 1727) "Philosophiae Naturalis Principia Mathematica" as one of the most influential books in physics for introducing an early scientific method, and for initiating a revolution in optics and visual perception.

Next time you go outdoor, be on the lookout for what is around you. God knows you may be able to discover an interesting phenomenon or two.

LEE Boon-ying

6 August 2010


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# 流動的盛宴
# A Moveable Feast

作家村上春樹（1949年–）透過書中《挪威的森林》一個人物說，讀過費滋傑羅（1896至1940年）的《大亨小傳》三遍的人，可以和他做朋友。他說翻開《大亨小傳》任何一頁開始讀，都會有所得着，不會令人失望。

《大亨小傳》於1925年面世。費滋傑羅的名氣緊貼1920爵士年代氛圍。他到過歐洲幾次，特別是巴黎及法國里維埃拉，與當時巴黎的美國人社區稔熟，其中著名的包括海明威（1899至1962年，1954年諾貝爾文學獎）。

海明威與費滋傑羅的友情，可以說是既愛且恨，記錄在他的《流動的盛宴》內，富幽默之餘，也帶一點科學。

故事是這樣的。由於天氣惡劣，費滋傑羅和妻子不得不把他們那部沒有頂蓋的小汽車

In his “Norwegian Forest”, Haruki Murakami (1949 - ) through one of the characters in the book says that people who has read Scott Fitzgerald's (1896 to 1940) “The Great Gatsby” three times could be his friend. He also says that turn to any page of “The Great Gatsby” and start reading, and you will not be disappointed because there is always something in it.

“The Great Gatsby” was published in 1925. Fitzgerald's fame was closely associated with the ‘Jazz Age’ in the 1920s. He made several excursions to Europe, notably Paris and the French Riviera, and became friends with many in the American expatriate community in Paris, notably Ernest Hemingway (1899 to 1962, Nobel prize in literature 1954).

Hemingway's friendship with Fitzgerald was one of 'admiration and hostility'. He described it in “A Moveable Feast”, with no lack of humour and a touch of science.



費滋傑羅，1937年
Scott Fitzgerald, 1937
(Image source: Library of Congress, Prints & Photographs Division (http://www.loc.gov/rr/print/), Carl Van Vechten Collection (http://lcweb2.loc.gov/pp/vanhtml/vanavt.html), reproduction number LC-USZ62-88103 DLC (b&w film copy neg.)

丟在里昂。費滋傑羅問海明威是否願意陪他一同到里昂取回汽車，並將車子駛回巴黎。於是他們一起出發，但取回車子後回程時又遇上大雨，需在旅館留宿。

費滋傑羅感到有點不舒服，變得有脾氣，着海明威弄一支體溫計來。海明威於是找茶房協助，但時間已經太晚，藥房都關門了。等了很久，茶房卒之拿來了一支溫度計。

海明威問：「難道你只能弄到這樣一支嗎？」

The story is like this. Fitzgerald and his wife had to leave their car, which was without a top, in Lyon because of bad weather. Fitzgerald asked if Hemingway would go down with him to pick up the car and drive up with him to Paris. So there they went and picked up the car, but on the way back, there was again heavy rain and they became held up in a hotel.

Fitzgerald somehow felt unwell, became quite irritable and asked for a thermometer. Hemingway accordingly sent for one, but it was late and the pharmacy was closed. After a long time, the waiter came back and brought a

回答是「全旅館就只有這麼一支」。那是一支量浴缸洗澡水的溫度計，安在一塊木板上，配上足夠使溫度計沉入水的金屬底座。

海明威接過溫度計，將它甩下去，對費滋傑羅說：「你運氣真好，這不是一支肛門計。」

費滋傑羅問：「這一種該往那兒放？」

「擱在腋下。」

於是海明威將溫度計在他腋窩裏放了四分鐘。

費滋傑羅說：「我以為人家是只放一分鐘的。」

海明威解釋說：「這是支大溫度計，你得乘上這溫度計大小的平方。」

李本瀅

2010年8月19日

thermometer.

"Is this the only one you could get?" Hemingway asked.

"It is the only one in the hotel" was the response. It was a bath thermometer with a wooden back and enough metal to sink it in the water.

Hemingway took it, shook it down, and said to Fitzgerald, "You're lucky it's not a rectal thermometer."

"Where does this kind go?" Fitzgerald asked.

"Under the arm."

So the thermometer was kept under the armpit. It lasted four minutes.

"I thought they only kept them in for one minute," Fitzgerald said.

"This is a big thermometer," Hemingway explained. "You multiply by the square of the size of the thermometer."

LEE Boon-ying

19 August 2010

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# 捕手
# The Catcher

名著《麥田捕手》的作者塞林格（1919至2010年），於年初逝世。

上一網誌（2010年8月20日）提及海明威和費滋傑羅兩位美國名作家之間的友情。塞林格於二次世界大戰時服役，在登陸諾曼第及進攻德國期間曾遇見海明威。他感受到海明威的友善和謙虛，跟後者對外的陽剛形象大相逕庭。相比下，他對費滋傑羅大為佩服。透過《麥田捕手》書中主角荷頓．卡爾菲之口，他對費氏的《大亨小傳》簡直如痴如醉。

《麥田捕手》描述少年人的反叛及疏離，一針見血，至今仍能道出少年的心聲。書內少年主人翁荷頓，自命立於懸崖邊緣，看守着上千的小孩子在麥田上嬉戲。「我要做的，

The author J.D. Salinger (1919 to 2010), who wrote “The Catcher in the Rye” in the 1940s, passed away recently.

The previous blog (dated 20 Aug 2010) covered the friendship between Hemingway and Fitzgerald, two very well-known American authors. It happened that Salinger met Hemingway during the World War II campaign from Normandy into Germany. While Salinger was impressed with Hemingway's friendliness and modesty, which contrasted with his masculine image in the public, it was Fitzgerald that he deeply admired. In the words of the main character in “The Catcher”, Holden Caulfield, he was ‘crazy about’ Fitzgerald's “The Great Gatsby”.

Depicting youth alienation and rebellion, “The Catcher” has been praised as the authentic voice of every teenager even to this day. In the book, Holden the teenager pictured himself ‘on the edge of some crazy cliff’, watching thousands of kids playing in a field of rye. "What I



塞林格與姐姐，1920年
（圖片來源：維基百科）
Salinger with his elder sister Doris, 1920
(Image source: Wikipedia)

就是當他們正要掉進懸崖時，出手相救」，故有麥田捕手之名。對他來說，掉進懸崖意味長大成人，告別童真、爽趣及寬容。

書中最感人的一幕是故事的尾聲。荷頓就讀近紐約的名校，因成績低劣被逐，又深感得不到老師及朋友的支持，憤然決定離家往西部闖。他的十歲妹妹菲比聽到後，執拾了

have to do, I have to catch everybody if they start to go over the cliff." That is, to be a catcher in the rye. To him, falling off the cliff would mean entering adulthood and losing innocence, spontaneity and generosity.

The book is at its most moving towards the end. Expelled from an elite school near New York City for poor grades and finding little consolation from teachers and friends, Holden decided to move out west. He told his 10-year old sister Phoebe

細軟打算和他一道去。他不同意，令妹妹大為不快，拒絕與他談話。她還跑到對街，隔着馬路跟他走向中央公園動物園。

抵達動物園，她停下來觀賞海獅。荷頓賞試伸出雙手言歸於好，她却不發一言，蹲身避開。兩人繼續隔着行人路，走過了熊館。

離開動物園，穿過很窄的地道時，他們彼此稍為接近。荷頓想把弄她大衣後的腰帶。她終於開口：「如你不介意，請勿踫我！」仍然色厲內荏，但語氣總算稍為緩和。

行近旋轉木馬圈時，他倆開始聽到耳熟能詳，兒時已播放的歌曲。菲比坐上她喜愛的木馬，對他說「我不再怒您了」，然後吻他。就在那時，天開始下雨。她取出他早前送她的紅色獵帽，幫他戴上。

他問：「您不要嗎？」

his plan. She brought along a suitcase with her clothes in and wanted to go with him. He refused, and she was upset and wouldn't talk to him. She then ran across the street and started walking on the other side of the street as he headed towards the Central Park Zoo.

She followed him into the zoo, and stopped to watch the sea lions. Holden put his hands on her shoulders. Without a word she bent her knees and slid out from him. She continued to walk on one side of the sidewalk while he walked on the other as they passed the bears.

They then left the zoo and went through a small tunnel. They were closer to each other now and Holden took hold of the belt at the back of her coat. "Keep your hands to yourself, if you don't mind," she broke the silence, still sore at him, but not as much as before.

As they got closer to the carrousel in the park they started to hear the music – the same old song that had been played since they were tiny kids. There she rode her favourite horse, said to him. "I'm not mad at you any more", and gave him a



「你就戴一會兒吧。」

至此，他變了臨崖待救，她成了捕手。荷頓回心轉意，重投父母懷抱。

李本澄

2010年9月3日

kiss. Then it started to rain. She drew out the red hunting hat he gave her earlier on, and put it on his head.

"Don't you want it?" he asked.

"You can wear it a while."

With this, Phoebe became the catcher and he the fallen. He decided to go home.

LEE Boon-ying

3 September 2010

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# 人非孤島
# No man is an island



上月香港遊客在馬尼拉流血事件，全城悲慟，令人感到生命的無常。

英國詩人暨神學家約翰·鄧恩於1623年重病復原期間，寫下了《沉思語》，其中第十七則有以下詞句：

*「人非孤島，無人可遺世獨立。每人都是一塊陸地，是大陸的一部分。如果海浪將一塊泥土沖走，歐洲就缺了一小塊；如果把一個海岬，抑或是你或朋友的農莊沖走，亦是如此。任何人的死都令我萎縮，因為我和全人類唇齒相依。因此，不必叫人去問鐘為誰而鳴；鐘為你而鳴。」*

鄧恩提及島嶼和大陸，可能是暗喻當時英格蘭與歐陸之間的威脅和機遇。

17世紀是地理探險和全球貿易的時代。新大陸的發現以

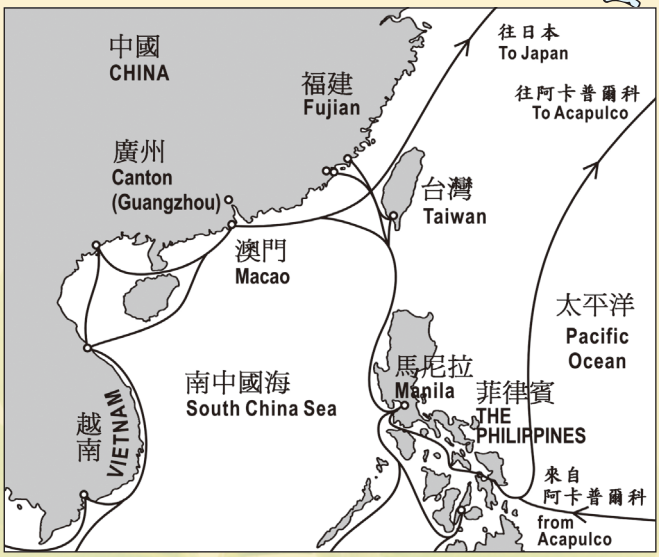
The carnage involving Hong Kong tourists in Manila last month reminds us once again how fragile life can be.

In 1623, the English poet and preacher, John Donne, wrote his “Meditation” while recovering from a serious illness. The seventeenth prose contains the following:

*"No man is an island, entire of itself; every man is a piece of the continent, a part of the main. If a clod be washed away by the sea, Europe is the less, as well as if a promontory were, as well as if a manor of thy friend's or of thine own were: any man's death diminishes me, because I am involved in mankind, and therefore never send to know for whom the bell tolls; it tolls for thee."*

Donne referred to 'island' and 'continent', probably alluding to the threats and opportunities that existed between England and Europe at the time.

The 17th century was the age of geographic exploration and global trade. Exploration of continents and confrontation with indigenous communities started in the




17世紀南中國海貿易路線
Marine trade routes in South China Sea, 17th Century

及與土著的衝突，始於1492年哥倫布抵達美洲。翌年教皇敕令，當時西班牙及葡萄牙兩個海權，瓜分未來新土地的發掘，西班牙西盼大西洋，葡萄牙則東望印度洋。於是，葡萄牙人麥哲倫於1521年到達菲律賓（以菲臘二世命名），納入西班牙土地，而澳門則於1557年變成葡萄牙租借地。

至於全球貿易，印度商人早於15世紀或以前已利用海路

15th century after Christopher Columbus' discovery of the New World in 1492. The next year the Pope decreed that any further exploration be split between Spain and Portugal, the two sea powers at the time. While Spain was to head west in the direction of the Atlantic, Portugal would head east towards the Indian Ocean. This led to the arrival of the Portuguese explorer Ferdinand Magellan in the Philippines (name derived from King Philip II of Spain) in 1521 and claimed the islands for Spain, and to Macao becoming a Portuguese enclave in 1557.

進口中國瓷器。15世紀來迪迦瑪開闢繞經非洲的海路後，葡萄牙人開始將大量瓷器、絲織品等運進歐洲。（至16世紀時，荷蘭人取而代之。）

1625年2月，西班牙耶穌會士拉斯科特斯乘搭吉亞聖母號，自馬尼拉前赴澳門。這些旅程通常都是牽涉大量白銀，以交換中國絲織品，並運回馬尼拉轉手牟利，將所得用於支援當地的宗教活動。船上混集各式人等，包括葡萄牙人、荷蘭人、日本人、印度人、猶太人、摩爾人及非洲人。旅途中，他們遇上了大風，航道偏離，結果在中國海岸近福建擱淺。被俘後，拉斯科特斯口渴，表示想喝水。看守給了他一碗熱水，但他並不習慣喝熱水。往後的手勢更於事無補，他們拿煙給他抽，但身為耶穌會士是不准抽煙的。最後，他們端來了一杯不冷不熱的水，「用名叫茶的草葉煮成的」。

Regarding global trade, merchants in the India subcontinent began to import by sea porcelain from China in the 15th century or earlier. After Vasco de Gama's discovery of the sea route round the African corner to India in the late 15th century, Portuguese mariners started to bring vast amounts of porcelain, silk and other goods to Europe. (This was overtaken by the Netherlands by the turn of the 16th century.)

In February 1625, a Spanish Jesuit, Adriano de las Cortes, boarded the ship "Nossa Senhora da Guia" from Manila to Macao. Journeys like this normally involved the exchange of silver for silk made in China, the resulting profit being used to support religious activities in Manila. Passengers on board the ship were truly international: Portuguese, Dutch, Japanese, Indians, Jews, Moors, and Africans. Because of a wind storm, the ship was stranded in the China coast near Fujian. While being incarcerated, las Cortes asked for some water. He was given a bowl of hot water which he was not used to. Subsequent hand signs obviously did not help, for he was offered tobacco which Jesuits should not take. Eventually he

這可能是歐洲人首次接觸茶葉的記錄之一，到19世紀時，茶已成為歐洲社會文化的一部分。

從以上我們知道，17世紀初期，中國特別是沿海地方已盛行抽煙。煙草為茄屬植物，包括蕃茄、馬鈴薯及辣椒，原生於南美洲。它們由西班牙船隻經阿卡普彌科（墨西哥城西南一個重要海港）運往遠東。

貿易令大量白銀進入中國的趨勢，至19世紀初開始逆轉，英屬東印度公司將大批鴉片運往中國，導致後來1837至1842年間及以後的武裝衝突，結果是香港島、九龍半島及新界逐步割讓。之前馬尼拉及澳門是與南中國貿易的樞紐，而香港則從此登上國際地圖。

國際社會從美洲吸收許多新事物，但我們沒有從美洲土著身上學到他們的道義。在那裏，武裝衝突目的是調整部族間的資源及生態邊界，並非要

was given 'warm water made with a herb called tea'. This was probably one of the first European contacts with the herb. Tea became very popular in the West starting from the 19th century.

The above tells us that by the early 17th century tobacco smokes were already part of Chinese life, at least along the coastal areas. Tobacco belongs to the tomato family, which includes: tomato, potato and pepper, all of which are native to South America. These were brought to the Far East by Spanish ships arriving at Manila from Acapulco, a major seaport southwest of Mexico City.

The influx of silver into China was reversed in the early 19th century when the British East India Company brought shiploads of opium to China. This led to the military confrontations which started in 1837 to 1842, resulting in the successive ceding of Hong Kong Island, Kowloon and the New Territories. Whereas Hong Kong came to the fore at this time, Manila and Macao were very much the trading hubs for goods to and from south China.

While the rest of the world picked up various new things from the Americas, what was perhaps not learnt from the

全數殲滅。俘虜尤其是弱者可以認輸而自行離去或偷走，真正的戰士留下來接受折磨和死亡，面對勇氣的終極考驗。但直至上世紀和本世紀，現代社會仍可見到大規模屠殺、種族滅絕、人為饑荒和恐怖暴力，受害者往往是老百姓，讓無辜生靈塗炭。我們應該向過去學習。

人非獨島，所有人都是大陸的一部分。如果海浪將一塊泥土沖走，大陸就缺了一塊，世界就失去一塊。任何死亡都令我們萎縮。

李本澄

2010年9月10日

American Indians is their morals and ethics. There and then the aim of confrontation was to ensure balance of ecological borders and resources, not extermination. While prisoners especially the weak were allowed to admit defeat and leave or escape, only the bravest could volunteer to stay and face torture and death. But this century and last we still see holocausts, genocide, deliberate starvation and terrorism, and these afflict mostly innocent civilians. There is something we can learn from our past.

No man is an island. Every person is a piece of the continent. If a clod be washed away by the sea, the continent is the less. The world is the less. Any death diminishes us.

LEE Boon-ying

10 September 2010

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1. "Vermeer's Hat", Timothy Brooks, Chinese translation, 2010.
2. Wikipedia

# 「豬腰」與「沙灘球」

## Kidney and beach ball

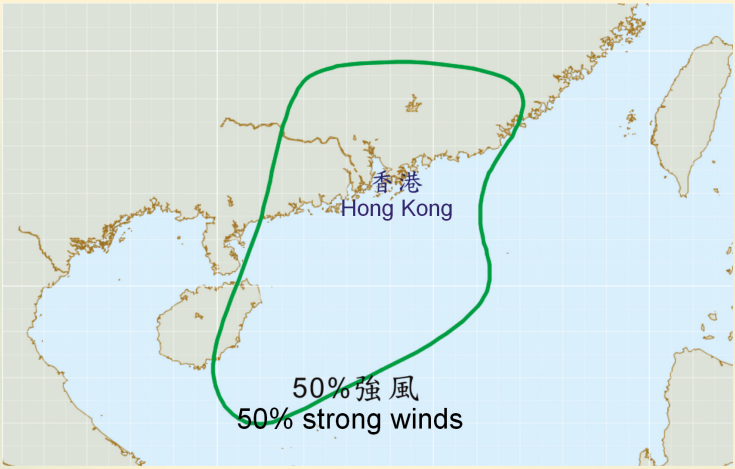
請不要怪我用了這個標奇立異的題目。每有壞天氣來襲，天文台需要發出警告時，時常受到一定的壓力，颱風情況下尤甚。如果太早發出熱帶氣旋信號，可能會有一兩天風和日麗、陽光燦爛的天氣，市民才開始感受風雨的影響。如果信號發出太遲，預警不足，便會冒生命財產損失的風險。

事實上，天文台同事在發出警告信號前數天，已經開始監察熱帶氣旋的發展。這些工作牽涉長時間的緊密監察及24小時的詳細分析。為此，天文台在過去數十年發展了一些分析工具，供預報員使用。在風雨來臨緊迫的氣氛下，天文台同事苦中作樂之餘，為這些工具起了有趣的名字，紓緩一下。

Forgive me for this rather weird title. The Observatory is under some pressure when it comes to warning people of approaching weather, especially typhoons. Too early a tropical cyclone signal is issued, the public may be baked in brilliant sunshine a couple of days before the effect of the storm is felt. Too late, and Hong Kong will risk the loss of life and properties because of inadequate forewarning.

As a matter of fact, Observatory colleagues start monitoring the development of a tropical cyclone days before a warning signal is issued. The work involves long hours of close watch and detailed analyses round-the-clock. Over the past few decades a number of tools for such analyses have been developed for the forecaster use. The device of funny names for these tools is a welcome relief.

As a tribute to Observatory colleagues, this blog introduces what are known to them as 'kidney' and 'beach ball'. Some




圖一：颱風襲港時有50%機會於橫瀾島引致強風的「區域」

Figure 1 : The 50% probability 'area' for strong winds at Waglan during the passage of a typhoon

本網誌介紹天文台預報員所熟悉的「豬腰」和「沙灘球」，作為對員工們的致意。為了分享這些科學知識，我們曾經在天文台一年一度的開放日及研討會中介紹過一些工具給市民，同時也觸發了互聯網論壇上一些有趣討論。

什麼是「豬腰」？為何有此命名？簡單來說，它代表了地圖上的一個特定區域：當熱帶氣旋進入這個區域時，香港某地點便可能會吹起大風。圖

of the tools have been presented to the public, notably in the annual Observatory Open Day and in seminars, as a sharing of scientific knowledge. This has generated considerable interest in Internet forum discussions.

What is a 'kidney' and why is it so called? Simply, it represents an area on the map where it is probable that windy conditions will affect a location in Hong Kong once a tropical cyclone comes within that area. Figure 1 shows a 50% probability 'kidney' for strong winds (i.e. force 6) at Waglan during the passage of

一是一個颱風（本文所指的颱風是泛指颱風、強颱風或超強颱風）襲港時有五成機會於橫瀾島引起強風（即六級風力）的「區域」。颱風屬熱帶氣旋中最強的級數。

上一段提及的50%概率的意義是，根據以往影響香港的颱風紀錄，其中一半的颱風於概率曲線內曾為橫瀾島帶來強風。橫瀾島是香港中環東南約20公里的一個外島。圖一中曲線的形狀就是這個工具名字的由來。曲線往西南方面伸延的意義是，當一個風暴集結在香港西南時，橫瀾島（及整體上香港而言）會較為當風。

那麼預報員怎樣利用這一個工具呢？只要把曲線放在風暴的預測路徑之上，正如圖二所示，我們便可以估計風暴何時會為橫瀾島帶來強風，以及風勢何時開始減弱。

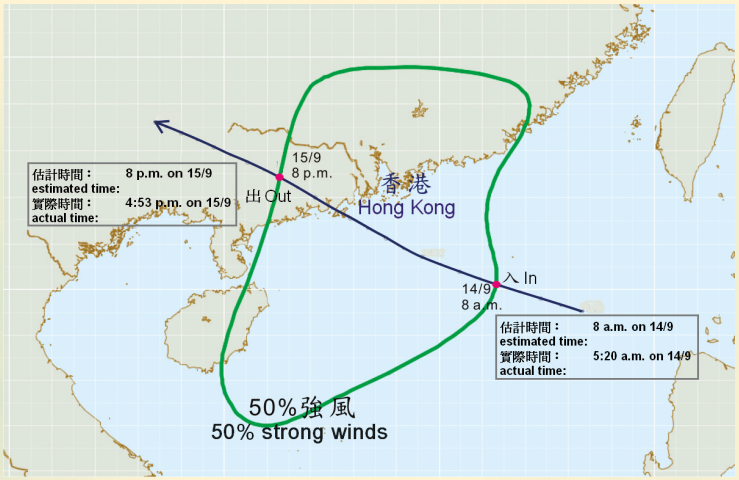
圖三是30%、50%及70%的曲線。其中70%的概率曲線

a typhoon (the term 'typhoon', used in this blog covers typhoons, severe typhoons and super typhoons). Typhoon is the strongest amongst all categories of tropical cyclones.

The 50% probability means that according to past records of typhoons affecting Hong Kong, half of those located inside the curve had brought strong winds to Waglan, an outlying island about 20 kilometres southeast of Central, Hong Kong. The shape of the curve in Figure 1 gives the tool's namesake. The curve's elongated shape towards the southwest also tells us that Waglan (and Hong Kong as a whole) is more exposed when the storm is located to the southwest of Hong Kong.

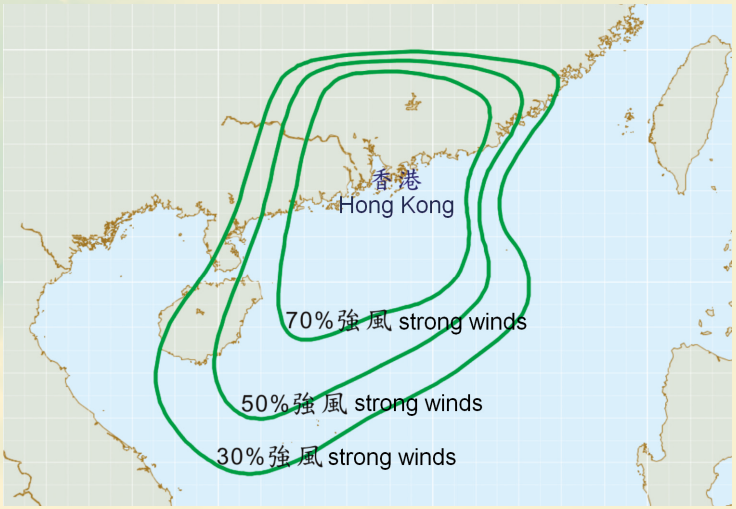
So how would a forecaster use this tool? What he/she does is to overlay it onto the predicted storm track. This gives an indication of the time when the storm will give strong winds at Waglan, as well as when the winds will start to decrease, as shown in Figure 2.

Figure 3 presents the 30%, 50% and 70% curves. The 70% probability curve means a 70% chance of strong winds at Waglan once a typhoon comes within that




圖二：2009年颱風「巨爵」影響香港期間利用圖一（a）曲線預測有50%機會於橫瀾島吹強風的起始及終結時間，可見與實況相差約三小時。藍線是巨爵的預測路徑。

Figure 2 : Start and cessation of strong winds at Waglan Island during the passage of Typhoon Koppu in September 2009 based on estimation using the 50% probability 'kidney'. The estimated times differ from the actual by about 3 hours. The blue line shows the forecast track of Koppu.




圖三：颱風影響香港期間有30%，50%及70%機會於橫瀾島吹強風的概率曲線

Figure 3 : The 30%, 50% and 70% probability for strong winds at Waglan brought by typhoons.

表示當有颱風進入該區域時，橫瀾島會有70%機會吹強風。順理成章，這一條曲線覆蓋面積比50%的曲線為少，後者也比30%的曲線為少。如何取捨這些曲線？預報員會評估風暴本身範圍的大小，當風暴範圍大時會採用一個較少概率的曲線，而面積範圍較少的風暴則採用一個較大概率的曲線。

對於不同級別的風暴，例如熱帶低氣壓、熱帶風暴或強烈熱帶風暴，需要採用另外一套不同的概率曲線。當風暴有跡象增強或減弱時，預報員可能需要使用超過一套的曲線作參考。此外，亦有為其它地點而設的曲線，例如維多利亞港及機場等地。

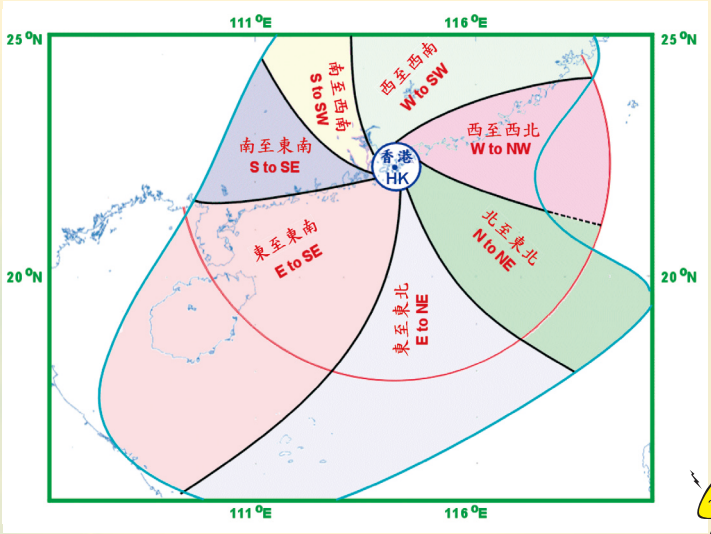
圖一、二及三帶出了一個信息，當風暴集結在香港的西南時，橫瀾島是比較當風的。不過，這些曲線並沒有告訴我們風會從甚麼方向吹來。為了斷定風向，需要使用一個稱為

region. Naturally it is smaller than the 50% one, which in turn is smaller than the 30% one. How to choose among these curves? The forecaster assesses the extent of the storm itself, and may adopt a smaller probability in the case of an extensive storm and a higher probability for a compact storm.

For a different storm category such as tropical depression, tropical storm or severe tropical storm, you need a different set of probability curves. The forecaster may have to grapple with more than one set of curves when the storm shows signs of intensification or weakening. There is also a different set of curves each for other locations such as Victoria Harbour and the airport.

Figures 1 , 2 and 3 tell us that Waglan is more exposed when the storm is located to our southwest. Well, they don't tell us where the winds are going to come from. To determine the wind direction, you need a 'beach ball'. An example of this is given in Figure 4.

Looking at Figure 4, there is probably no need to explain why the tool is called




圖三 ：熱帶氣旋集結在特定區域時橫瀾島的盛行風向

Figure 3 : Diagram showing the prevailing wind direction at Waglan when a tropical cyclone is located in a particular sector

「沙灘球」的工具。圖四是一個例子。

圖四清楚表達這個工具被稱為「沙灘球」的理由。當一個風暴集結在香港的西南時，例如在海南島附近，橫瀾島會吹東至東南風。

以上的工具是經過多年的經驗及長時間的觀察累積所得。舉例，橫瀾島氣象站是1952年建立的，距今差不多60年。這些工具是本土知識累積

a 'beach ball'. Thus, a storm located to the southwest of Hong Kong, say near Hainan Island, will bring east to southeasterly winds to Waglan.

The above tools were possible after years of experience and the accumulation of long periods of observations. The weather station at Waglan, for example, was established nearly 60 years ago, in 1952. The tools are a result of local knowledge.

The importance of 'local knowledge' cannot be over-emphasized. Take global



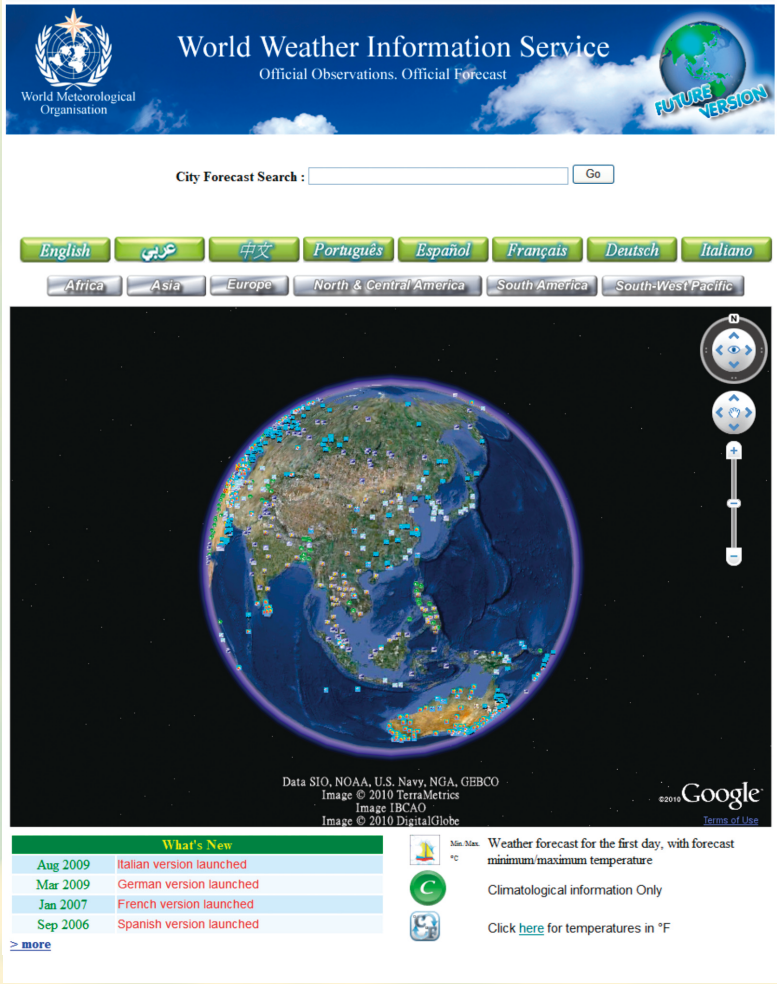
沉澱的成果。

故此，我們不能忽視本土知識。以全球天氣預測為例，現時有很多便宜的天氣模式正在運行，而此類模式僅需要一台個人電腦便可運作。這些模式是否準確？答案是不一定。事實上，這些模式曾經預測香港會有40℃的高溫，但香港有記錄以來錄得的最高氣溫，不外是天文台總部的36℃，以及本港境內其它地方錄得的38℃。

由於這個原因，自2000年起天文台為聯合國世界氣象組織開發了世界天氣信息服務（WWIS）。天文台的電腦每天收集了世界上超過 1,300個城市的最新天氣預測，並自動將資料放在網站上，供全世界人士免費瀏覽。這些天氣預測來自世界上超過120個氣象機構，同時設有八種語言。它們是官方發出的預測，也是利用當地本土知識作出的，即使現今世

weather forecast as an example. There are many inexpensive weather models in operation nowadays, some requiring the power of only a desktop personal computer. Are they accurate? Well, not necessarily. As a matter of fact, 40°C had been predicted for Hong Kong in day-to-day forecasts, whereas the highest temperature ever recorded in Hong Kong was 36°C at the Observatory headquarters and 38°C elsewhere within the territory.

It was for this reason that the Observatory, acting on behalf of the United Nations World Meteorological Organization developed the World Weather Information Service (WWIS) in 2000. Day in and day out, the latest weather forecasts for over 1,300 cities in the world are collected by a computer at the Observatory and automatically put on a website for free access by everybody. The weather forecasts come from a total of over 120 weather services from around the world and are available in eight languages. These are official forecasts, and are based on local knowledge that even the best weather prediction models in the world may not be




圖五：世界天氣信息服務的「未來版本」

Figure 5 : 'Future Version' of the World Weather Information Service

界上最好的天氣預測模型也無法媲美。

今年，WWIS有了新的「未來版本」，是以地理信息系統作平台開發的。這個版本目前正在上海2010世界博覽會中展出。它允許用戶在一個虛擬地球上毫無拘束地平移，滾動，放大和縮小，迅速抵達心儀的城市，並且瞬間顯示未來三至七天的天氣預報。下次出外旅遊時，記著使用這服務：http://future.worldweather.wmo.int/。

李本瀅

2010年9月17日

able to replicate.

This year, a 'Future Version' of WWIS has been developed and is GIS-enabled (GIS stands for Geographic Information System). Now being showcased at the World Expo 2010 in Shanghai, it allows the user to freely pan, scroll, zoom in and out of the virtual globe, and quickly get to the city of interest where the weather forecast, some up to 3 to 7 days ahead, is instantaneously displayed. Next time you go abroad, be sure to use this service : http://future.worldweather.wmo.int/.

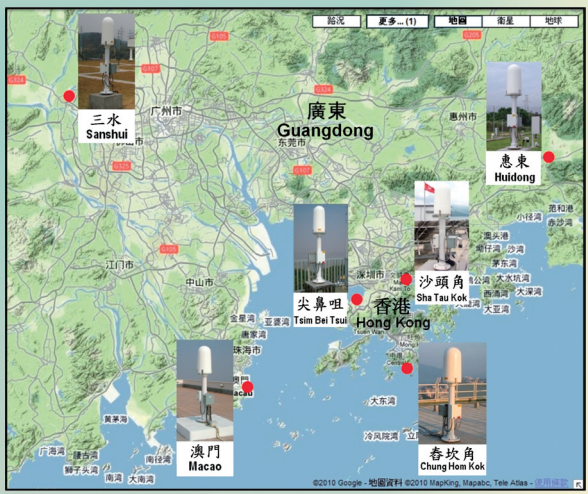
LEE Boon-ying

17 September 2010

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# 如何點算閃電？

## How is lightning counted?




圖一：天文台的閃電定位網絡（背景地圖源自Google Maps）

Figure 1 : The Observatory's lightning location network (Background map courtesy of Google Maps)

九月八日（星期三）晚香港受大雷雨影響，從下午9時至翌日早上3時，本港共錄得超過25,000次的閃電。

閃電威脅戶外人士的安全。香港的閃電定位網絡於2005年建立，探測香港及其鄰近地區的閃電活動。該網絡共有六個探測站（圖一），其中

On 8 September (Wednesday), Hong Kong experienced heavy thundershowers. From 9 p.m. to 3 a.m., more than 25,000 lightning strokes were recorded in the territory.

Lightning poses danger to people engaging outdoor activities. Hong Kong's lightning location network was established in 2005 to detect lightning in and around the territory. The network consists of 6 lightning detection stations, as shown

三個在香港境內、二個位於廣東、一個位於澳門。在廣東及澳門的三個探測站是分別和廣東省氣象局與澳門地球物理暨氣象局合作建成的。網絡佈點伸展至珠三角地區，以便探測較遠的閃電，盡早提醒市民。

究竟，怎樣才算是一次閃電？

每一次閃電都會產生電磁波。閃電探測站的儀器能測量到電磁波及其相關的電壓。電磁波須具備某些特徵，電壓亦須超過一定水平，通過儀器的品質監控後，才算是一次閃電記錄。

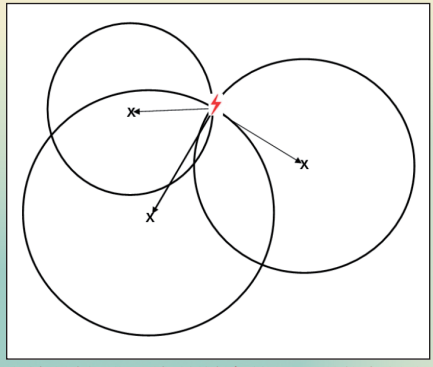
閃電產生的電磁波會向四方八面擴散，到達每一個探測站的時間亦有所不同。從圖二顯示，由於電磁波不同時間抵達，時間差是可以用來推算閃電的位置。這種算法名為「三角定位法」，已有一段歷史。地震也用類似方法定位，差別

in Figure 1: three in Hong Kong, two in Guangdong, and one in Macao, the latter three being implemented in co-operation with the Guangdong Meteorological Bureau and Macao Meteorological and Geophysical Bureau. The stations are spread out so that lightning from afar can be detected, and this enables earlier alerts to the users.

First, what constitutes a lightning event?

Every time there is lightning, an electromagnetic wave is generated. When it reaches a lightning station the sensor there measures the wave and the voltage associated with it. To go through the necessary quality assurance, the wave has to meet certain characteristics and the voltage has to exceed a threshold for the lightning event to be treated as a genuine one.

Now the electromagnetic wave from lightning travels in all directions. It reaches the lightning stations at different times. As depicted in Figure 2, the different arrival times at the stations enable the lightning event to be located. The mathematical process, called triangulation, has been with us for a long time. Earthquakes are located



圖二：閃電信號抵達探測站時間會有所不同，故能定出閃電位置。
（⚡代表閃電，x 代表閃電探測儀器）
Figure 2 : Lightning signal reaches the stations at different times and this enables location of lighting.
('⚡' represents the lightning location; 'X' represents a lightning detection sensor).

在於地震產生的是震顫而不是電磁波。現時「全球定位系統」衛星可以找出汽車位置，方法也是基於同樣原理。

從圖二可見，三個探測站便能定出閃電的位置。目前的六個探測站可提供超量的信息，產生數據重疊。這些額外信息用於數據覆檢和精確度上，能增加閃電定位的可靠程度。

那麼，是如何計算閃電的次數？能夠通過上述方法而成

in very much the same way, the only difference is that an earthquake sends out tremors instead of electromagnetic waves. These days, a car's position is determined by GPS (Global Positioning System) satellites using the same principle.

Figure 2 tells us that three stations are all it takes to locate a lightning event. The current 6-station network may give us more information than necessary, resulting in data redundancy. The surplus information enables double-checking and precision, and improves the reliability of the lightning location.

功定出位置的事件，便算是一次閃電。

市民可以從流動電話、天文台網站 (http://www.weather.gov.hk/wxinfo/llis/indexc.htm)、「打電話問天氣」服務（187 8200）和每小時天氣報告得到最新的閃電信息。其中在流動電話和天文台網站推出的閃電戒備服務廣受歡迎，用家可自選多至三個警戒範圍（例如5公里、15公里和30公里）。當有閃電發生在警戒範圍內，該服務會自動發出警示。圖三顯示閃電戒備服務的一個例子。這項服務能幫助用家就泳池開關或戶外活動安排（如行山和燒烤等）時作出決定。

李本瀅，馬偉民

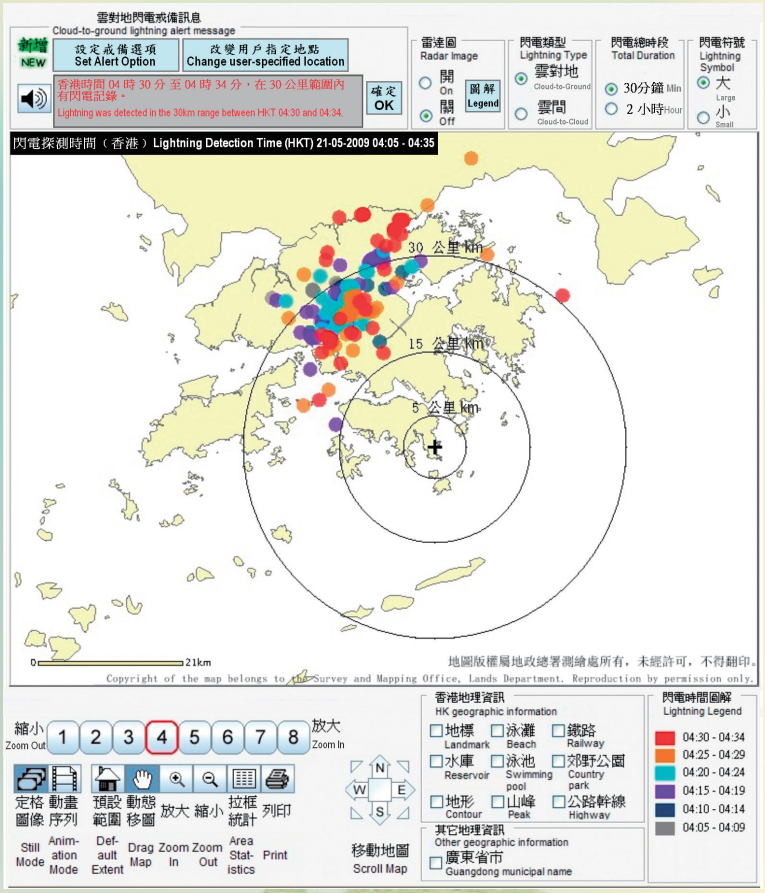
2010年9月24日

So how is lightning counted? A lightning is counted when it is successfully located in the manner described above.

The latest lightning information is made available to the public through various channels: mobile phones, the Observatory's website (http://www.weather.gov.hk/wxinfo/llis/index.htm), the dial-a-weather service (187 8200) and the hourly weather bulletins. One very popular application on mobile phones and on the Observatory's website has been the lightning alert service, where a user is automatically prompted whenever lightning is located within range, say 5 km, 15 km or 30 km. The user can have up to three ranges of his/her choice. An example is given in Figure 3. The service can facilitate users to operate their swimming pools and decide on outdoor activities such as hiking and barbecuing.

LEE Boon-ying, MA Wai-man

24 September 2010




圖三：當特定範圍內錄得閃電，系統便會發出戒備信息（左上角位置）和聲響提醒用戶。

Figure 3 : Users will be alerted with a message (upper left) and an alarm when lightning is detected within a specified range.

# 蕭邦200年

# Chopin 200



蕭邦（1810至1849年）（圖片來源：維基百科）
Frederic Chopin (1810 to 1849) (Image source: Wikipedia)

今年世界各地均有慶祝蕭邦（1810至1849年）誕生200年的活動。

首次接觸蕭邦的音樂是兒時雙親帶我們進電影院的時光。電影是《紅樓琴斷》，演員是泰倫鮑華（1914至1958）和金露華。影院是放映二輪電影的，相信該電影許多人沒看過，特別是年青人。但片中主題曲是《降E大調夜曲》，今天聽來仍然觸動心弦。

This year the world commemorates the 200th anniversary of the birth of Frederic Chopin (1810 to 1849).

My first contact with Chopin was an old movie, “The Eddy Duchin Story”, starring Tyrone Power (1914 to 1958) and Kim Novak. My parents took us to a second-timer cinema for the movie's replay, so I am sure not many of you know about it. What I am sure is that many of you must have heard the movie's theme music-Chopin's Nocturne in “E flat major”, which still touches the heart every time I listen to it.

蕭邦在許多鋼琴樂曲類別上均有創新，別樹一幟，夜曲是其一。法國音樂家聖桑（1835至1921年）曾說過，蕭邦音樂的昇華美態，「徹底改變了音樂藝術，並敞開所有現代音樂的大門」。

提到夜曲，愛爾蘭作曲家斐爾德（1782至1837年）應可說是浪漫時代夜曲的鼻祖。

上述夜曲《降E大調》相信是蕭邦二十多首夜曲中最出名的。它是作曲家初次出版三首夜曲（作品第九號，1833年）中的第二首，作曲時約19歲。第一首《降B小調》在一些商業廣告中常聽到。曲中開首及結尾的旋律如果令人聯想到夜間、黃昏或拂曉，那麼中段的旋律便是明亮的白晝，夏日大自然的寧靜，令人舒暢，忘卻一切煩惱。而第三首《B大調》則較少聽到，但其給人別具一格感覺已令作曲家擺脫了斐爾德的影響。

Nocturne was among the many genres in piano music on which Chopin made major innovations. In the words of Camille Saint-Saens (1835 to 1921), the sublime beauty in his music 'revolutionized the art form and opened the way for all modern music'.

Speaking of nocturnes, the Irish composer John Field (1782 to 1837) was generally viewed as the father of the Romantic nocturne.

The aforementioned Chopin's Nocturne was perhaps the best known among his over 20 nocturnes. It was the second among the three nocturnes he first published (Opus 9 in 1833), composed while he was about 19. The first of these three, "B flat minor", is popularly heard in commercial advertisements. If one associates the leading melody (repeated in the conclusion) with nighttime, evening or dusk, then the following melody in the middle must allude to a warm, quiet summer day that brings relief and light-heartedness. The third, "B major", is rarely heard but demonstrates such a significant innovation that extends beyond Field's influence.

故此，蕭邦的夜曲不單僅僅只有「夜」的情緒。它們超越了大自然的夜景，或月色掩映下情侶的幽會，令我們想起夜鶯婉囀、夏夜在懷抱中的恬靜和陶醉、在湖邊對未來的遐思，以及狂風暴雨過後勾起的惆悵。這些夜曲甚至將聽者帶到寺院神遊冥想，或在樹影婆裟的墳地躑躅徘徊。

如果要推薦蕭邦夜曲的一些錄音，具歷史性的彈奏會是柏德路斯基、柯托及列柏提等名師。近數十年錄音則會是巴倫邦或波連尼。須要聲明，我的聽樂欣賞經驗尚淺，選擇亦可能因個人喜惡而有所偏頗。

多首夜曲中，個人最愛是《降E大調》（作品55號第二首）。音樂極富古典氣息，由普哥利殊娓娓奏出，像對我們傾訴，並向現今世界宣示其溫馨的傷感和淡淡的哀愁。

Thus, the emotion brought by Chopin's nocturnes is not confined to the word 'night'. They extend beyond nature's night scene and lovers' secret meetings under the moonlight. They remind us of nightingales' songs, the warmth and dreaminess of a summer night, contemplation by the lakeside, and the sense of loss and helplessness after thunderstorms. They may even allude to wanderings in a graveyard and meditation in a church or monastery.

If I were to recommend recordings of Chopin's nocturnes, it would have to be those by Paderewski, Cortot and Lipatti in bygone days, or Barenboim and Pollini in recent decades. But my listening experience is very limited and the choice very personal.

My favourite among these nocturnes is the “E flat major” (Opus 55, No. 2). Classical in every sense and lovely played by Pogorelich, it speaks to, and looks forward to, the modern world with its warm sentimentality and mild nostalgia.

Of those Chopin nocturnes published posthumously, the most well-known perhaps is the “C sharp minor”.

作曲家離世後才出版的夜曲中，以《升C小調夜曲》最廣為人知 。它因為 2002 年奧斯卡得獎電影《鋼琴戰曲》而聞名於世。對於香港電台古典音樂頻道聽眾來說，它是《醉人的音樂》的主題曲，由小提琴及樂隊奏出。該節目的主持人陳浩才先生剛於7月辭世。他的聲音自1960年出現於大氣電波，至今年剛好半個世紀，伴隨好幾代樂迷的成長。

李本瀅

2010年9月30日

It has been popularized in “The Pianist”, the Oscar-winning movie in 2002. To those listening to Radio Television Hong Kong's classical music channel, it was the theme music, played in violin and orchestra, for “Enchanting Music”. Hosted over the past 50 years by Mr CHAN Ho-choi, who passed away in July aged 75, the programme must have charmed generations of music listeners.

LEE Boon-ying

30 September 2010

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# 美妙生命
# Wonderful life

「當『Opabinia』的繪圖呈現在牛津一個古生物學會會議時，得來的反應是哈哈大笑，相信是對該怪異生物的一個反應。」以上是古生物學家惠廷頓（1916年出生）1975年一篇學術論文開場白。他於早前逝世。

加拿大英屬哥倫比亞省洛磯山脈的百吉斯頁岩出土了很多古生物化石，惠廷頓是因揭露這些光怪陸離生物而聞名。百吉斯頁岩是因蘊藏五億多年前（中寒武紀）豐富化石而知名。相比下，這些化石比恐龍（二億三千萬年至六千五百萬年前）年代更為久遠。該頁岩為華盛頓史密森學會查理士・沃爾科特（1850至1927年）於1909年發現。

"When a figure of 'Opabinia' was shown at a meeting of the Paleontological Association in Oxford, it was greeted with loud laughter, presumably a tribute to the strangeness of this animal." Thus began a 1975 monograph by the paleontologist, Harry Whittington (born 1916), who passed away recently.

Whittington was the first to expose the extraordinary animals of the Burgess Shale in the Canadian Rockies of British Columbia. Burgess Shale is famous for the preservation of fossils over 500 million years old (Middle Cambrian). This was long before the age of dinosaurs, that is, 230 to 65 million years ago. The place was discovered in 1909 by Charles Walcott (1850 to 1927) of the Smithsonian Institution in Washington DC.

After graduating from Birmingham University in the United Kingdom and completing a fellowship at Yale University, Whittington became a lecturer in Burma (now Myanmar) and then taught

惠廷頓早年於英國伯明翰大學畢業後，往耶魯大學進行研究工作。後到緬甸任職講師，並曾於四川成都擔任教職，於二戰後返回伯明翰。

1960年代，惠廷頓已是三葉蟲專家，受邀為加拿大地質調查所牽頭研究百吉斯頁岩化石。1960至1980年代間，他與兩位劍橋研究生聯手進行一些傳統分析。方法包括樣品剖割、多角度攝影、以及紫外線應用等。披荊斬棘後，他們發覺頁岩的古生物比當時的既有認識更千奇百怪。

究竟這些古生物有多古怪？可以看看圖一中「Opabinia」的繪圖。生物本身僅長數厘米，名字源於英屬哥倫比亞省內的一處地方。它最怪異的地方是頭上擁有五隻眼睛。這些眼睛外表均呈莖狀：頭前方兩隻、後方兩隻、第五隻則在後方兩眼中間。

in Chengdu, Sichuan Province, before returning to Birmingham after World War II.

Already an expert in trilobites, Whittington was invited in the 1960s to head a Geological Survey of Canada investigation of Burgess Shale. Together with two graduate students at the University of Cambridge, he found that the animals represented by the fossils there were much stranger and more diverse than had previously recognized. Their painstaking work, mostly between the 1960s and 1980s, involved traditional methods such as sample dissection, photographs of samples from different angles, and use of ultraviolet light.

How strange are the Burgess Shale animals? Take a look at 'Opabinia' in Figure 1, which measured a few centimetres long. The name was derived from a place called Opabin pass in British Columbia. The most unusual feature is that it had five eyes. The eyes were all stalked : two near the front of the head, two at the rear and a central one between the rear two.



圖一：「Opabinia」（來源：維基百科，作者：Nobumichi Tamura）
Figure 1 : 'Opabinia' (Source : Wikipedia, Author : Nobumichi Tamura)

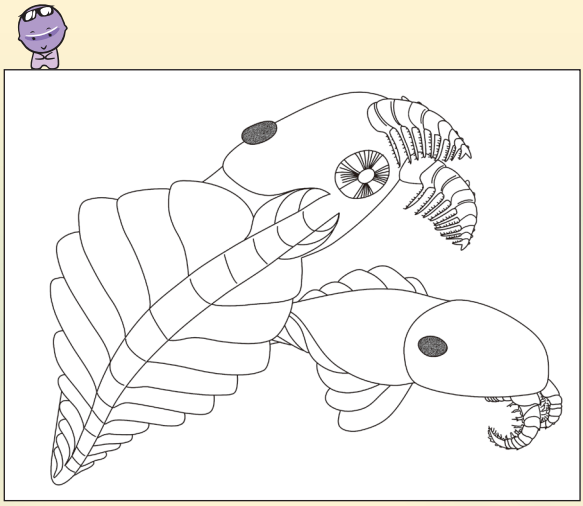
「Opabinia」頭前方伸出一條長管，佔整體長度三分之一。長管的形狀是先向下，再向前及向上彎曲，好像象鼻一樣，用途相信是將食物送進口部。圖一沒有顯示，其實口部是向後的。

另外值得留意生物身體兩旁有十五對「腮片」，以及船舵狀的尾部。科學家相信「Opabinia」於海床上獵食。現時我們知道該生物可溯源至現今節肢動物的一個早期分支。

There was a proboscis at the front, taking up a third of the animal's length. It probably passed food to the mouth, which faced backward (not shown), by projecting downwards and then curving forwards and upwards, like an elephant's nose.

Also note the fifteen 'gill blades' on both sides of the body, and the rudder-like tail. Scientists believe it was a seafloor feeder. People now know that 'Opabinia' had branched out from an early lineage of modern anthropods.

As another example of the weird animals in the Burgess Shale, let's take a look at 'Anomalocaris' in Figure 2, which



圖二：「Anomalocaris」（參考資料：“Wonderful life”）
Figure 2 : ‘Anomalocaris’ (Reference : ‘‘Wonderful life’’)

百吉斯頁岩的古生物中，另一個稀奇古怪的例是圖二的「Anomalocaris」，意即「非常蝦」，長度可達一米，為中寒武紀最大動物之一。它有一個頗大的頭，一雙眼及狀似菠蘿片的碟形口部。口部前方有兩隻大臂或附鉗，滿佈尖刺。「Anomalocaris」身體呈流線形，相信是方便於中寒武紀海洋中游弋，伺機捕獵。

means 'abnormal shrimp'. Measuring a metre long, it was among the largest of Cambrian animals. It had a large head, a pair of eyes and a disk-like mouth resembling a pineapple slice. In front of the mouth, there were two large 'arms', or appendages, with barb-like spikes. The streamlined body probably allowed the creature to swim through Cambrian waters, looking for preys.

Whittington was a very modest person. It took a popular science book in 1989, “Wonderful Life”, written by Stephen Jay Gould (1941 to 2002), a Harvard professor, to generate considerable public

惠廷頓秉性謙虛。他的傑出成果要待1989年哈佛教授史提芬・古特（1941至2002年）的科普暢銷書《美妙生命》才廣為人知。雖然百吉斯頁岩古生物的特異奇彩是一項重要發現，惠廷頓一直都以謙遜及嚴謹態度處之，取得的研究成果均建基於充分的證據。無怪乎古特說，惠廷頓的論文開場白低調含蓄，足可在科學史上廣為傳誦。

李本瀅

2010年10月8日

interest. The strangeness of the Burgess Shale fossils was an important discovery, and Whittington came to his new results from a weight of evidence. Yet he handled it with humility and rigour. No wonder Gould said that the beginning statement of Whittington's monograph "should go down as one of the most remarkable in the history of science".

LEE Boon-ying

8 October 2010

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3. Wikipedia.

# 三度彩虹
# Triple rainbow




圖一
Figure 1

月前報導本港看見雙彩虹。剛巧4月1日《台長網誌》早已介紹該現象。

二不離三，收到同學一張照片（圖一），上有三度彩虹，是2006年6月在新界沙田往西面拍攝的。

There was a report of double rainbow observed in Hong Kong recently. It so happened that I talked about this phenomenon in an earlier blog (1 April 2010).

As if these are not enough, I received a photograph (Figure 1) from a college alumnus showing three rainbows. The picture was taken in Shatin, New Territories, in June 2006, looking towards the west.



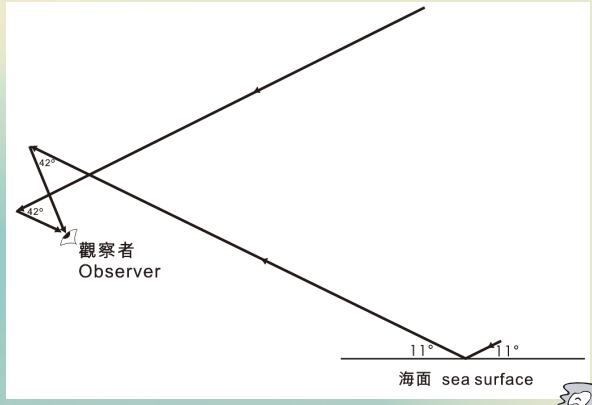

圖二
Figure 2

分析結果是，照片顯示了正常的雙彩虹（圖一的「1」及「2」），而第三度彩虹（圖一的「3」）是由於海面反射而成。

資料顯示當天天氣不差，早上有驟雨，沙田區錄得幾毫米雨量。拍照時間是早上7時前。太陽的方位角應是約70度。從照片中一所大廈的投影估算，太陽離地平線約11度（即天頂角度距79度）。圖二顯示太陽與觀察者（即照相機）的相對位置。

The explanation is that on top of the usual double rainbow (labelled '1' and '2' in Figure 1), we get another bow (labelled '3') because of reflection from the sea surface.

The weather that day was reasonable with some showers that morning, including a few millimetres of rainfall recorded in the area of Shatin. The time the picture was taken was before 7 a.m. Our record indicates that the Sun's position (azimuth) was 70 degrees from north. In the picture, the shadow cast by a building suggests that the Sun's elevation is about 11 degrees (or zenith angle of 79 degrees). The map in Figure 2 shows the Sun's orientation relative to the observer (i.e. camera).




圖三
Figure 3

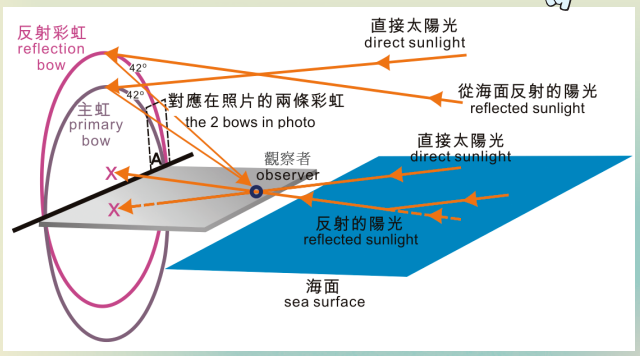
4月1日《台長網誌》談及，主虹（圖一的「1」）成因是雨點內反射，依循42度的一定方向改變（圖三將會提供解釋），進入眼簾。

而副虹（圖一的「2」）則是由於雨點內兩次反射而成。

第三度彩虹（圖一的「3」）成因並非直接來自太陽光，而是源於海面反射。我們就叫它「反射彩虹」。圖三解釋上面提及的角度及其相互的關係。圖一可以看到，主虹

As explained in the blog of 1 April 2010, the primary rainbow (labelled '1' in Figure 1) arose from reflection inside raindrops. The colour band was formed from many raindrops at different places, where light rays coming out of the raindrops happened to reach the observer. In the process, a change of 42 degrees in the direction of sunlight was always involved (see the explanation later in Figure 3). The secondary bow (labelled '2' in Figure 1) was produced when the sunlight was reflected twice inside the raindrops.

The third bow (labelled '3' in Figure 1) was brought not directly by the Sun, but by sunlight reflected from the sea surface.




圖四
Figure 4

及反射彩虹的顏色次序是一樣的，副虹則相反。

圖四嘗試用三維視角闡明這現象。圖中的「A」框代表照片所拍攝到主虹及反射虹的範圍。

外國亦有報導反射彩虹。但從香港的例子看，這現象仍然令人嘖嘖稱奇。

李本瀅，趙孔儒
2010年10月15日

Let's call this the reflection rainbow. The relationship between the angles is explained in Figure 3. You may notice that the primary and reflection bows have the same colour sequence, while the secondary bow has a reverse sequence.

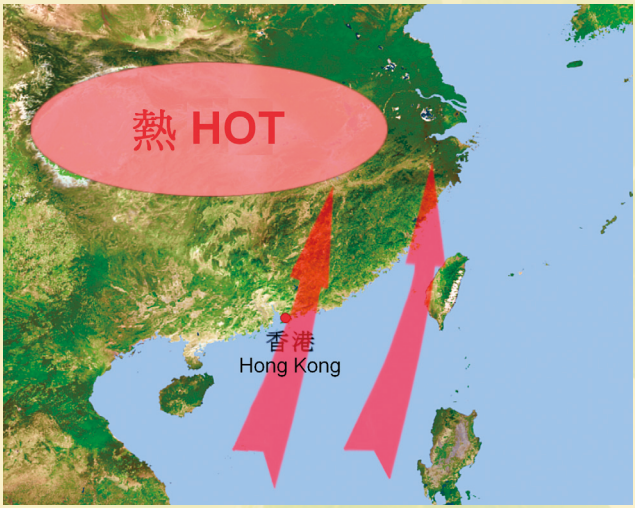
Figure 4 presents a 3-dimensional view of what happened. 'A' in the diagram represents the region captured on the photograph that day in respect of the primary and reflection bow.

Reflection rainbow has been reported elsewhere around the world. But it never ceases to amaze, as shown by the example here in Hong Kong.

LEE Boon-ying, CHIU Hung-yu
15 October 2010

# 季候風與氣候變化

## The monsoons and climate change



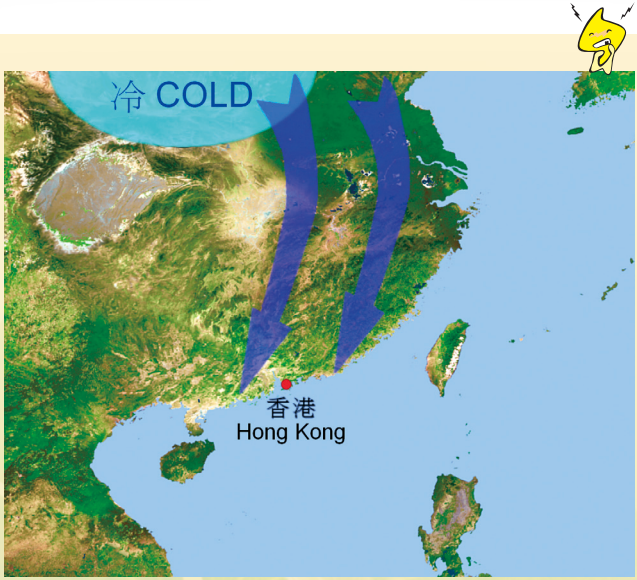

圖一：東亞地區夏季季候風示意圖
Figure 1 : A schematic diagram of East Asian summer monsoon

人們經常問我氣候變化對亞洲季候風有什麼影響，根據研究結果，兩者之間的關係並非十分明顯。

首先，為何東亞地區會有季候風呢？這是因為亞洲大陸是一塊龐大的陸地所致的。我

People asked us what climate change may mean for the Asian monsoons. Well, if research work on the subject is any guide, the relationship between climate change and the monsoons are anything but simple.

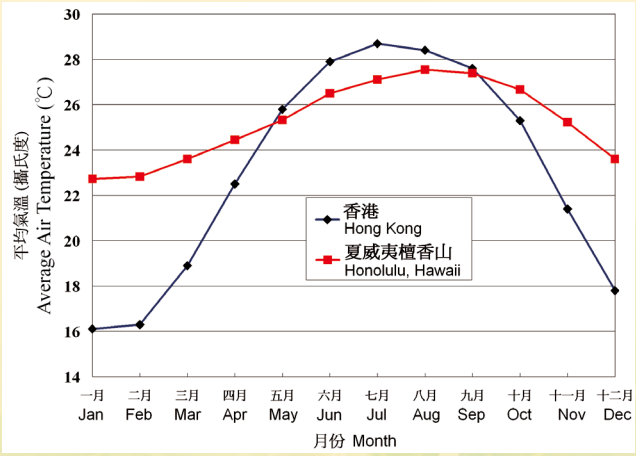
First, what causes the monsoons in East Asia? It is all because of the huge land mass there. In the blog of 30




圖二：東亞地區冬季季候風示意圖
Figure 2 : A schematic diagram of East Asian winter monsoon

在2010年4月30日的網誌中已說明了水比其他物料更難升溫，因此在夏季陽光充沛的日子，亞洲大陸上的空氣會比海洋上的空氣升溫較快，形成海陸之間的溫差，於是產生了由海洋吹往陸地的西南風，這就是夏季季候風出現的大致原因。此外，東亞地區的獨特地形（喜馬拉亞山及青藏高原）亦會對季候風的形成有一定影響。

April 2010, it was explained that among all materials, water is practically the most difficult to heat up. So, during summertime with plenty of sunshine, the air over the Asian land mass heats up faster than that over the ocean. This creates a temperature difference and brings a southwest wind from the ocean towards the land. This is more or less how the summer monsoon comes about, although in East Asia, the peculiar topography of the Himalayas and the Tibetan plateau has an influence on it.




圖三：香港及檀香山(夏威夷)的每月平均氣溫（1971至2000年）

Figure 3 : Monthly average air temperatures at Hong Kong and Honolulu, Hawaii (1971 to 2000)

冬季季候風形成的原因則剛好相反。隨著夏季結束，太陽逐漸往南移使日照量減少，亞洲大陸上的空氣會比海洋上的空氣冷卻得較快。這樣，兩者之間的溫差便產生由陸地吹往海洋的東北風。

為了說明陸地及海洋年頭至年尾的氣溫變化，我們可以比較香港及位於北太平洋上的檀香山（夏威夷）的每月平均氣溫。雖然兩地的緯度相近，

The opposite happens in the case of winter monsoon. As the cool season progress, the sun moves south and the amount of sunshine decreases. The air over the Asian land mass cools down faster than that over the ocean. The resulting temperature difference brings a northeast monsoon from the land towards the ocean.

To illustrate how the air temperature changes over land and ocean during the year, let us compare the monthly average air temperature of Hong Kong with that of Honolulu (Hawaii) over the North

但檀香山位處太平洋一島嶼上，全年的氣候均受海洋影響，從圖三可見檀香山全年氣溫的變化遠較香港為小。

追蹤到達香港的氣團，能讓我們知道氣流從那裏來。圖四及圖五分別顯示了2010年7月及2009年12月的氣流抵港路線圖，從這兩圖可清楚看見夏季時影響香港的氣流主要來自西南方，而在冬季時則主要來自東北方。

研究結果顯示，影響中國的夏季及冬季季候風在過去數十年間呈現了減弱的跡象。科學家認為全球暖化、區域及全球大氣環流改變、太陽輻射量的變化、以至人為氣溶膠（由人類活動產生並釋放至大氣中的微小懸浮粒子，例如：燃燒、使用化石燃料）增加都是導致季候風減弱的原因。

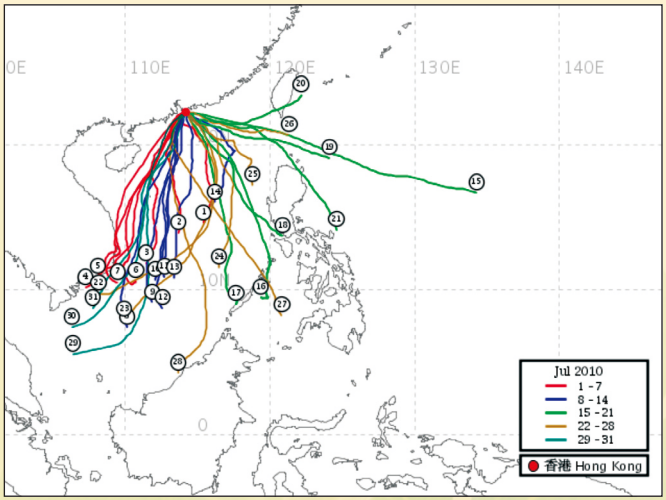
在全球暖化的背景下，過去數十年間陸地上的暖化幅度

Pacific. The two places have similar latitudes, but Honolulu being an island in the Pacific is strongly influenced by the ocean all year round. From Figure 3, one can see that Honolulu's temperature changes much less than Hong Kong.

Tracking of air arriving at Hong Kong gives us an idea of where the air comes from. Figures 4 and 5 below present these tracks for July 2010 and December 2009 respectively. One can see that most of these were from the southwest in summer and from the northeast in winter.

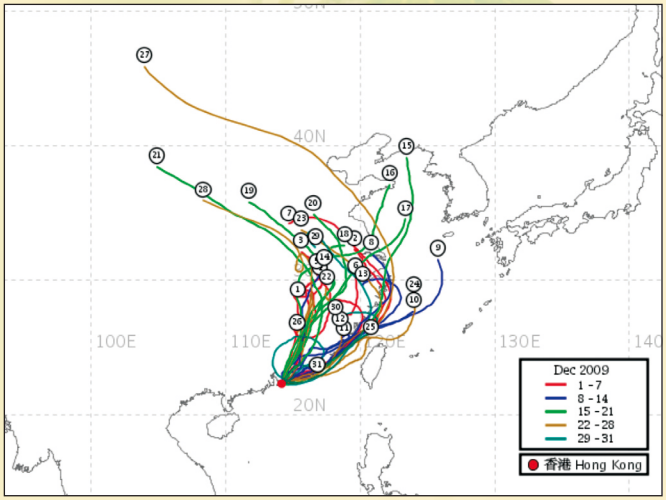
Studies show that both the summer and winter monsoons affecting China have weakened over the past few decades. Scientists think that there are several reasons for such a decrease: global warming, regional and global changes in atmospheric circulation, changes in solar radiation, as well as human-induced aerosols (i.e. tiny particles suspended in the atmosphere, generated by human activities such as burning and use of fossil fuel).

In the context of global warming, the last few decades saw more pronounced warming over land than over ocean,



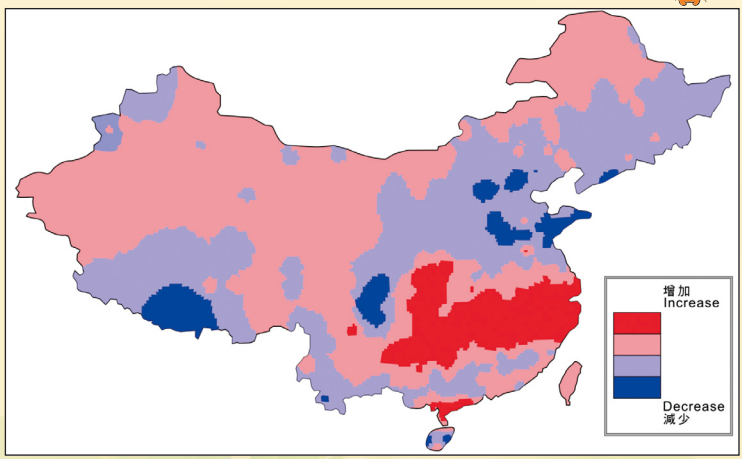

圖四：2010年7月份的氣流抵港路線圖（過去3天的路徑）

Figure 4 : July 2010 - tracks of air reaching Hong Kong, over a 3-day period




圖五：2009年12月份的氣流抵港路線圖（過去3天的路徑）

Figure 5 : December 2009 - tracks of air reaching Hong Kong, over a 3-day period




圖六：1969至2000年間的夏季（6月至8月）平均降雨量趨勢，顯示華中地區（紅色部分）有上升趨勢，但中國東北部（藍色部分）則呈現下降趨勢

Figure 6 : Trend of summer precipitation (June to August), showing on average increased rainfall in central China (red) and decreased rainfall in northeastern China (blue), 1969 to 2000.

比海洋的更明顯，尤其是在高緯度地區。這令海陸之間的溫差減少，從而使冬季季候風減弱。

而夏季季候風減弱的原因則較為複雜。在過去數十年，我們觀察到華中地區在夏季出現降溫趨勢，這降溫現象可能是由於人為氣溶膠的增加令日照減少所致。由於海陸之間溫差減少，造成夏季季候風減弱。這意味著夏季季候風的影

particularly for high-latitude regions. The reduced temperature contrast between land and sea gives a weaker winter monsoon.

Explaining the weakening of the summer monsoon is a little more complicated. This hinges on the summer cooling observed in central China over the past few decades. Such cooling may be linked to an increase in human-induced aerosols which reduces the incoming sunshine. The reduced temperature contrast between land and sea results in a weaker summer monsoon,

響範圍較從前偏南，令夏季時雨帶的位置從北往南移。更多的降雨集中在華中地區將進一步使地面冷卻，這反饋作用令夏季季候風變得更弱。

李本瀅，李子祥

2010年10月22日

which in turn means the southwest wind may not reach as far north as in the past. The end result is the shifting of the summer rain belt from north to south. More rain in central China translates into a further cooling of the land surface, and subsequently an even weaker monsoon.

LEE Boon-ying, LEE Tsz-cheung

22 October 2010




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# 何時才會發出一號戒備信號？

# When should the No. 1 signal be issued?

本月當強颱風鮎魚掠過香港時，市民對天文台為何沒有早一些發出1號戒備信號作出了些討論。

正如給公眾的「香港的熱帶氣旋警告信號」小冊子說明，1號戒備信號是表示有一熱帶氣旋集結於香港約800公里的範圍內可能影響本港。

因此，即使熱帶氣旋進入香港800公里範圍內時，不一定需要發出1號戒備信號。我們要考慮風暴是否會對香港有所影響或威脅才發出信號。過去有許多例子，縱使風暴深入警戒範圍，天文台也沒有發出熱帶氣旋警告信號。原因是根據天文台的判斷，這些風暴對香港並不構成威脅。

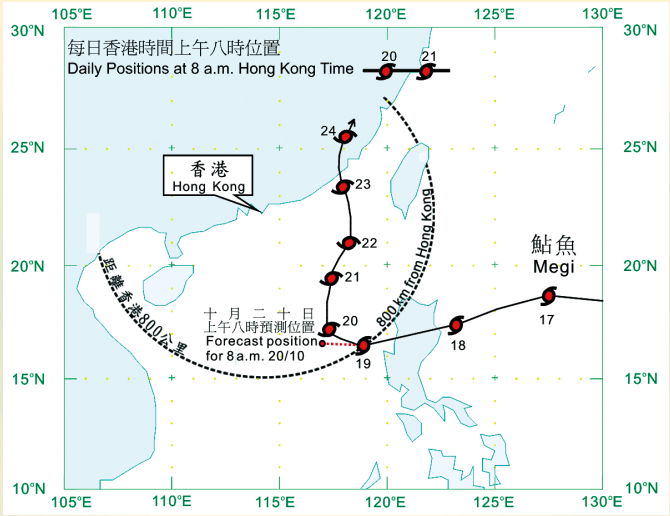
鮎魚進入南海後，於10月19日（星期二）中午左右進入

During the passage of Severe Typhoon Megi this month, there was some discussion in the city querying why the No. 1 Standby Signal was not issued sooner.

As given in the pamphlet "Hong Kong's Tropical Cyclone Warning Signals" for the public, the No. 1 Standby Signal means that a tropical cyclone is centred within about 800 kilometres (km) of Hong Kong and may affect the territory.

Thus, the No. 1 Standby Signal may not be needed even when a tropical cyclone comes within 800 km of Hong Kong. For the signal to be issued, the storm has to have an effect, or impact, on Hong Kong. There had been many cases in the past where no tropical cyclone signal was issued even though the storm was well within the said distance, because the Observatory judged that it posed no threat to Hong Kong.

After entering the South China Sea, Megi came within 800 km of Hong Kong at around midday, 19 October (Tuesday). It was however slow-moving and heading generally westward at the time. This




鮎魚的實況路徑（實綫）及10月19日的未來24小時預報路徑（虛綫）

Megi's actual (solid line) and forecast track (dotted line), 19 October

香港800公里範圍內。當時鮎魚移動緩慢，大致向西移動，並預料在未來24小時繼續採取偏西路徑橫過南海（事實上大致正確）。這樣的移動路徑對香港的威脅不大。

直到10月20日（星期三）日間，鮎魚才開始以較明顯速度向北移動，移向廣東沿岸。由於鮎魚移近香港，開始對香港構成威脅，天文台在當日下午發出1號戒備信號。隨著鮎魚

westerly track across the South China Sea was predicted for the ensuing 24 hours (which was indeed largely the case). Such a track posed little threat to Hong Kong.

It was until the daytime of 20 October (Wednesday) when the storm established a clear northerly track and picked up speed, heading towards the coast of Guangdong. As it was moving closer and started to pose a threat to Hong Kong, the No. 1 Standby Signal was issued that afternoon. This was followed by the No. 3 Strong Wind Signal that next morning as Megi continued to near.



繼續移近，天文台於翌日早上改發 3 號強風信號。

接下來的問題當然是如何確定風暴對香港的威脅。我們會考慮幾個因素，其中包括：風暴的移動速度，風暴是否大致移向香港，風暴的強度（熱帶低氣壓、熱帶風暴、強烈熱帶風暴、颱風、強颱風或超強颱風），風暴的大風區覆蓋範圖，以及其預測途徑及其發展。

發出信號的工作不是靠猜測的。正如我在2010年9月17日的網誌中描述，天文台同事多年來制定了各種科學工具來推算熱帶氣旋對香港的影響，例如，強風或烈風會於何時開始，以及根據風暴的位置本港的風向會如何轉變。這些工具甚至能間接推算，當有冬季季候風出現時對風暴疊加的影響。

我們在決定發出1號戒備信

The next question of course is how to determine a storm's threat to Hong Kong. Several factors are considered, including: how fast the storm moves, whether it is moving generally in our direction, how intense it is (a tropical depression, a tropical storm, a severe tropical storm, a typhoon, a severe typhoon or a super typhoon), how extensive the storm's wind-belt is, as well as its predicted track and development.

This is no guesswork. As explained in my blog of 17 September 2010, Observatory colleagues have over the years developed various scientific tools to estimate tropical cyclones' impact on Hong Kong, such as how soon strong or gale force winds set in, and how the local wind changes direction according to the storm's position. They even allow us, in an indirect manner, to factor in the effect of winter monsoon if it is around.

We take all these into consideration when deciding on the No. 1 Standby Signal. Issuing the signal too soon, the livelihood and operations of some in the marine community may be affected. For a slow-moving storm, it may risk the signal being hoisted for too long. People's

號時都會考慮所有這些因素。如果太早發出信號，可能會影響部份海上作業羣體的生計及運作。對一個緩慢移動的風暴來說，信號發出的時間如果太長，公眾防風措施可能會因此而鬆懈，到風暴真正吹襲時未能作出最好的反應。如果太遲發出信號，公眾會冒生命和財產的損失。決定發出信號時，我們的首要任務是要確保公眾的安全。

天文台高級科學主任陳積祥先生在早前記者招待會上說得好：「風暴移動越快，會越早發出信號。」

李本瀅

2010年10月29日

awareness may wear out, to the point that they may not be well prepared by the time the storm hits. Issuing the signal too late, and we risk the loss of life and property. People's safety is our top priority during the decision process.

Mr. CHAN Chik-cheung, Senior Scientific Officer of Hong Kong Observatory, summarizes it well in a press conference the other day: “The faster a storm moves, the sooner will the signal be hoisted.”

LEE Boon-ying

29 October 2010

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Reference :
Meaning of No. 1 Standby Signal: http://www.hko.gov.hk/informtc/tcsignal.htm



# 唯一能從你那裏奪走的，只有現在

## Let not things future trouble thee



早前報章報導著名投資者巴菲特，其成功之處在於兩點：「追求事實」和「獨立思考」。

其實，二千年前羅馬君主馬可・奧勒留（121至180年）寫作中已提及這些。他的《沉思錄》到現今仍廣泛傳閱，受許多人喜愛，其中包括腓特力大帝（1712至1786年）、歌德（1749至1832年）、美國前總統克林頓及總理溫家寶。

馬可於161至180年在位，是帝國五位仁君最後一位。他本性溫和、不從俗、熱愛家庭和喜歡寧謐生活。雖然自幼以其聰穎坦誠受赫德安皇帝（76至138年）慧眼，他喜歡哲學多於公職。年輕唸書時穿的是

A recent press reported the success story of Warren Buffett, probably the world's best-known investor, attributing it to two principles: seek out the truth; and have independent thinking.

It is of interest to note that a Roman Emperor, Marcus Aurelius (121 to 180), wrote about them two thousand years ago. His “Meditations” is still widely read to this day and has been a favourite of many, including Frederick the Great (1712 to 1786), Goethe (1749 to 1832), former U.S. President Clinton and Premier WEN Jiaobao.

Ruling from 161 to 180, Marcus was the last of the 'Five Good Emperors'. He was by nature gentle, carefree, family-loving and desirous of quiet joy. Despite being Emperor Hadrian's (76 to 138) protégé by virtue of his intelligence and frankness, he preferred philosophy to public duty. As a youngster, he studied while wearing a rough Greek croak,



馬可・奧勒留（圖片來源：維基百科）
Bust of Marcus Aurelius (Image source : Wikipedia)

希臘式樣粗衣麻布，睡覺是躺在硬地上，直至其母苦勸下方休。

對喜歡思想的人來說，當時的羅馬宗教實有不足，其教誨與道德拉不上關係。它其實是一種討價還價，人們只要供奉，相信諸神不論是非曲直均會提供回報。

命運驅使馬可即位，其時來自東方及西方的外族已開始

and slept on the ground until his mother convinced him to sleep on a bed.

To a thoughtful mind the Roman religion at the time would give little satisfaction. Its teaching had little to do with morality. It was in fact a bargain: men paid their dues, and the gods granted their favour, irrespective of right or wrong.

By irony of fate Marcus was set at the head of the Roman Empire when great dangers threatened from east and west. His wars were largely successful, so was

入侵疆土及行省。他連場征戰及隨後的協議，總算為帝國換來了兩百年的安寧。

馬可被認為斯多葛學派中一個代表人物。斯多葛學派認為人應該順應自然。自然可解作大自然或人的美德。要達到此目的，斯多葛學派採取三條路徑：物理〔註〕、邏輯及倫理 。物理涉及宇宙法則、神權政府和目的論的問題。邏輯可鍛練心智，明辨是非。而倫理運用既得知識，實踐於現實生活。

《沉思錄》是在馬可最後十年寫成，期間大部分是鞍馬勞頓中進行。它是寫給自己的，未想過出版讓後人閱讀。它記錄內心的思潮，透過不斷的道德反省來開解公職的重擔和夙興夜寐的工作。我推薦你讀它，二千年的睿智現在讀來仍歷久常新，其中一小部分抄錄與大家分享（標題是本文加上的）。

the subsequent settlement, giving the Empire two centuries of respite.

Marcus was considered one of the most important Stoic philosophers. The philosophy seeks to live in conformity with nature, which can mean 'Nature' or a person's own virtues. To achieve this, there is a threefold division into: 'Physics[Note]', which deals with the universe and its laws, the problems of divine government and teleology; 'Logic', which trains the mind to discern true from false; and 'Ethics', which applies the knowledge thus gained and tested to practical life.

"Meditations" was written during Marcus' last ten years during most of which he was on campaign. It was addressed to himself, and he did not contemplate its publication for posterity. It records his inmost thoughts, with moral reflections as may help him to bear the burden of duty and the countless annoyances of a busy life. Read it, and the wisdom and rationality two millennia ago stays fresh and relevant. Some is shared below (the titles are mine).

**人在宇宙的角色**

*『你現在終於必須領悟你只是宇宙其中一部分，領悟你的存在只是其中一段流逝的宇宙的管理者，你只有有限的時間，如果你不用這段時間來清除你靈感上的陰霾；它就將逝去，你亦將逝去，並永不復返。』*

**關於死亡**

*『……注意什麼是死亡這一事實：如果一個人觀察死亡本身，通過反省的抽象力把所有有關死亡的想像分解為各個部分，他就將把死亡視為不過是自然的一種運轉；如果有什麼人害怕自然的運轉，那他只是個稚氣未脫的孩子。無論如何，死亡不僅是自然的一種運轉，也是一件有利於自然目的的事情。』*

**過去、現在與未來**

*『……雖然那已逝去的並不相同，但現在對於所有人都是同樣的。所以那喪失的看來就只*

**On our part in the universe**

*"It is high time for thee to understand the true nature both of the world, whereof thou art a part; and of that Lord and Governor of the world, from whom, as a channel from the spring, thou thyself didst flow; and that there is but a certain limit of time appointed unto thee, which if thou shalt not make use of to calm and allay the many distempers of thy soul, it will pass away and thou with it, and never after return."*



**On death**

*"... as what it is to die, and how if a man shall consider this by itself alone, to die, and separate from it in his mind all those things which with it usually represent themselves unto us, he can conceive of it no otherwise, than as of a work of nature, and he that fears any work of nature, is a very child. Now death, it is not only a work of nature, but also conducing to nature."*

**On past, present and future**

*"... yet that time which is now present and in being, is equal unto all men. And that being it which we part with whensoever we die, it doth manifestly appear, that it can be but a moment of time, that we then*



*是一單純的片刻。因為一個人不可能喪失過去或未來－一個人沒有的東西，有什麼人能從他奪走呢？』*

*『不要讓將來的事困擾你，因為如果那是必然要發生的話，你將帶着你現在對待當前事物的同樣理性走向它們。』*

**孰好孰惡**

*『使好事和壞事竟然不加區別地降臨善人和惡人身上。但肯定，死生、榮辱、苦樂所有這些事情都同樣地發生於善人和惡人，它們並不使我們變好變壞。所以，這些事物非善亦非惡。』*

**物質與靈魂**

*『事物本身不接觸靈魂，甚至在最低程度上也不；它們也沒有容納靈魂之處，不能扭轉或推動靈魂，靈魂僅僅轉向和推動自身，做出一切它認為適合的判斷，這些判斷是它為自己*

*part with. For as for that which is either past or to come, a man cannot be said properly to part with it. For how should a man part with that which he hath not?"*

*"Let not things future trouble thee. For if necessity so require that they come to pass, thou shalt (whensoever that is) be provided for them with the same reason, by which whatsoever is now present, is made both tolerable and acceptable unto thee."*

**On what's good and what's evil**

*"As for life therefore, and death, honour and dishonour, labour and pleasure, riches and poverty, all these things happen unto men indeed, both good and bad, equally; but as things which of themselves are neither good nor bad; because of themselves, neither shameful nor praiseworthy."*

**On material and soul**

*"As for the things themselves, they touch not the soul, neither can they have any access unto it: neither can they of themselves any ways either affect it, or move it. For she (the soul) herself alone can affect and move herself, and according as the dogmata and opinions*

*做出的對呈現於它的事物的判斷。』*

**有關顯赫名聲**

*『我常常覺得這是多麼奇怪啊：每個人愛自己都超過愛所有其他人，但他重視別人關於他自己的意見，卻更甚於重視自己關於自己的意見。』*

*『人們的行為是多麼奇怪啊：他們不讚那些與自己同時代，與自己一起生活的人，而又把使自己被後代讚揚，被那些他們從未見過或永不會見到的人的讚揚看得很重。而這就像你竟然因為生活在你前面的人沒有讚揚你而感到一樣可笑之至。』*

**對生命的頌讚**

*『熱愛那僅僅發生於你的事情，僅僅為你紡的命運之線，因為，有什麼比這更適合於你呢？』*

*『道德品格的完美在於，把每*

*are, which she doth vouchsafe herself, so are those things which, as accessories, have any co-existence with her."*

**On fame**

*"I have often wondered how it should come to pass, that every man loving himself best, should more regard other men's opinions concerning himself, than his own."*

*"Who can choose but wonder at them? They will not speak well of them that are at the same time with them, and live with them; yet they themselves are very ambitious, that they that shall follow, whom they have never seen, nor shall ever see, should speak well of them. As if a man should grieve that he hath not been commended by them, that lived before him."*

**On love of life**

*"Love and affect that only, whatsoever it be that happeneth, and is by the fates appointed unto thee. For what can be more reasonable?"*

*"Then hath a man attained to the estate of perfection in his life and conversation, when he so spends every day, as if it were his last day: never hot and vehement in*



*一天都作為最後一天度過，既不對刺激做出猛烈的反應，也不麻木不仁或者表現虛偽。』*

李本瀅

2010年11月5日

*his affections, nor yet so cold and stupid as one that had no sense; and free from all manner of dissimulation."*

LEE Boon-ying

5 November 2010

註：當時的物理與現今物理學有所不同。它視宇宙為一個有秩序、完善的整體，由元素組成，並趨向一個目的。人則是宇宙體系的一部分，可以說是一個小宇宙，本性與萬有的本性同一，以求達到至善。為此，他必須讓自己的靈魂清醒，讓理性統率自己。

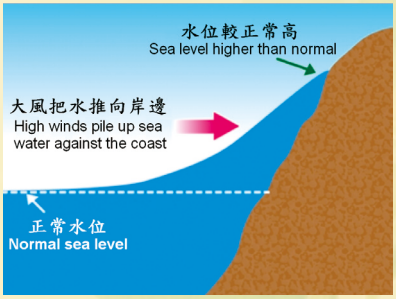
Note : 'Physics' at the time was quite different from what we have today. It considered the universe as perfect, orderly and purposeful, and made up of the elements. Man was considered part of the universe, or a small universe, with his nature and the universe as one, and should seek utmost perfection. For this he had to be clear in his mind and let reason govern it.

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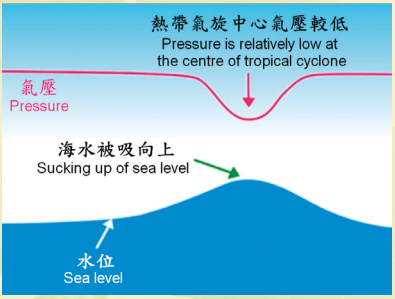
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# 什麼是風暴潮？

## What is a storm surge?




圖一：風暴本身的風力引致的水位上升
Figure 1 : Rise of sea water due to the storm's strong winds




圖二： 風暴的低氣壓造成的水位上升
Figure 2 : Rise of sea water due to the storm's low pressure

當強颱風鮎魚上月接近香港時，有人擔憂它會否帶來風暴潮。

簡單來說，風暴潮是熱帶氣旋引致的海水上升。熱帶氣旋的風力（圖一）是水位上升的主因，它的低氣壓（圖二）是次因。

Last month, as Severe Typhoon Megi approached Hong Kong, there was fear about the storm surge it might bring.

Simply put, a storm surge is a raised sea brought by tropical cyclones. The winds of a tropical cyclone (Figure 1) are the main culprit in water level rise, while its low pressure (Figure 2) contributes to a lesser extent.

過去一百年左右，曾有兩次風暴潮造成嚴重傷亡，一次在1906年，另一次在1937年，分別造成15,000人和11,000人死亡。

風暴潮的水位高度視乎水深和海岸線形狀而定。若風暴潮遇上天文大潮，後果會較為嚴重。

由於香港的地理位置，吹東風或南風時香港較易受風暴潮影響。這從我們知道熱帶氣旋的風總是向逆時針方向吹，便可以想像得到。

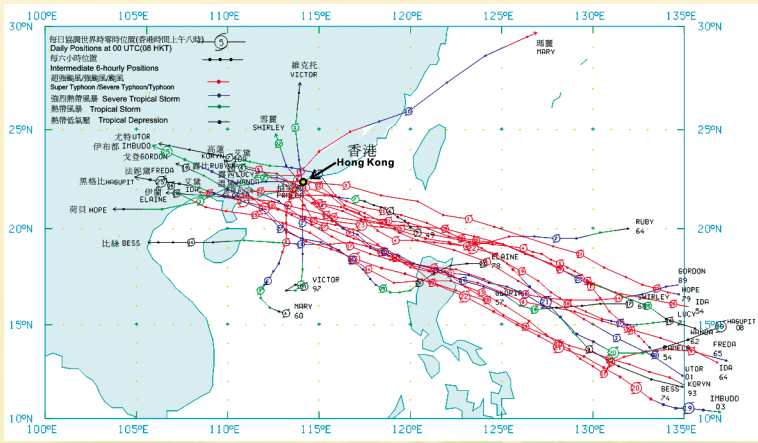
看看圖三，這幅圖根據現存數據，顯示導致香港出現最高20次風暴潮的熱帶氣旋路徑。紀錄保持者是1979年的颱風荷貝，那次在新界東的大埔滘水位上升了3.2米。總的來說，圖中的熱帶氣旋路徑，要不是直接或幾乎襲港，便是在香港西方或南方掠過。

Over the past hundred years or so, there have been two big killers, one in 1906 and the other in 1937, causing a heavy toll of 15,000 and 11,000 respectively.

The height of water brought by a storm surge depends on the water depth (i.e. bathymetry) and the shape of the coastline. It could be made worse if the arrival of the surge comes with the astronomical high tide.

The geography of Hong Kong suggests that it is vulnerable to storm surges when winds come from the east or south. This could be visualized if we bear in mind that a tropical cyclone's winds blow in a counter-clockwise direction.

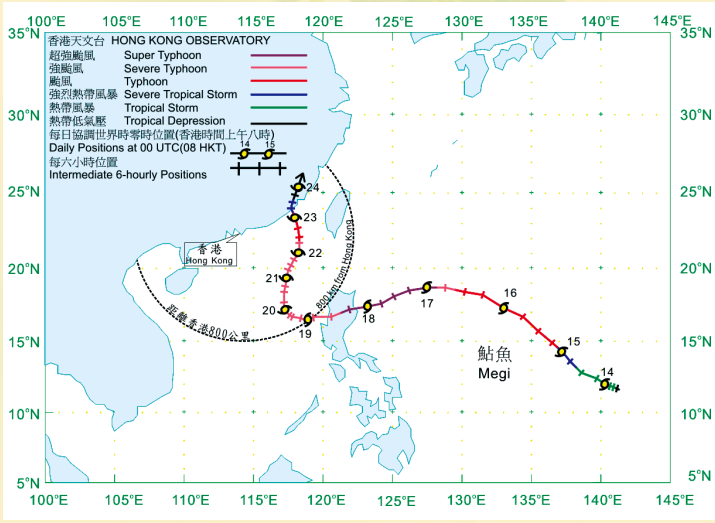
Have a look at Figure 3, which shows the tracks of the past 20 tropical cyclones that brought the most significant storm surges to Hong Kong, based on available data. The record holder was Typhoon Hope in 1979, which raised the water by 3.2 metres at Tai Po Kau in eastern New Territories. Overall, the tracks indicated that either the storms hit Hong Kong directly or almost, or they swept past Hong Kong from the west or south.




圖三：導致維港出現最高20次風暴潮的熱帶氣旋路徑

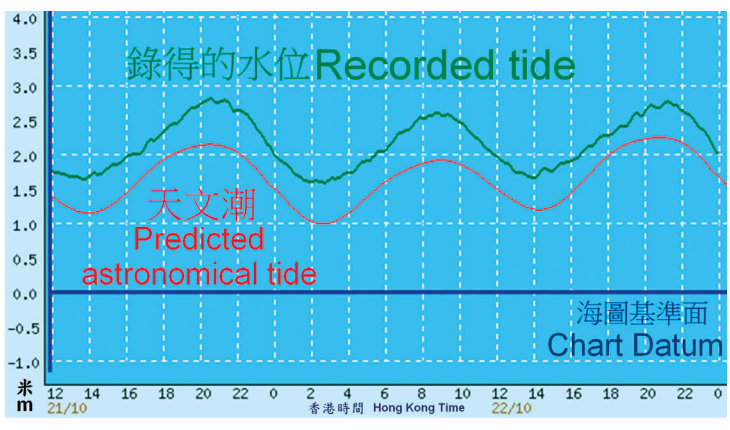
Figure 3 : Tracks of tropical cyclones leading to the 20 highest storm surges in Victoria Harbour






圖四：強颱風鮸魚的路徑

Figure 4 : Track of Severe Typhoon Megi




圖五：10月21日（星期四）正午至10月22日（星期五）午夜鰂魚涌的水位
Figure 5 : Sea level at Quarry Bay from noon on Oct 21 (Thursday) to midnight on Oct 22 (Friday)

比較上述路徑，可見鮎魚的路徑（圖四）頗為不同。鮎魚一直與香港維持400公里的距離，期間港內水位僅上升了0.7米（圖五），當中有0.5米是與東北季候風有關。換言之，鮎魚的風暴潮實際只有0.2米。

說起來，過去東北季候風亦曾造成輕微水浸。在冬天，強烈東北季候風加上天文大潮會將水位推高，曾令港島西區上環的低窪地區出現水浸。基

In comparison, Megi's track (Figure 4) was quite different. As it maintained a distance of 400 kilometres from Hong Kong during its passage, the water rose only 0.7 metre locally (Figure 5), of which 0.5 metre was associated with the northeast monsoon prevailing at the time. Thus Megi's storm surge was just 0.2 metre.

As a matter of fact, the northeast monsoon had caused minor flooding in the past. The low-lying areas at Sheung Wan in western Hong Kong were once vulnerable spots when in winter time, the strong northeast monsoon combined with a

礎建設改善後，這個問題基本消失。

由於風暴潮可以造成嚴重破壞，香港天文台於70年代曾進行計算和推演，以減輕風暴潮對新市鎮的威脅。為此，位於新界東的沙田等地區在填海時便額外填高了3米。

在天氣預測中，每當有熱帶氣旋移近華南沿岸時，天文台會運行一個風暴潮模式，若發現有威脅的話，會預先提醒市民特別注意風暴潮的危險。

李本瀅，胡宏俊

2010年11月12日

high tide pushed the water up. The problem has largely disappeared after improvement in the infrastructure.

Because of the havoc wreaked by storm surges, the Observatory made calculations and projections in the 1970s to mitigate the possible damage to new town developments. For this reason, places like Shatin in northeast New Territories had been reclaimed an additional 3 metres.

In weather forecasting, the Observatory runs a storm surge model every time a tropical cyclone approaches the south China coast and alerts the public to the danger of storm surge if any.

LEE Boon-ying, WOO Wang-chun

12 November 2010


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# 藤原效應
# Fujiwhara effect

當兩股熱帶氣旋互相靠近時，衛星圖上我們可以看到它們都以反時針方向彼此旋轉。這種現象被稱為藤原效應，是根據藤原咲平博士（Sakuhei Fujiwhara，1884至1950年）的名字命名。他在1921年的一篇著作中分析了水中旋渦的運動。他於1941年出任日本氣象廳廳長。

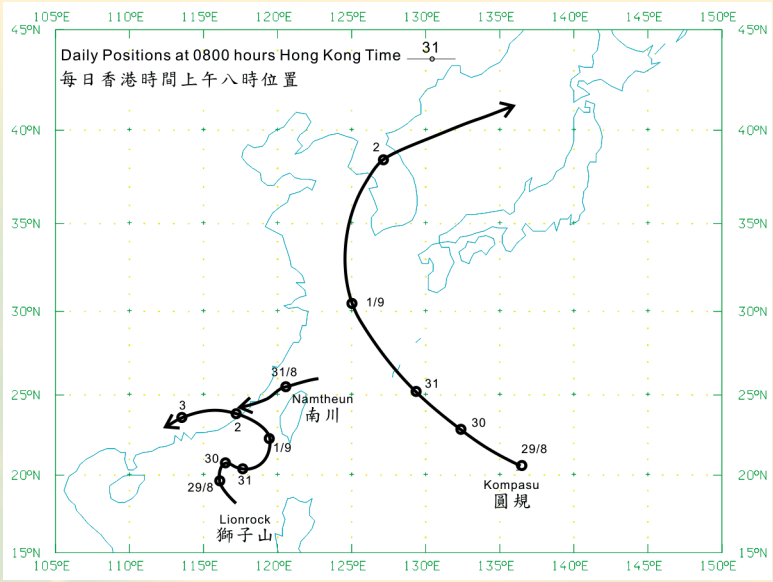
當兩個風暴相互靠近，距離約1,000公里時，藤原效應便變得明顯，兩股風暴會依據它們之間的一點而旋轉。一般來說，範圍較大的風暴往往主導這一個互動，較小的風暴會圍繞着它移動，有時甚至被它吞噬。

亞太區域出現藤原效應的例子不少。最近的案例是於8月下旬及9月初，涉及不只兩股風暴，而是獅子山、圓規及南川三

When tropical cyclones come near each other, we often can observe on satellite pictures that they rotate against each other in a counter-clockwise direction. The phenomenon is known as the Fujiwhara effect, named after Dr. Sakuhei Fujiwhara (1884 to 1950) who described it in a 1921 paper about the motion of vortices in water. He later became the director of the Japan Meteorological Agency in 1941.

The effect is evident when the two storms come within about 1,000 kilometres of each other. They tend to rotate about a point between them. Normally, the larger storm tends to dominate the interaction, and the smaller one will orbit around it and sometimes become swallowed up by it.

Examples of the Fujiwhara effect are abundant in this part of the world. The recent case in late August and early September is an interesting one involving not two, but three storms, namely Lionrock, Kompasu and Namtheun (Figure 1).




圖一：2010年8月下旬至9月初三個熱帶氣旋，獅子山、圓規及南川的路徑圖。

Figure 1 : Tracks of three tropical cyclones, Lionrock, Kompasu and Namtheun during late August to early September, 2010



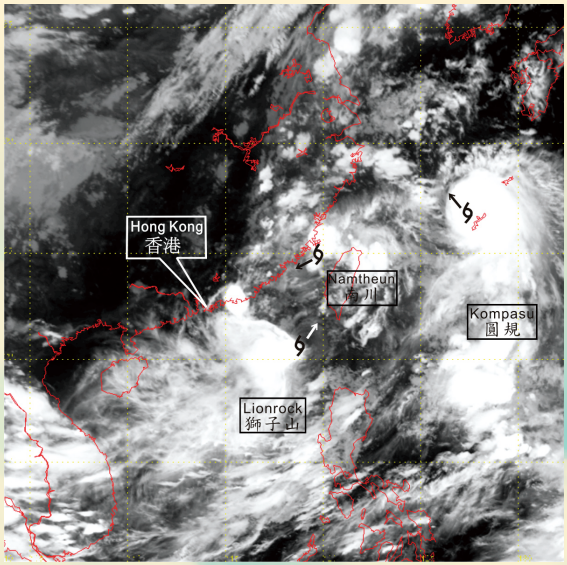
股風暴的有趣例子（圖一）。

獅子山於8月28日於香港東南偏南的南海上形成，並向西北移動。不久，圓規於翌日在沖繩島東南的北太平洋西部上形成。圓規向西北迅速移動，而獅子山則開始向東移動。

與此同時，南川於8月30日在台北之東北形成，位於這兩

Lionrock formed over the South China Sea to the south-southeast of Hong Kong on 28 August, moving northwestwards. This was followed by Kompasu, which formed over the western North Pacific to the southeast of Okinawa the next day. Kompasu then sped towards the northwest, while Lionrock started to move eastward.

Meantime, Namtheun formed northeast of Taibei on 30 August, between the two storms. It was short-lived, moving




圖二：2010年8月31日晚上8時的紅外衛星圖像，顯示了三個熱帶氣旋，獅子山、南川和圓規。（此圖像接收自日本氣象廳的多用途輸送衛星-2（MTSAT-2）。）

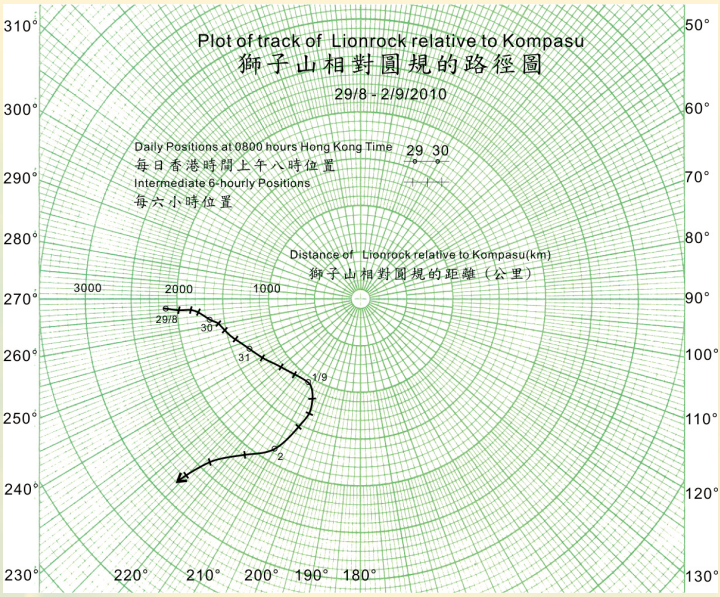
Figure 2 : Infrared satellite image showing the three tropical cyclones, Lionrock, Namtheun and Kompasu at 8 p.m. on 31 August 2010. (The satellite imagery was originally captured by Multi-functional Transport Satellite-2 (MTSAT-2) of Japan Meteorological Agency (JMA).]

股風暴之間。南川的壽命頗為短暫，它在隨後一兩天向西南方向移動，在9月1日終被獅子山併吞進其環流內。

在衛星圖像上（圖二），圓規的範圍最大，並似乎支配着與獅子山及南川的互動。圖三顯示獅子山相對圓規（即圓規在圖的中心不動）的移動狀況。圖中顯示，在9月1日以前，獅子山實際上以大致逆時

southwestward over the next day or so, before being absorbed into the circulation of Lionrock on 1 September.

On the satellite image (Figure 2), Kompasu had the largest size and appeared to dominate the interaction with the other two storms, Lionrock and Namtheun. A plot of Lionrock's movement relative to Kompasu (i.e. with Kompasu held stationary at the centre) is given in Figure 3, which shows that, before 1 September, Lionrock indeed moved generally counter-clockwise relative to Kompasu as the two




圖三：獅子山相對圓規的路徑圖

Figure 3 : Plot of track of Lionrock relative to Kompasu

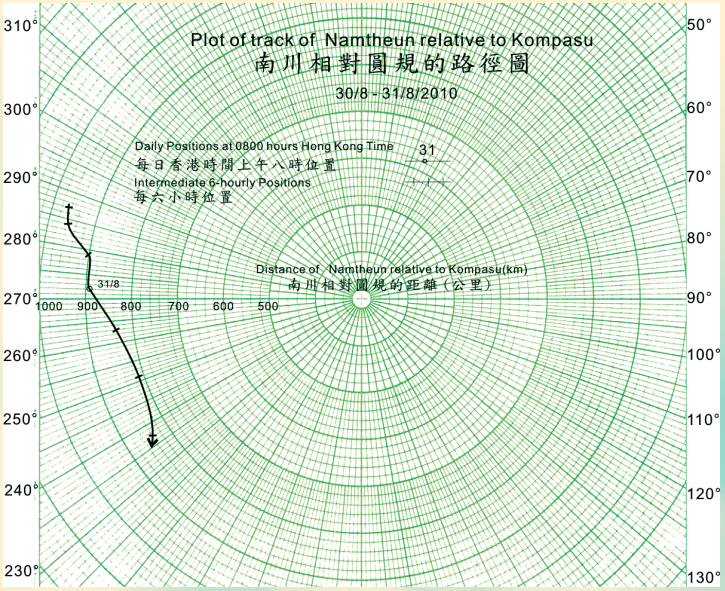
針的方向相對着圓規移動，兩股風暴逐漸靠攏，直至當距離減至稍為超過1,000公里那刻。在這一點後，受背景引導氣流驅使，兩股風暴開始移離對方。

同樣的逆時針運動可以在南川相對圓規的移動觀察到，正如圖四所示。南川與獅子山亦出現類似的相互運動，但並不明顯（圖略）。

moved closer to each other to within a separation of slightly over 1,000 km or so. After this, the two started to move away from each other under the influence of background steering flow.

The same counter-clockwise movement can be observed on Namtheun's movement relative to Kompasu, as evident in Figure 4. Namtheun also exhibited a similar, but no so clear-cut, movement relative to Lionrock (not shown).

The interaction of three storms is complex and still poses a challenge to




圖四：南川相對圓規的路徑圖

Figure 4 : Plot of track of Namtheun relative to Kompasu

三股風暴的相互作用是複雜的，採用數值天氣預報模式準確地預報風暴的未來路徑仍然有一定困難。

我們知道，在南半球，熱帶氣旋本身流動風向與在北半球的方向相反。那麼當兩股風暴在南半球相互旋轉時，方向是順時針抑或逆時針？

李本瀅，呂永康

2010年11月19日

numerical weather prediction models in accurately forecasting their future movement.

We know that in the Southern Hemisphere, winds around a tropical cyclone flow in a direction opposite to those in the Northern Hemisphere. Could you figure out which direction would two storms in the Southern Hemisphere rotate against each other - clockwise or counter-clockwise?

LEE Boon-ying, LUI Wing-hong

19 November 2010

# 熱夜
# Warm nights

許多市民問香港天氣是否越來越熱。答案當然是「正確」，但實際情況跟我們一般理解有所不同。

由於香港高度城市化，一些熱能特別是來自太陽的熱力會被大廈、馬路及其他建築物吸收，令市區的日間溫度通常較新界地區為低。相信大家都知道由於位於九龍市中心，天文台的日間溫度通常都是較新界地區（例如打鼓嶺）低一兩度（圖一）。

晚間時分，情況剛好逆轉。建築物及基建將日間儲存的熱能釋放，令晚間城市溫度高於郊區。

早前本港舉行了全城無冷氣日。我找同事幫忙，計算了戰後到現在60年間天文台錄得「熱夜」的變化。熱夜是指

People often ask whether the weather in Hong Kong is getting hotter and hotter. Well, it is. But not in the sense that we normally associate hot weather with.

The high degree of urbanization in Hong Kong means that during the day, some of the heat particularly that from the Sun becomes absorbed by buildings, roads and other structures. The result is that daytime temperatures in the city are normally lower than those in rural areas. For instance, day time the temperatures at the Hong Kong Observatory (in the city centre in Kowloon) are often a couple of degrees lower than that at the New Territories, e.g. Ta Kwu Ling.

At night, the situation is reversed. The heat stored in buildings etc. is released back to the air. This makes the nighttime temperature in the city higher than that in rural areas.

Recently there was a 'No air-conditioning day' campaign in Hong Kong. I asked my colleague to compute the number of 'warm nights' at the Observatory

當天低溫達到28℃或以上的晚上。結果請參考圖二。

圖二清楚指出，50年代平均的熱夜數目基本上寥寥可數，但到本世紀第一個十年已升至每年超過20天。

談到熱夜，打鼓嶺的情況完全不同。該處至今仍可算是郊區。除2004年僅得一天外，過去十年沒有出現熱夜，風扇足可令人感到涼快。這角度看，是一個氣候宜人的地方。

那麼，未來十年城市的情況會變得怎樣？我們將未來可能發生的排放情況（由現有生活模式完全不變至到全力減排）引致的溫度轉變匯集後，得出的平均數字是：到2020年，熱夜數目會超過兩倍，達到每年55天。而日間溫度達到33℃以上的日子，也會由每年13天倍增至27天。

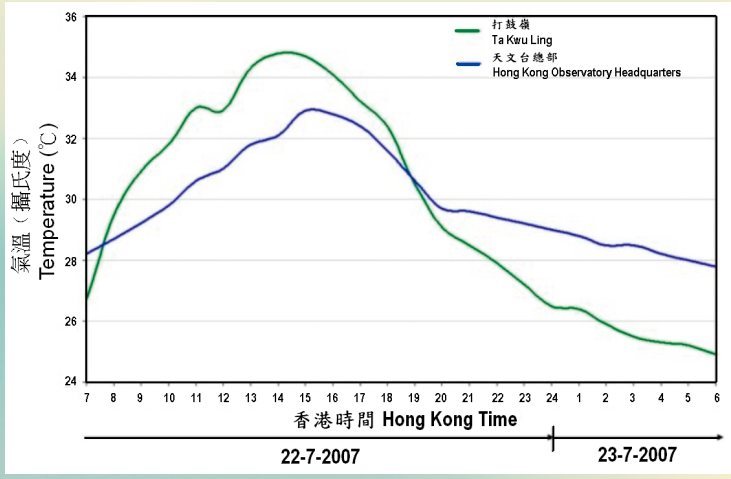
在愈趨炎熱的天氣下，如果我們不改變生活的模式，社

for the past 60 years, i.e. after the Second World War. A warm night means that the minimum temperature that night reaches 28°C or above. The results are presented in Figure 2.

The diagram tells us that, on average, the number of warm nights has increased from practically none during the 1950s to more than 20 by the end of the 2000s.

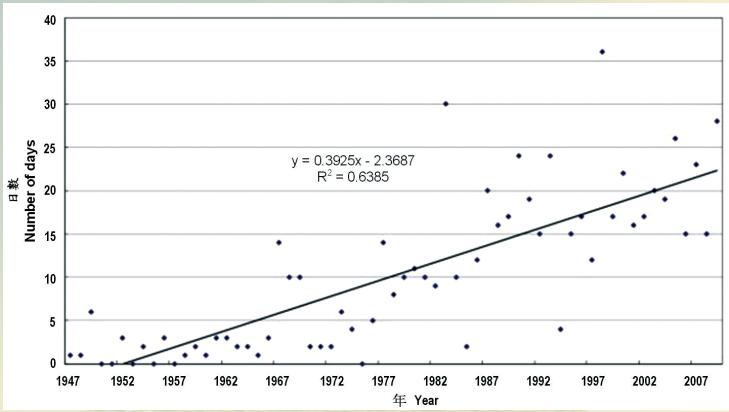
In terms of warm nights, the situation at Ta Kwu Ling is entirely different. The station there is located in an area which remains largely rural to this day. There was no warm night over the past 10 years from 2000 to 2009, except for 2004 which had only one warm night. On this account, therefore, Ta Kwu Ling is quite a habitable place. A fan is probably all it takes for cooling during nighttime.

What is going to happen in the city in 10 years' time? Our computations based on an average of possible emission scenarios (ranging from 'business as usual' to aggressive 'do what we can') tell us that by 2020, the number of warm nights will more than double, to 55 per year. The number of hot days, that is, those days with daytime temperatures reaching 33°C or above, will also double from 13 to 27 per year.




圖一：香港市區及郊區夏天溫度的典型變化

Figure 1 : Temperature difference between city and countryside in a typical summer day in Hong Kong




圖二：香港天文台1947至2009年熱夜的數目

Figure 2 : Number of warm nights at the Hong Kong Observatory, 1947-2009

會便會消耗更多的化石能源。更多二氧化碳會排放到大氣，從而令地球進一步增溫，惡性循環愈演愈烈。

李本瀅
2010年11月26日

Hotter weather means that, without a fundamental change in our lifestyle, more fossil-based energy will be used for cooling. This inevitably will exacerbate the release of carbon dioxide, the major greenhouse gas, into the air. This in turn will bring further warming, feeding a vicious circle.

LEE Boon-ying
26 November 2010

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# 一顆冬天的心
# A heart in winter

2010年11月5日的網誌談及古希臘時代斯多葛派思想。斯多葛徒人受蘇格拉底道德觀深遠的影響，傾向抑制所有情感。

這種抑制是好是壞？現今還有沒有斯多葛思想追隨者？我們可以從一部電影看出端倪。

1992年電影《今生情未了》，講述一個三人故事：斯特方（斯）、卡妙兒（卡）、麥盛文（麥）。卡是小提琴明日之星，和麥開始一段戀情。麥是一間小提琴的工作室老闆，聘斯為技師。麥與斯性情大異其趣，麥在舖前掌理所有商業瓜葛，斯則在後台潛心製琴，堪稱大師。

斯樸素淡薄，追求內在生活，難於表達情緒。他工作專業，極好音樂，對顧客的表演

The blog of 5 November 2010 talked about Stoic thoughts, which date back to ancient Greek times. Heavily influenced by Socrates' ethics before them, the Stoics aspired to the repression of all emotion.

Is such repression any good? Are there any more Stoics nowadays? Well, at least we have an example in a movie.

The 1992 movie, “A heart in winter (Un coeur en hiver)”, tells the story of three characters: Stephane, Camille and Maxime. Camille, a violinist of rising fame, began a relationship with Maxime, who runs a workshop making and repairing violins and hires his friend Stephane. Maxime and Stephane are polar opposites. While Maxime on the front takes care of business dealings, Stephane at the back is a master craftsman of violins.

Stephane's lifestyle is minimal and spartan. He lives an inner life and is quite incapable of expressing any emotion. He excels at his work and loves music, understanding his clients' performances well. While his eyes are radiant, he puts his feelings into a place beyond the reach of

瞭如指掌。他的目光炯然有神，但感情卻藏在深處，難以觸摸。

卡表面冷漠，拒人千里。但內裡熾熱的心，透過她奏出的音樂表露無遺。

也就是，一天她與麥午飯後，對斯驚鴻的一瞥，改變了三人的命途。她深深受到斯的木納難以言喻所吸引。一次，斯剛修好她的琴，到場聆聽練習，她心如鹿撞，不斷將一段樂譜奏錯。又一次，演練中途他唐突地邀請她出外蹓躂，她欣然接受，他們在外面迎來大雨，過路時還差點給車碰倒。

隨後是一段沉寂，他似在迴避，而她也沒有作主動。只是到麥快要與卡一起搬進寓所時，斯感到不舒服，開始檢拾對卡的感情。

後來，她來一次攤牌，指摘他逃避。斯承認自己麻木不仁，責無旁貸。她並不接受。

most people.

On the surface, Camille displays coolness that keeps a distance between herself and others. But underneath, especially in her music, she has a real passion.

It is a passing glance from Camille, after having lunch with Maxime one day, that proves fateful. She is attracted to the reticent and mysterious Stephane. In a subsequent rehearsal in front of Stephane (who has just fixed her violin), she keeps getting a certain passage wrong. In another rehearsal, he unexpectedly invites her for a drink - a rather rude interruption for her and her colleagues. But she accepts it, and they go out in the midst of a downpour, almost run over by a car.

Then there is a period of inactivity when Stephane seems to avoid her. Camille has stopped calling him. It is when Maxime is about to move into an apartment with Camille that Stephane suddenly feels uncomfortable. He starts to look back at their relationship.

In a showdown, she reproaches him for avoiding her. He indicates that it is his choice to live without emotion and feeling. But she is not convinced.

麥此時明白了他兩人的事，君子地退出以成全他倆。在演奏室中卡大放異彩，表演極其成功，打算同斯慶祝一番。此時斯變得不自在，明確表示一切對他來說已經太遲，不能與她有親密關係。好一個晴天霹靂，卡肝腸寸斷。

恢復過來後，卡回到麥的懷抱。斯開始感到，他與麥和卡的感情實在比他想像為深。當麥陪同卡出國演奏時，她向斯回望，眼裡流露熾熱情懷，跟初次邂逅時並無二致。

電影絕不是一段好萊塢式浪漫之戀。斯可以說是斯多葛門徒。他對音樂和藝術的執着，為他帶來內心平和，達到善境。

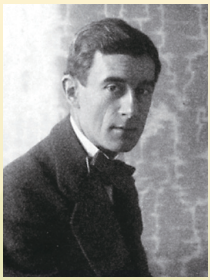
身為斯多葛門人，羅馬君主馬可．奧勒留說過：*「被激情推動是缺乏男子氣概的，而和善寬厚由於是人性更欣悅的，他們卻更有男子氣概，那擁有這些品質的人也擁有力量、精*

Maxime then realizes what has happened and gentlemanly decides to withdraw and leave them alone. Camille, having performed superbly at the studio, happily dashes off with Stephane for a celebration. Then Stephane becomes uneasy, and makes it very clear that he is unable to have the intimate relationship with her, saying that he is too late for everything in life. Camille is shattered.

When Camille recovers, she returns to Maxime's side. It dawns on Stephane that there is more to his feelings for Maxime and Camille than he admits. As Maxime and Camille depart for a concert tour, Camille looks back at him with the same intensity she cast upon him the first time.

The movie is not intended to be a Hollywood romance. In a way, Stephane is a believer of Stoicism. His concentration on music and arts brings inner peace and a higher level of perfection.

Marcus Aurelius (121 to 180), a Stoic philosopher and Roman emperor, said: *"In thy passions, take it presently to thy consideration, that to be angry is not the part of a man, but that to be meek and gentle, as it savours of more humanity, so of more manhood. That in this, there*



拉威爾，1912（圖片來源：維基百科）
Maurice Ravel, 1912 (Image source : Wikipedia)

*力和勇敢，而受制於激情和不滿的發怒者卻不擁有這些。」*

電影中眾人的關係，可能錯綜複雜，然而奉上的拉威爾的室樂，實是一場場的盛宴，不會令人失望。總之，冬天自有其美態。

李本瀅
2010年12月3日

*is strength and nerves, or vigour and fortitude: whereof anger and indignation is altogether void."*

While the inter-relationships in the movie may be complicated, the viewer is nevertheless awarded with a sumptuous feast of Ravel's chamber music. Music lovers would not be disappointed. Winter has its own beauty.

LEE Boon-ying
3 December 2010

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# 天文台的天氣預報有多準確？

## How accurate is our weather forecast?

審計署最近一份報告指出，市民認為天氣預報的準確度與天文台所定的評分有所差距。簡單地說，是市民認為大概百分之七十五至八十的天氣預報屬於準確，而天文台的評估則達到百分之九十。為何會有這樣的差距？究竟哪一個評估才是對的？

自1989年起，天文台每年會委託獨立公司進行兩次的公眾意見調查，以評估市民認為天氣預報的準確度。多年來分析結果的經驗，顯示市民的印象主要是基於我們預測顯著天氣轉變的表現，例如熱帶氣旋襲港或寒潮到來的影響。當天文台能夠準確預測天氣轉變時，市民便會給予較高的分數，反之則會給予較低分。這完全可以理解，因為要市民回

A recent Audit report states that the forecast accuracy as assessed by the public is different from that by the Observatory. In gist, the public considers that the Observatory's forecast is accurate around 75% to 80% of the time, while the Observatory's self evaluation puts it at about 90%. Why is that? Which one is true?

Public assessment of forecast accuracy is obtained from twice yearly surveys conducted by an independent company. Such surveys have been carried out since 1989. Years of experience looking at the survey results tells us that the public base their impression mostly on our performance in forecasting significant changes in the weather, such as a typhoon passage or the arrival of cold weather. They tend to give a higher mark if the change is well anticipated or a lower mark if otherwise. This is fully understandable as it is next to impossible asking somebody to recollect how the Observatory performs during a series of days when the weather hardly changes.

憶天文台在天氣無特別變化的日子時的表現，幾乎是不可能的。

另一方面，天文台驗證預報時，是應用一套客觀的方案，以評估天氣預報的準確程度。基本上，天文台會就五項天氣要素，包括溫度、降雨量、風速、雲量及能見度進行驗證。若該五項天氣要素佔同樣比重，則每項要素都佔二十分，那麼一個完全準確的預測便會是一百分。但實際上，若給予這五項天氣要素同樣的比重，並不合理。因為這些要素的重要性會隨著季節變更而有所不同，舉例說：夏季以降雨量，春季以能見度，而冬季或較涼的月份則以溫度較為重要。因此，在夏季若降雨預測準確，或冬季時溫度預測準確，預報都會得到較高的分數，如此類推。

On the other hand, at the Observatory we use an objective verification scheme to evaluate the accuracy of a weather forecast. In essence, 5 weather elements are evaluated: temperature, rainfall, wind strength, cloud cover and visibility. If these elements carry equal marks, then each of them carry 20 marks, contributing to a total of 100 marks if the forecast is perfect. However, in real life it would not be realistic to allocate equal marks to them, because their importance to daily life tends to vary with the seasons. For instance, the more important element for different times of the year would be: rain in summer, visibility in spring, and temperature in winter or the cooler months. Thus, a higher mark will be allotted to a correct rain forecast in summer, a correct temperature forecast in winter, so on and so forth.

This way, the weather forecast issued each day is evaluated. At this point you will immediately notice that while the public cares about weather changes, the Observatory's verification is carried out every day, irrespective. This is essentially where the difference between public perception and the Observatory's objective verification comes from. There

我們就是照這方法評估每日所發出的天氣預報。至此，你們會留意到一方面市民關心天氣的轉變，天文台則對全年的每一天的預測平等處理，一視同仁。這基本上就是兩種評分有所差距的原因。其實兩者之間並無任何衝突，因為他們着眼的地方是不同的。

天文台需要驗證每一天的預測，是因為預報員在作出每一次預測前都要分析所有相關的天氣資料。舉例說如果今日是晴天，預報員需要有充分的理由說服自己及天文台的同事，才可以預測明日仍是晴天。換言之，預報員必須科學地排除各種可能令天氣轉壞的因素，例如位於香港上游地區或正在影響鄰近地方的雲帶或雨帶。即是說，不論晴或雨，預報員每天都要經過同樣的分析過程。這方面的工作或許是市民未能立刻察覺到的。

is no conflict between the two as they are looking at different things.

The Observatory verifies its forecast each day for the very reason that the forecaster has to take into account all relevant weather information each time before issuing the forecast. For instance, if today is a fine day, before arriving at a forecast for yet another fine day tomorrow the forecaster has to convince himself and people at the Observatory that there are sound reasons for him/her to do so. In this instance, the forecast has to scientifically discount the various factors that may bring a cloudy or rainy day, including clouds that are lurking upstream or rain that is round the corner and is already affecting Hong Kong's neighbouring areas. In other words, the forecaster goes through the same processes each day come rain or shine. This is an aspect of the forecaster's work that the public may not be immediately aware of.

Another aspect that the public does not readily recognize is their ever increasing expectations about the weather forecast. It is widely accepted that the accuracy of weather forecast world-wide has slowly but consistently improved, thanks to the



天文台天氣預報中心
Observatory weather forecasting centre

另一件市民未必注意到的事情就是他們對天氣預報的期望在不斷提升。世界各地天氣預測的準確度得以穩步持續改善，實有賴氣象學家的苦幹和合作、新儀器的研發、以及高效能和價格合理的電腦的應用。有了這些改進，人們很自然要求更準確的天氣預測。結果就是市民的期望和天氣預報

work and co-operation of meteorologists, the emergence of new equipment, and the advent of powerful and affordable computers. With such improvement, it is only natural for people to expect the weather forecast to be better and better. The end result is that the gap between public expectations and the accuracy of weather forecast will remain.

We are looking into whether or not the discrepancy between public perception and objective evaluation of weather forecasts can be narrowed.

的準確度一直存在着一定差距。

我們會探討可否縮窄市民的觀感和客觀天氣預報驗證之間的差別。

天文台會不斷尋求進步。舉例說：我們的短期預報系統曾多次應用於重要的國際盛事上，包括 2008年的北京奧運會、2009年的東亞運動會、2010年的上海世界博覽會、廣州亞運會及新德里英聯邦運動會。我們會繼續努力不懈，不停改善。

李本瀅，龔穎恒
2010年12月17日

The Observatory will not stop its pursuit of continuous improvement. For instance, its short-term forecasting system has been featured many times in international arenas in support of important events, including the Beijing Olympics in 2008, the East Asian Games in 2009, as well as the Shanghai EXPO, the Asian Games in Guangzhou, and the Commonwealth Games in New Delhi, all in 2010. We will continue our effort at seeking perfection.

LEE Boon-ying, KUNG Wing-hang
17 December 2010



# 白夜
# White nights



年青時的杜思妥也夫斯基（圖片來源：維基百科）
The young Dostoyevsky, 1847 (Image Source : Wikipedia)

有一年6月到過聖彼德堡（北緯60度）。由於夏至時分太陽位於最北的位置，北半球高緯度的地方太陽很遲才下山，整晚可以看到曙光，沒有黑夜。

杜思妥也夫斯基（1821至1881年）的短篇小說「白夜」就是以此時此地為背景。小說

I was once in Saint Petersburg (60 degrees north) in June. There and then, the Sun did not set until fairly late in the evening and twilight lasted almost all night. This is because during summertime, the Sun is at its northernmost position (summer solstice), and there is no complete darkness in high latitude places in the Northern Hemisphere.

Dostoyevsky's (1821 to 1881) “White

於1848年作者仍年輕時寫成，早於其重要的小說如1864年的「死屋手記」和1866年的「罪與罰」等。

讀過這小說，你會明白為何它曾多次改編走上銀幕：俄羅斯、意大利、印度（3次）、法國、伊朗及美國。以下是故事主線。

**第一夜**

故事中的主人翁（我們就叫他伊凡）是寂寞的人，喜歡在城中獨來獨往。在一個日長夜短的夏夜裡，他留意到一位少女在飲泣。他想伸出同情之手，但內斂性格令他有所遲疑。然而當她受人滋擾而呼叫時，他不再猶疑，出手相救。少女的名字是娜絲坦卡。在隨後的談話中，他訴說因為害怕失望和被嘲笑，他從未結識過異性，不用說更未曾與異性傾談。到達少女家時，他懇求第二天晚上再見面，好讓他重溫

Nights" was a short story set against this period of the year. It was published in 1848 when the author was young, well before his major novels such as "Notes from Underground" (1864) and "Crime and Punishment" (1866).

Read the story, and you will appreciate why it has been adapted many times for the screen in various countries: Russia, Italy, India (3 times), France, Iran and the United States. Here is the storyline.

**First night**

In the story, the main character (let's call him Ivan) was a lonely person who loved walking in the city at night time. It was one of those summer evenings when he first saw a young girl crying. He was concerned but hesitated to ask as this was out of his character. Nonetheless, when he heard her scream he acted and saved her from being harassed. A conversation then started between them, in which he told Nastenka, the young girl, he had never known a woman let alone talking to one, for fear of disappointment or being ridiculed. On reaching the girl's home, he asked to see her again the next evening just

快樂時光。娜絲坦卡欣然答應，並承諾會將她自己的故事相告。

**第二夜**

第二天晚上，他們彼此認識多了。伊凡說由於自己孤獨生活，沒有甚麼值得談論。倒是大多時間都做夢，因為只有這樣才免於沉悶。娜絲坦卡訴說，她與祖母相依為命，須將屋子分租靠微薄收入賴以糊口。因此之故，一位年青的租客開始借書給她看，並帶她及祖母到歌劇院，隨而展開追求。當年青人離開遠赴莫斯科時，娜斯坦卡求他娶她，他由於身無一文而拒絕了。然而，他答應一年後會回來。到如今，一年已過卻書信全無。因此她鬱鬱不樂，悲從中來。

**第三夜**

娜絲坦卡知道年青人已回到城中。此刻，伊凡醒覺自己已墮入愛河，而這並不是柏拉

to relive the happy moment. She agreed, adding that she would be there anyway and would tell him her story.

**Second night**

On the second night, they knew more about each other. Ivan indicated that he had little to say about himself because he spent his life alone, dreaming all the time as this was the only way to relieve himself from boredom. Nastenka related that she stayed with her strict grandmother of limited means, who had to rent out their house for a living. There began a courtship when a young lodger started giving her books to read and taking her and her granny to opera. When the young man had to leave for Moscow, Nastenka asked him to marry her, but he refused because he had no money. He however promised her that he would return in a year's time. Now a year had passed and there was no letter from him. She was very upset.

**Third night**

Ivan discovered that he had fallen in love and that the love in her could never be platonic. He nonetheless helped her write a letter to the young man knowing that the

圖式的愛。儘管如是，他仍幫她寫了一封信。但年青人沒有回覆。她開始感到絕望，對伊凡說：「我愛你，因為你還沒有愛上我。」他開始忐忑不安，整個世界好像正離棄他。

**第四夜**

伊凡耐性地不停安慰，她覺得感激。此時，他按不住表達了對她的愛意。聽到後，她若有所失，不知所措。由於事到如今不可能繼續朋友般的情誼，他向她道別，堅持雙方不再見面。她央求他留下。蹓躂了一段，她說誰可料，說不定他們的交情有天會發展成戀愛，儘管她仍然渴求他終生的友情。他聽到後，神情為之一振。此時，年青人突然出現，她飛奔入懷，待回頭才給伊凡一個短吻。

**後話**

心靈破碎之餘，伊凡收到娜絲坦卡一封信。信中她求他

latter was in town. But there was no reply. She started to despair and said to Ivan "I love you so, because you have not fallen in love with me." He felt very uneasy. The world seemed to be drifting away from him.

**Fourth night**

Ivan continued to comfort her. She felt very grateful. At this, he confessed his love for her. On hearing this, she was temporarily lost. He insisted that they should never see each other again well knowing that it would no longer be possible for them to remain as friends. He was about to leave. She urged him to stay. As they walked she said who could tell their relationship might become romantic one day, but she desired his friendship for life. His spirit lifted somewhat, but at this point the young man suddenly appeared. She instantly fell for him, only returning to give Ivan a brief kiss.



**Afterword**

Heart broken, Ivan received a letter from Nastenka. In the letter she asked for his forgiveness and thanked him for his company, adding that she would be

原諒，並感謝他相助渡過艱難時期。她又說一周後會舉行婚禮，希望他到來。最後，他寫下：*「我的幾個夜晚終於在一個早上完結。大雨滂沱，不停往窗子無情的打，天氣實在可惡。」*

李本瀅

2010年12月24日

married in the week and hoped he could come. At the end he wrote: *"My nights came to an end with a morning. The weather was dreadful. It was pouring, and the rain kept beating dismally against my window panes."*

LEE Boon-ying

24 December 2010



參考資料：
維基百科

Reference :
Wikipedia

# 航機為何要轉飛？

## Why do planes have to divert?



飛機要轉飛的原因很多，其中一個是受天氣影響，如雷暴、熱帶氣旋及大霧等。在2010年9月，超過二十班飛機因天氣未能降落香港，需要轉飛其他機場。

其中兩宗因雷暴而要轉飛的個案發生在9月8日。當晚香港受大雷雨影響，一道雷雨帶橫過香港，在零時起的一小時內共錄得超過一萬次閃電。正好一班由上海來港的客機備降落在香港國際機場遇上強風，需要轉飛澳門。

究竟為什麼強風會令飛機轉飛？首先我們須考慮一些飛機操控的原理。

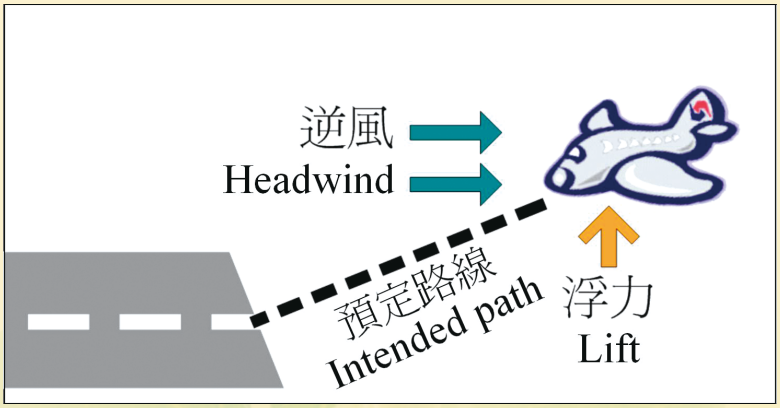
飛機在高空飛行時，附近的氣流是順風比逆風好，因為阻力減少，可省燃料之餘，速

There are many reasons why flights have to divert. One of them is weather, such as thunderstorm, tropical cyclone and fog. In September 2010, over twenty flights were unable to land in Hong Kong due to bad weather and had to divert to another airport.

Two flight diversions took place on 8 September because of thunderstorms. An intense rainband swept across Hong Kong that evening, bringing heavy rain and thunders. Over 10,000 lightning strokes were recorded during the hour after midnight. An aircraft from Shanghai to Hong Kong preparing to land at the airport encountered strong winds and had to divert to Macao.

Why did the aircraft have to divert under strong winds? Let's consider some basics about aircraft control first.

When an aircraft is cruising in the sky, it prefers a tailwind to a headwind because of smaller air resistance. Apart from saving fuel, the aircraft also moves faster. However, the reverse is true when it comes



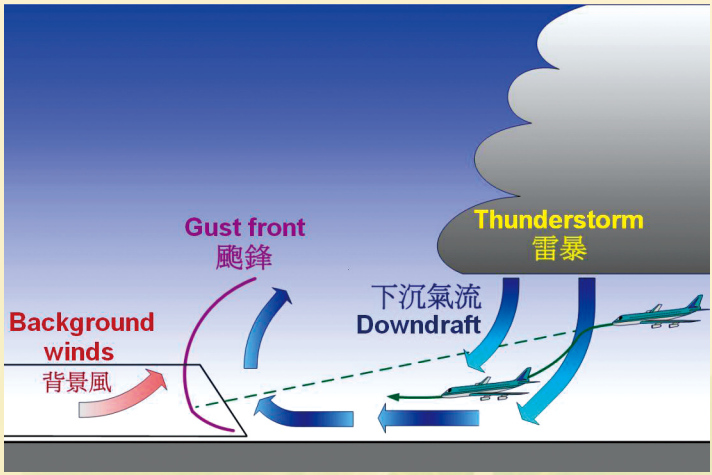

圖一：逆風與浮力的關係
Figure 1 : The relationship between headwind and lift

度也可提高。但在機場升降則不同，逆風比順風好。原因是逆風會產生浮力，令飛機抬升，較易操控（圖一）。順風則相反，令操控困難，會生意外。

強烈雷暴會帶來大雨和猛烈的下沉氣流。下沉的冷空氣在接觸到地面時會擴散，其前

to landing or taking off. Here a headwind is preferred because it produces a lift and the aircraft can be better controlled (Figure 1). A tailwind works the other way round: an aircraft is harder to control and an accident may occur.

Intense thunderstorms bring heavy rain and violent downdrafts. On hitting the ground the descending cool air spreads out. The leading edge of the cool air is called a gust front



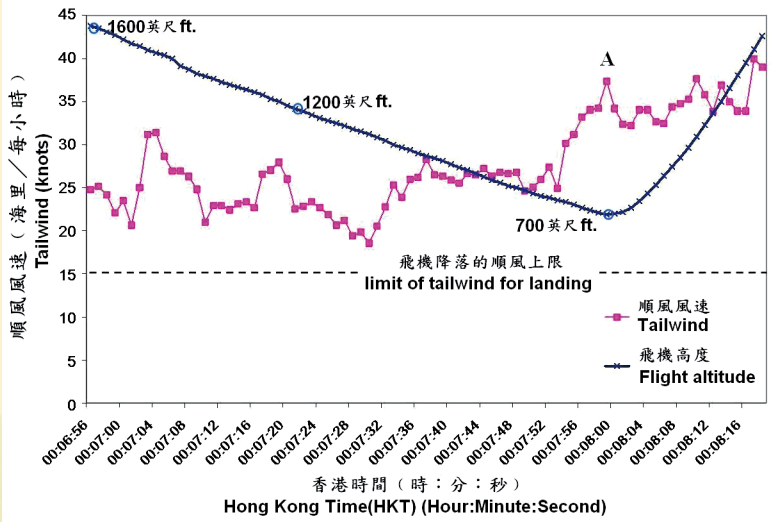

圖二：颮鋒的示意圖

Figure 2 : Schematic diagram of a gust front

端稱為颮鋒（圖二）。飛機在遇上由雷暴帶來向外擴散的氣流時，如與下沉氣流有關的順風，飛機的浮力會因而減少，不易操控。當順風或逆風變化超過每小時15海里時，我們稱之為風切變，飛行人員必須考慮是否需要轉飛其他機場，以確保安全。

(Figure 2). When the aircraft meets the outflow from a thunderstorm, such as the tailwind from the descending air, the lift decreases making the aircraft harder to control. A tailwind or headwind change of 15 knots or more is called a significant windshear. Under such circumstances, a pilot has to consider the need to divert to another airport to ensure safety.

The Observatory had already issued the windshear warning at around 11 p.m., 8 September. According to the flight data




圖三：飛機數據導出的順風風速（紫色線）及飛機高度（藍色線）
Figure 3 : Tailwind (purple line) and flight altitude (blue line), as extracted from flight data

天文台早於9月8日下午11時左右發出風切變警告。從飛機數據可見（圖三），航機於香港時間9月9日0時7分下降至高度約一千多英尺時，航機遇到的順風超過每小時20海里。當飛機進一步下降至700英尺時，順風增強至每小時37海里（圖三的標示A）。由於順風風速遠高於班機規定的上限（即每小時15海里），所以最終決定轉飛澳門。

(Figure 3), when the aircraft descended to around 1,000 feet above the runway at 00:07 Hong Kong Time, 9 September, the tailwind experienced by the aircraft exceeded 20 knots. As the aircraft descended further to 700 feet, the tailwind continued to increase and reached 37 knots (Label A on Figure 3). The tailwind far exceeded the limit of 15 knots for the aircraft. The aircraft had to divert to Macao eventually.



圖四：位於新界大欖涌的機場多普勒天氣雷達
Figure 4 : Terminal Doppler Weather Radar at Tai Lam Chung, New Territories

為保障航空安全，香港天文台一直密切監察天氣情況，並會發出警告。天文台的機場多普勒天氣雷達（圖四）會不斷掃描機場各跑道，以探測颱鋒及風切變，並適時發出風切變警告，讓機師盡早知悉有關的惡劣天氣情況

李本瀅，謝淑媚
2010年12月31日

To ensure flight safety, weather conditions are closely monitored and warnings are issued by the Hong Kong Observatory (HKO). A Terminal Doppler Weather Radar of HKO (Figure 4) continuously scans the runway corridors to detect the existence of any gust front or windshear. Timely windshear warnings are issued to give pilots an early alert about the inclement weather.

LEE Boon-ying, TSE Shuk-mei
31 December 2010

註：
由於有些國家或地區仍然採用英制，為避免混亂，航空業務上仍沿用英尺、海里等非國際標準單位。

Remark :
Some countries or places are still using the Imperial units. In order to avoid confusion, non-standardized international units, e.g. feet, knots, etc., are still in use in aviation.

# 流動的天文台

# Weather on the move

天文台網站極受公眾歡迎，每年的瀏覽數字由90年代中的數百萬次激增至2009年的十六億次。隨著智能手機及筆記本電腦的發展，天文台開發了一系列產品，令市民可隨時隨地得知最新的天氣資訊。這些產品已引起社會不少人士的注目。本網誌介紹當中一些產品。

現時的智能手機可以自動偵測用家身處的位置（為保障私隱，這功能可關閉）。隨著這項技術的發展，與用家位置相關的天氣資訊可以直接向其輸送。當然，除用家身處的位置外，他／她也可選擇香港境內的任何地點。

**閃電戒備服務**

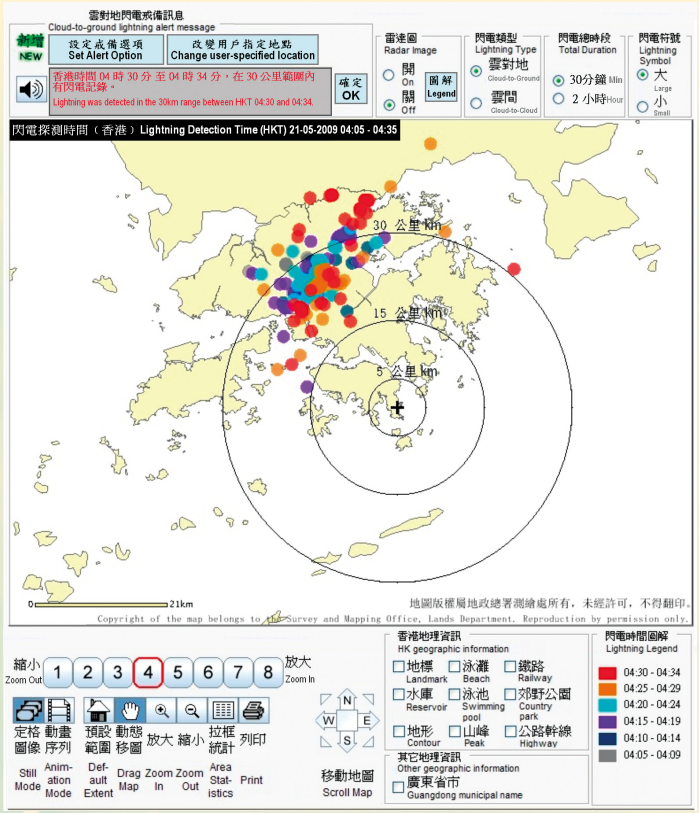
透過閃電戒備服務，用家除可得知香港境內錄得之最新閃電位置分佈外，還可自選多

The Observatory website has enjoyed increasing popularity, with the number of page visits increasing from a couple of millions in the mid-1990s to 1.6 billion in 2009. In the advent of smartphones and netbooks, the Observatory has developed products to ensure users get the latest weather information anywhere and at anytime. These have already attracted a considerable number of members of the public. This blog introduces some of the products.

A smartphone allows the automatic determination of the user's location (a function that can be turned off to protect the user's privacy). The beauty of this is that weather information specific to the user's location can be 'pushed' to him/her. Of course, he/she has the option to select any location in Hong Kong other than their own.

**Lightning alert service**

The lightning alert service allows the user to access the latest distribution of




圖一：多至三個自選警戒範圍的閃電戒備服務

Figure 1 : Location-specific lightning alert with up to 3 selectable circles

至三個警戒範圍（5公里、15公里和30公里）。而每當有閃電發生在警戒範圍內，該服務會自行發出警示，方便用家隨著閃電移近而逐步提升應變。這項服務能幫助用家就戶外活動（如遠足、燒烤、派對及游泳

lightning strikes detected in Hong Kong. The user can select up to 3 concentric alert circles (5 km, 15 km or 30 km) so that he/she will be alerted once lightning is detected within any of the circles. This enables a graded response by the user in accordance with the proximity of lightning. The feature proves to be very useful in

等）作出合適安排。照我們理解，一些泳池的工作人員已能高效地使用此服務，決定泳池的開關。

**我的天文台**

由本台前助理台長衛翰戈先生命名的「我的天文台」，於年初推出後反應熱烈。它可自動提供最接近的氣象站的天氣資料。因香港擁有複雜的地型及海岸線，不同地區的天氣狀況可以有差別（例如冬季時不同地區的氣溫可相差超過10℃）。為此，全港有超過三十個自動氣象站向市民提供最新的溫度、相對濕度、天氣照片、雨量及風等資料。「我的天文台」會根據用家的位置，自行選取最合適的氣象站。

「我的天文台」iPhone 版於年中為用戶提供了升級版本，徇眾要求加入七天天氣預報、雷達圖像等天氣資料。至今，它已高居免費下載榜的前

planning outdoor activities such as hiking, barbecuing, partying and swimming. We know that swimming pool operators have used this service to great effect in their decision to close or re-open pools.

**MyObservatory**

Named by WAI Hon-gor, our former Assistant Director, MyObservatory has gained instant popularity since its launch early this year. This service automatically seeks out information at the weather station closest to the phone user. Weather tends to vary somewhat across the territory of Hong Kong by virtue of the complex terrain and coastal settings here (for instance temperatures can vary by more than 10°C across Hong Kong in wintertime). For this reason, there are now over 30 weather stations here providing public with the latest temperature, humidity, sky photo, rainfall and wind information. MyObservatory automatically picks the appropriate weather station according to the user's location.

In response to public demand, MyObservatory was upgraded in mid-year to include more weather information such as 7-day forecast and weather radar

列位置多時，而瀏覽數字在短短數個月間亦已超過一億四千萬次。我們亦於Android及個人數碼助理平台上免費提供該軟件。

**Twitter**

作為一個社交網站，Twitter提供了一個有效的渠道發放天氣警告及相關信息。天文台於9月以試驗形式於Twitter發放天氣消息。最新的天氣警告（例如熱帶氣旋警告信號、暴雨警告信號、雷暴警告、酷熱／寒冷天氣警告）會以一個短信的形式（稱為「tweets」）於天文台在Twitter的帳戶「HKObservatory」傳送至跟隨天文台的用家（即「跟隨者」或「followers」）。此外，其他有關資料（包括天文台的最新消息及產品、最新的台長網誌等）也會經Twitter發放。在短短數個月，跟隨者已由數百遞增至數千人。

pictures. It has stayed in the list of top free downloads for some time now. In fact, the visit figure has skyrocketed to 140 millions in just a few months. A similar function is also available on Android and PDA platforms.

**Twitter**

Twitter as a social networking service offers a great way for weather warning and information dissemination. The Observatory's experimental Twitter service was launched in September. The latest weather warnings (including tropical cyclone, rainstorm, thunderstorm, and hot/cold weather warnings), in the form of 'tweets', are now released on the Observatory Twitter profile 'ObservatoryHK' and distributed to 'followers', i.e. users subscribing to Observatory tweets. Other information is also disseminated, e.g. new products and latest news from the Observatory, and release of the Director's blog . The number of followers has grown from a modest few hundreds in the beginning to thousands in the space of a few months.






圖二：iPhone版「我的天文台」
Figure 2 : MyObservatory on iPhone




圖三：Android版「我的天文台」
Figure 3 : MyObservatory on Android




圖四：利用Twitter發放天氣警告信息

Figure 4 : Twitter as a means to disseminate weather warnings

## 天氣無疆界

天文台在8月推出一個名為「大珠三角天氣警告網頁」的試驗版，提供廣東、澳門和香港的實時天氣警告資訊。這入門網頁能夠成功整合了粵港澳三地氣象部門的最新天氣警告資訊，方便公眾瀏覽，實有賴廣東、深圳及澳門有關氣象部門的通力合作。每天往來大珠三角地區的居民及學生，從此可輕易透過智能手機，得知粵港澳三地最新天氣警告資訊。

## Weather knows no boundaries

The Observatory has launched in August an experimental webpage displaying in real time weather warnings issued by Guangdong, Macao and Hong Kong. In this Pearl River Delta (PRD) service, the latest weather warnings from all these weather services are integrated onto a single page for easy access by people. It would not have been possible without the co-operation of our Guangdong, Shenzhen and Macao counterparts. Commuters and school children having to cross the borders each day will find it a very handy service




圖五：大珠三角天氣警告資訊唾手可得
Figure 5 : PRD weather warnings at your fingertips

如果你有新想法，歡迎向我們提出。

on their phones.

If you have other ideas, let us know.

李本瀅

2010年12月10日

LEE Boon-ying

10 December 2010

以上產品的連結：

1. 閃電戒備服務：http://www.weather.gov.hk/wxinfo/llis/alert_indexc.htm
2. 我的天文台 iPhone 版本：http://itunes.apple.com/hk/app/myobservatory/id361319719?mt=8
3. 我的天文台個人數碼助理版本：http://pda.weather.gov.hk/locspc/locspc_portal_uc.htm
4. Twitter（中文）：http://twitter.com/HKObservatory
5. 大珠三角天氣警告網頁（試驗版）：http://www.weather.gov.hk/wxinfo/gprd/index_uc.htm

Links to the above products:

1. Lightning Alert Services : http://www.hko.gov.hk/wxinfo/llis/alert_index.htm
2. MyObservatory (iPhone version) : http://itunes.apple.com/hk/app/myobservatory/id361319719?mt=8
3. MyObservatory (PDA version) : http://pda.weather.gov.hk/locspc/locspc_portal_e.htm
4. Twitter (English) : http://twitter.com/ObservatoryHK
5. Greater Pearl River Delta Weather Warning Webpage (Beta Version) : http://www.weather.gov.hk/wxinfo/gprd/index.htm