香港天文台
HONG KONG OBSERVATORY

"Everybody talks about the weather, but nobody does anything about it." But we do! The Hong Kong Observatory and the world meteorological community do! Weather is now a global issue, we are doing everything possible about it.

P. Sham

What gave the forecasters a firm inkling that Rose was continuously approaching was not a sharp atmospheric pressure drop, nor a significant strengthening of local winds. It was the unrelenting increases of “microseisms” recorded by the seismometers.

Robert Lau

鑑於島上的惡劣環境，回來後同事們楊繼興、吳建輝及丘禮堅等將自動站的軟硬件重新設計……安裝方面亦考慮了海水腐蝕、野外環境及溫度變化等影響。這些設計非常成功，黃茅洲氣象站自1985年起得以運作。

林鴻鋆

天文台便推出了新措施，在掛起八號風球前發出兩個小時的預警，政府帶頭採取按員工情況分批下班的安排，又鼓勵其他機構跟隨，加上交通運輸行業相應配合，以及後來加了月台幕門，「幸運」得以延續到今天，不過天文台在運作風球制度時，再也不能不考慮風球本身可能造成的潛在殺傷力。

林超英

香港天文台在*(WMO RAII)*會上建議了三個試驗計劃，範疇分別是數值天氣預報，氣象衛星數據，產品及培訓，以及地面、高空及氣候觀測數據的質量管理，均可對區內甚至全球氣象學有長遠影響。……正是因為天氣無國界，如果能夠促進區內氣象學的進一步合作，對香港、本區甚至全球均有裨益。

李本瀅

「一個傍晚，一位來自皇家天文台的Evans先生在屋頂給我們作了一個關於星星的講座。」這故事來自一位已經93歲多的老太太Barbara Anslow的日記簿。…… 在香港淪陷時……我們的老台長不單沒有受到逆境的影響而變得沮喪，反而孜孜不倦地為本來各不認識但卻同病相憐的「戰友」上了天文的一課。Evans台長在逆境中發揮正能量，感染周圍的人去積極面對逆境，不但令人敬佩，也值得我們細心回味和學習！

岑智明

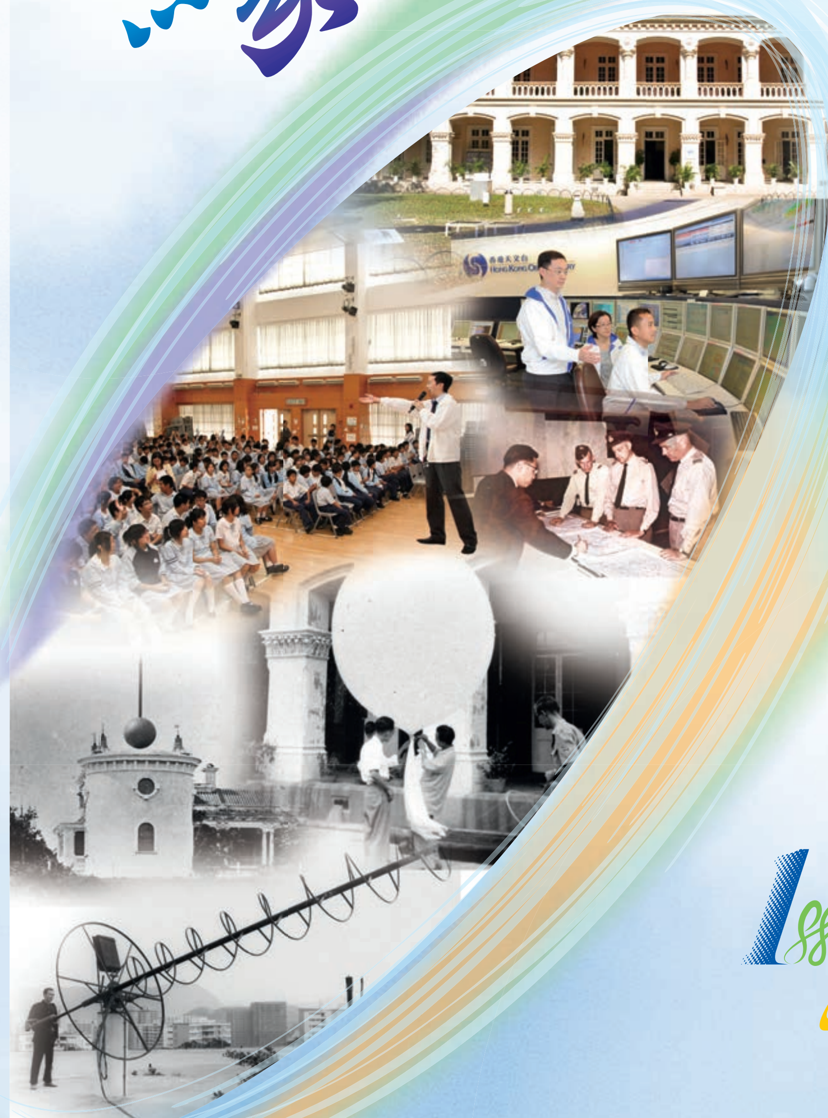
N56241300B0

ISBN 978-962-02-0402-9
9 789620 204029

有緣相聚 Under the same sky
Weathering the Storms Series 風雨人間系列

風雨人間系列
Weathering the Storms Series

有緣相聚
Under the same sky



香港天文台
HONG KONG OBSERVATORY

風雨人間系列
Weathering the Storms Series

130 有緣相聚
Under the same sky

有緣相聚 Under the same sky

出　　版：香港天文台

設計製作：紀歷有限公司

印　　刷：香港政府物流服務署

版　　次：2013 年 3 月初版

國際書號：978-962-02-0402-9

前言

香港天文台於1883 年在九龍尖沙咀一個名為“艾爾尊山”的小山崗上成立，在過去130 年為香港市民和各界提供天氣、報時、地球物理和其他的服務，不斷與時並進、精益求精。當中雖然也經歷了不少風雨，但我們的前輩以堅毅的信念和專業的精神，克盡己任，使天文台不斷茁壯成長。

我希望藉著慶祝天文台130 周年之際，可以與各位回顧過往曾經遭遇到的天災，溫故而知新，在全球氣候變化可能帶來更多極端天氣的趨勢下，不忘做好防災減災工作的重要性。同時，我們亦可以回味從同事和夥伴的口中、筆下和珍貴照片所娓娓道來的天文台點滴和一些鮮為人知的故事，使這些集體回憶可以傳承下去。

一百三十年相對人的一生看似很長，但在人類歷史的洪流中，只是滄海一粟。然而，我們很慶幸能透過香港天文台這一「粟」，匯聚了一班充滿熱誠和敢於承擔的同事，多年來與不同的持分者、學者和同行建立了良好的夥伴關係和深厚友誼。大家一起風雨同路，這正好展示了本書的主題《風雨人間：有緣相聚》。天文台的服務有今日的成就，實有賴眾人所付出的努力一點一滴累積而成。現謹藉此機會衷心感謝各位，並希望與大家繼續攜手合作，為香港以至世界更美好的未來作出更大努力！

香港天文台台長

岑智明

2013 年世界氣象日

Foreword

The Hong Kong Observatory (HKO) was established in 1883 on a small hill named "Mount Elgin" in Tsim Sha Tsui, Kowloon. Throughout the past 130 years, the Observatory provides services in weather, time, geophysics and other areas, always evolving with time and striving for excellence. Although there were stormy times, the Observatory has continuously grown strong, thanks to the professionalism, perseverance and commitment of our predecessors.

While celebrating the 130th anniversary of the Observatory, I hope we could all take a moment to look back on the weather disasters in the past and reflect on how we could learn from history. With the probable trend of more frequent extreme weather brought by global climate change, we should not forget the importance of disaster prevention and mitigation work. At the same time, through the valuable reminiscences and memorable photographs of our colleagues and partners, previously untold stories and bits and pieces of the Observatory could be recollected, and such collective memories could be preserved for the future generations.

130 years is not short compared with a human lifetime, but from the perspective of human history, it is just a drop in the ocean. We are glad that through this "drop" of the Observatory, many generations of colleagues with passion and commitment have come together and built up good partnership and friendship with stakeholders, scholars and counterparts. Together we have worked hand in hand through rain or shine, thus the theme

of this book – “Weathering the Storms : Under the Same Sky”. The Observatory could not have grown and developed to what it is today without the cumulative efforts. I would like to take this opportunity to express my sincere appreciation to everyone, and I look forward to continuing to work together with you in the years to come for the betterment of Hong Kong and the world.

Shun Chi-ming
Director of the Hong Kong Observatory
World Meteorological Day 2013

目錄

亦師亦友
Friends and Advisors

本台今昔
Observatory Now and Then

細數風雲
Weather and Records

130 有緣相聚

Under the same sky

風雨同行

Collaborations in storm and rain

130
有緣相聚
Under the same sky

觀天為民百年 護佑民生道遠

祝賀香港天文台建台 130 周年

鄭國光，中國氣象局局長
Zheng Guo-guang, Administrator of China Meteorological Administration

---

Dr. Zheng Guo-guang, Administrator of China Meteorological Administration (CMA), congratulates the Hong Kong Observatory (HKO) on its 130th anniversary. He witnesses the developments and achievements of the Observatory, building on its culture of science, service and innovation. What Dr. Zheng cherishes most is the long-term co-operation between CMA and HKO in a wide range of areas, including exchange of meteorological information, meteorological research and technologies, climate change as well as training and experience sharing. He looks forward to further enhancing the mutual cooperation between CMA and HKO in areas like public weather services, disaster prevention and mitigation, for the betterment of the society and the well-being of the public.

在香港天文台建台130周年之際，我謹代表中國氣象局表示由衷的祝福！

130年甲子輪回，薪火相傳；130年洞達天象，為港為民。香港天文台幾代氣象同仁秉承“以科學保障大眾安全，建設美好社會，樹立世界模範”的理想，沐風櫛雨，繼往開來，百多年來，忠實見證了獅子山下、維多利亞港的氣象萬千，風雲變幻。

肇始於1883年的香港天文台，從最初的目測和簡陋觀測系統，發展到覆蓋海陸空的多種現代化觀測手段；從僅有的簡單氣象預報，發展到世界領先的預報預警和服務體系；從起初的幾位創業者，發展到幾百餘人的科技精英團隊，香港天文台走過了光榮且不平凡的歷程。香港天文台幾代氣象同仁紮根科學、敬業開拓，在天氣氣候、授時、地震、海洋和天文等領域不斷創新理念，服務公眾，在城市氣象災害預報預警領域獨樹一幟，在數值預報模式開發應用等方面的業績可圈可點，特別是以公共氣象服務為引領，在氣象預警信號、智慧氣象服務等領域開創先河，切實擔負起了“提供實用和有效的氣象服務”的使命。

130年來，香港天文台彌足珍貴的氣象資料為中國乃至全球的氣象預報服務和科學研究提供極有價值的貢獻。伴隨著香港從昔日的小漁村發展為中西薈萃、多元共融、活力澎湃的國際大都會，在“自由開放、追求卓越、積極進取、勇於創新、優質生活”香港核心價值觀統領下，根植於香港城市文明而形成的“開明開放、求真求新、敬業樂業、靈活進取、多元合作、集思廣益”的香港氣象人精神信念，亦成為香港文化光芒璀璨、不可或缺的組成部分。香港天文台不僅在全球氣象科學領域獨領一幟，而且在文化傳承、建築藝術、服務理念等方面更具特色，為香港近現代科學文化發展進程積累了寶貴財富。

祖國內地與香港地緣緊鄰、海陸大氣相通，兩地氣象同仁在公共氣象服務和氣象防災減災等領域所面臨的問題和挑戰相似。自1975年建立北京-香港氣象電路、正式交換氣象資料以來，中國氣象局與香港天文台先後簽署了《氣象科技長期合作諒解備忘錄》、《氣象科技長期合作安排》等協議，在氣象探測、氣象通信、天氣預報警報、氣象服務、氣候變化、人員互訪、科學研究和科學試驗、教育與培訓等領域開展了廣泛交流合作，共建氣象觀測站網、共用氣象探測資料、共擔天氣預報預警之責，共商應對氣候變化之策。我們都不會忘記，內地與香港的氣象科技人員在北京奧運氣象服務、上海世博氣象服務、港珠澳大橋建設等氣象服務中的密切合作。我們都不會忘記，內地與香港在參與世界氣象組織（WMO）、政府間氣候變化專門委員會（IPCC）、颱風委員會等國際和區域合作過程中，相互支援、相互配合，聯合發揮了積極作用。回顧內地和香港氣象事業交流合作、優勢互補、共同發展的歷史，我們同感欣慰與自豪。

鄭國光局長（中）和天文台台長岑智明（右一）在2007年3月主持亞洲區航空氣象服務網準業務運行儀式

香港天文台成立130周年，也是中國氣象事業發展史上的一件大事。展現香港百年氣象科技進步在城市發展中的重要作用，展示香港在公共氣象服務、氣象防災減災和應對氣候變化等方面的先進技術和理念，展望香港與內地氣象交流合作的美好前景，很有必要，影響深遠。我深信，內地和香港氣象界必將繼續沿著優勢互補、合作雙贏、共同發展的方向，不斷深化全方位、多層次、機制化的氣象交流合作，進一步發揮公共服務、防災減災、護佑民生的重要作用，進一步增進兩地人民共同福祉。祝香港天文台陽和方起，前途光明！祝東方明珠香港的明天會更好！

Air Traffic Control Operations Under Adverse Weather Situations

羅崇文，民航處處長
Lo Shung-man, Norman, Director-General of Civil Aviation

天氣現象如雷暴、湍流、風切變及微下擊暴流等對飛行安全構成影響。颱風期間，航班大多取消或轉飛其他地方。羅崇文處長在文中敘述強颱風韋森特於 2012 年 7 月 23 日襲港後帶來的惡劣天氣如何影響航空交通管制及機場運作，更詳述民航處在航管方面的應對措施。風切變和湍流預警系統發出的預警對飛行安全發揮了重要的作用。天文台的準確航空氣象預測、可靠和高質素服務，為民航處於香港飛行情報區內提供的航空交通管制服務作出了不可或缺的支援。

Weather testifies the power of nature to mankind. Weather phenomena such as thunderstorms, turbulence, windshear and microbursts etc. can induce significant safety impacts to air traffic control (ATC), airport and airline operations. Accurate meteorological forecasts and timely delivery of weather information to aviation organizations and pilots by the Hong Kong Observatory (HKO) are essential in assisting the Civil Aviation Department (CAD) in the provision of safe and efficient ATC service to aircraft in flight and to ensure flight safety for the travelling public.

CAD provides ATC service to all flights operating within the Hong Kong Flight Information Region (HKFIR) including flights departing from and arriving at Hong Kong International Airport (HKIA) and overflights transiting our airspace. It extends over the South China Sea covering an area of 276,000 km^2. Unquestionably, tropical cyclone during summer months is a prominent weather phenomenon which can seriously affect ATC operations. It is not uncommon for flights to be cancelled or diverted to other destinations during the passage of typhoon. Traffic recovery after the passage of a typhoon is always a highly demanding task which requires the concerted efforts from airport stakeholders and neighbouring ATC units in clearing the post typhoon traffic backlog.

Recently Typhoon Vicente struck Hong Kong on 23 July 2012. Hurricane Signal No.10 was issued at 0045 HKT on 24 July 2012. Thirty-six flights carried out missed approaches and 50 flights diverted to other airports. The Windshear and Turbulence Warning System (WTWS) of HKO provided microburst, windshear and turbulence alert in good time to ATC who would then be able to pass on the vital weather information to pilots and other aviation stakeholders. The prompt delivery of such important weather information by ATC is indeed critical to flight safety.

With surface wind blowing at 090 degrees, 50 to 60 knots and with occasional microburst at 35 knots magnitude on the departure path, no flight departed from HKIA on the night of 23 July for almost 9 hours until the first flight departed in the early morning on the following day.

With a low departure rate on 24 July 2012 from early morning to early afternoon (altogether 68 departures), this had resulted in parking bays not being able to be released in time for arriving aircraft. ATC had initiated the HKIA Contingency Aircraft Parking Arrangement in the late morning on 24 July 2012 and lasted until late afternoon on the next day. Landed aircraft had to be held on several taxiways waiting for parking bays. At its peak, 30 arrival aircraft were holding on taxiways waiting for parking bays.

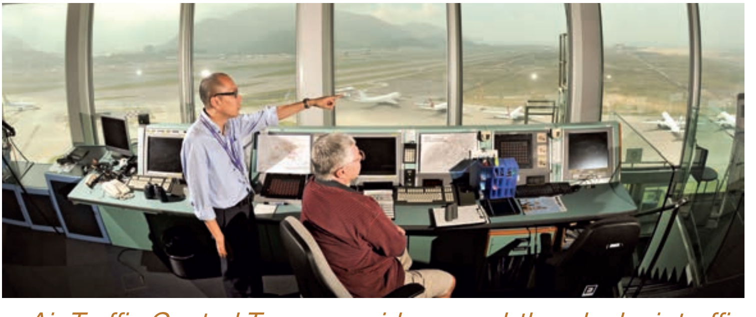
In addition, ATC had to slow down the landing rate, at the expense of enroute holding, in order to contain the number of arrivals holding on taxiways, with a view to minimizing disruptions and hazards to ground traffic and airport operations.

Facing the shortage of parking bays, ATC had also implemented the Ground Departure Holding Procedure on 25 July to speed up the release of parking bays. A maximum of 24 departing flights were assigned to queue up on taxiways before they were actually released for departure in order to vacate parking bays as soon as possible to facilitate bay parking for arrivals.

During the passage of Typhoon Vicente, CAD had maintained close liaison with HKO, Airport Authority Hong Kong, and between Hong Kong and neighbouring ATC units so as to guard against overloading on ATC operations. Air traffic operations eventually resumed normal in the late evening on 25 July 2012.

CAD is very honoured to maintaining a close and collaborative working relationship with HKO over the past years. Accurate and timely weather forecasts require great skill, experience and professional judgement. The consistently reliable and high quality of service provided by HKO has rendered immense support to our provision of ATC service within the HKFIR.

Air Traffic Control Centre



The Air Traffic Control Tower provides round-the-clock air traffic control services to aircraft operating at the Airport.

風雨同行

Collaborations in storm and rain

35 Years of Partnering for Slope Safety

彭沛來，土力工程處副處長
Pang Pui-loi, Richard, Deputy Head of Geotechnical Engineering Office

香港地少山多，而且山勢陡峭。預防暴雨和山泥傾瀉所引發的災害，是政府重要工作之一。彭沛來先生撰文描繪土力工程處與天文台35年來在防禦天災方面的共同努力，從而把山泥傾瀉風險降低。此外，他亦以圖片說故事，細表香港舊日一些我們要引以為鑑的天災。

The Hong Kong Observatory (HKO) provides world-class meteorological services to the public. It has been a strategic partner of the Geotechnical Engineering Office (GEO), Civil Engineering and Development Department during the past 35 years in tackling the landslide problem in Hong Kong.

Hong Kong has a hilly terrain with a substantial portion of urban development located on or near hillsides. Coupled with torrential summer rainfall, landslide is a long-standing problem that Hong Kong people have to face. Many of us can still remember the disastrous landslides in the 1970s, which resulted in a large number of fatalities *(Figures 1, 2 & 3)*. The GEO was set up in 1977. Since then, the GEO has set up a comprehensive slope safety system to manage landslide risk.

Figure 1: Landslide at Po Shan Road in 1972 (67 fatalities)

Figure 2: Landslide at Sau Mau Ping in 1972 (71 fatalities)

Figure 3: Landslide at Sau Mau Ping in 1976 (18 fatalities)

An early warning system plays an important part in Hong Kong's slope safety system. In this regard, the GEO has been operating a Landslip Warning System since 1977 in conjunction with the HKO, to forewarn the public of landslide risk during periods of heavy rainfall.

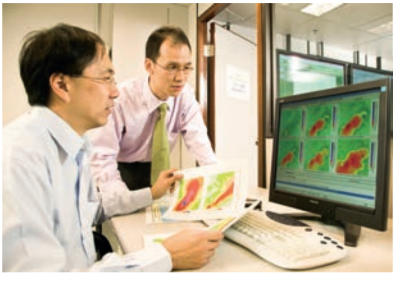


Figure 4: Real-time rainfall data is transmitted to GEO and HKO for use in the Landslip Warning System

Over the years, the HKO has provided expert input in the development of rainfall data collection and nowcasting, for improving the performance of the Landslip Warning System *(Figures 4 & 5)*. The current system is recognized as among the most advanced systems of the kind in the world. Also, Hong Kong has developed an automatic raingauge system with probably the highest density of automatic raingauges amongst the populated cities in the world, starting from 67 raingauges in 1985 and increased to 110 raingauges since 1999.

Figure 5: Locations of GEO raingauges and HKO raingauges in Hong Kong

HKO not only plays a vital part in developing the Landslip Warning System but also in the decision-making process on the issue and cancellation of the Landslip Warning each time. Such a decision has wide-spread impact on the community. It requires state-of-the-art and considerable judgment in rainfall nowcasting and prediction of landslide occurrence, and therefore close liaison between the HKO and GEO.

There is ample record of frequent consultations between the Head of GEO and senior management of the HKO including throughout the nights before the Landslip Warning is issued or cancelled. The ex-Head of GEO, Mr Raymond Chan, in summing up his experience during an interview with the Commercial Radio Hong Kong before his retirement in 2011, said that times of typhoon and rainstorm were particularly demanding. Although about three to five Landslip Warnings are issued in a normal year, the need for consultations between GEO and HKO round the clock far exceeds this frequency *(Figure 6)*. He said that HKO has provided excellent professional support to the GEO in our work.

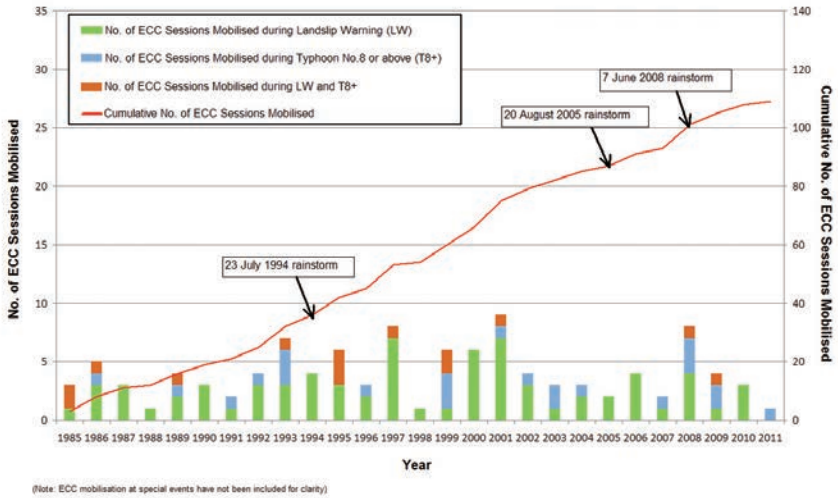


Figure 6: Number of times of mobilization of the GEO Emergency Control Centre (ECC)

The issue of the Landslip Warning triggers the mobilization of the emergency system and Emergency Control Centre in the GEO and other government departments to deal with reported landslides and any aftermaths arising.

A review of the landslide statistics since 1985 has indicated that more than 90% of the fatal landslides occurred when the Landslip Warning was in force. This indicates that the Landslip Warning is a reliable means in giving forewarnings of potential landslide danger to the public.

The effectiveness of the Landslip Warning System depends on members of the public taking the necessary personal precautions when the warning is in force. The GEO has joined force with the HKO and others to launch a range of public education activities. These include a year-long major public education campaign "Safer Living - Reducing Natural Disasters" in 2005 and the “Safer Slopes Safer Living Fiesta” in 2010 *(Figure 7)*. The objectives are to promote public awareness on slope safety and natural disasters, and to encourage members of the public to take appropriate precautionary measures during periods of heavy rainfall.

Figure 7: Upper photo: Mr Lam Chiu-ying (centre), former Director of the HKO giving an opening speech in “Safer Living - Reducing Natural Disasters” Campaign in 2005 and lower photo: Dr Lee Boon-ying (far left), former Director of the HKO and Mr Raymond Chan, former Head of GEO (far right) with other officiating guests at “Safer Slopes Safer Living Fiesta” in 2010 to promote public awareness on slope safety and personal precautionary measures against natural disasters

Regular liaison meetings between the senior management of the HKO and GEO are held to review the performance of the Landslip Warning System and to strengthen collaborations on areas of common interests *(Figure 8)*. Studies are being undertaken by the GEO in conjunction with the HKO to update the current estimate of the Probable Maximum Precipitation for Hong Kong, with a view to further enhancing our landslide emergency preparedness planning.

Figure 8: Upper photo: Members of the Slope Safety Technical Review Board (front row) received by Mr Lai Sau-tak, Edwin and Mr Chan Ying-wa (third and fourth from the left in the back row) at the HKO in 2007 and lower photo: Delegation of GEO headed by Mr John Massey (fourth from the left) at the annual liaison meeting between GEO and HKO in 2009 with Mr Wai Hon-gor, Mrs Lam Kwong Si-lin, Hilda and Mr Leung Yin-kong (fifth, sixth and ninth from the left) of HKO. First on the left is the author.

Following the 7 June 2008 rainstorm which triggered widespread natural terrain landslides on Lantau, the GEO has further improved the landslip warning algorithm. Its operation relies on expert input from the HKO on rainfall nowcasting. The GEO has also collaborated with the HKO to undertake studies on rainfall patterns under a range of climate change scenarios for assessing the impact of extreme weather events on slope safety *(Figure 9)*.

Figure 9: 7 June 2008 natural terrain landslides in Tai O

Today, the landslide risk in Hong Kong has been reduced to an as low as reasonably practicable level. This achievement owes much to the excellent support and dedication of the staff of the HKO. In this regard, the GEO would like to take this opportunity to express sincere gratitude to all the staff in the HKO for their contribution in providing Hong Kong with a better living environment. The GEO looks forward to continuing the close partnership with the HKO in the years to come, to further enhance slope safety in Hong Kong.

The Observatory and the Government Flying Service-a Partnership in Aviation Services

華永樂機長，政府飛行服務隊
Captain Hud Vowell, Government Flying Service

　　華永樂機長自 80 年代初已透過啟德機場氣象所的航空預報員獲取所需的航空氣象資訊，從此和天文台建立了悠久的夥伴關係。華永樂機長在本文分享政府飛行服務隊和天文台在多方面的合作，包括風切變和湍流研究，熱帶氣旋的氣象數據收集，以及輻射監測，亦展望未來更多具創意的合作機會。

In common with many aviators in Hong Kong, I have for a long time been a satisfied customer of the Aviation Meteorological Services provided by the Hong Kong Observatory (HKO).

In my first post as an Air Traffic Controller at the old airport at Kai Tak, starting in 1982, I was able to visit the Briefing Office just one floor below our operations centre at the western end of the passenger terminal building.

When I began flying with the Royal Hong Kong Auxiliary Air Force in 1984, it was always a pleasure to turn up at the Briefing Office and have the carefully prepared briefing pack ready and waiting, followed up by a thorough verbal briefing from the duty forecaster.

Ahhh......those were the days of conversation and face to face contact.

I am still flying with the Government Flying Service and I still rely on the services of the HKO Airport Met Office, but now it is all via internet connections and web sites.

Just a couple of months ago I was privileged to visit the Airport Met Office in the Control Tower building at Chek Lap Kok (CLK). It was no surprise to once again observe the professionalism and dedication of this small group of staff, still going about their business of providing Hong Kong's aviation community with all the necessary up to the minute meteorological information.

The real point of my story though is to tell how in more recent times, the Government Flying Service (GFS) has been able to work even more closely with the HKO, not so much as a user of the HKO information, but more as a provider of a variety of services with its helicopter and fixed wing fleets.

Specific tasks which the GFS have carried out include radiation monitoring flights, low level windshear and turbulence investigation, tropical cyclone data collection and the use of helicopters to transport HKO personnel to and from some of their remote equipment sites.

All the data and information gathered from the hundreds of flights over the years has contributed to the overall accuracy and efficiency of the service being provided by the HKO.

GFS helicopter over the Victoria Harbour

The GFS helicopters can carry an Aerial Monitoring System provided by the HKO which can measure the ambient radiation levels at the surface and at various altitudes over the territory of Hong Kong. These survey flights are carried out at regular intervals and in differing weather conditions, and the data collected is used to provide background values for assessment purposes in the case of any accidental release of radiation from the nuclear power stations in Daya Bay to the northeast of Hong Kong.

In the unlikely event of such a release, a GFS helicopter will be required to assist in detecting and locating any radioactive plume which may have entered Hong Kong territory, and to measure the ground contamination after the plume has passed. Obviously, the GFS will also be involved in the subsequent post incident/accident operations, for instance, evacuation operations at certain remote sites and villages.

At the very early construction stage of the current airport at CLK, the GFS fixed wing aircraft flew hundreds of hours of evaluation flights recording the strength of windshear and turbulence over the airport platform and around Lantau Island. There were no electronic data collection tools in those early days, just a clip board and a pen and a subjective assessment by the crew members on board. “What do you think about that… maybe moderate…maybe severe?” However, the information gathered certainly confirmed what was already predicted; that Lantau Island would provide some very interesting and potentially hazardous windshear conditions to the operators at the “new” airport.

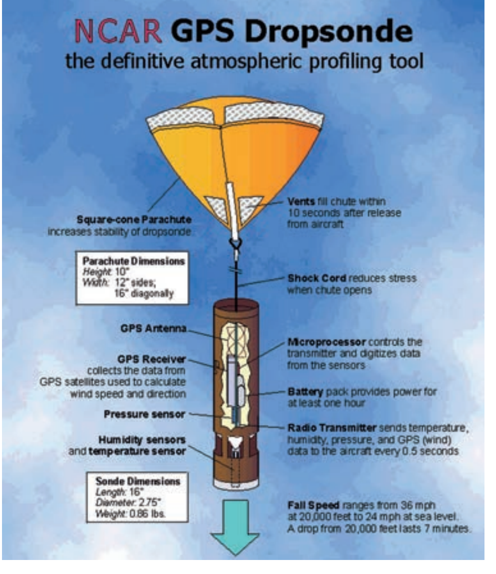
GFS Jetstream 41 aircraft with a specially designed data collection probe.

As the technology of ground based monitoring equipment developed, so too did the airborne equipment, and in July 2009, a specially designed data collection probe was fitted to the wingtip of one of the GFS Jetstream 41 aircraft. Initially, up to 6 flights per week, mornings and evenings, were dedicated to this task of collecting windshear and turbulence data on the approach and departure paths of the two runways at Chek Lap Kok. The meteorological data including air density, pressure, temperature etc. when combined with the navigation inputs from the aircraft systems, have enabled the HKO to make comparisons with computer models and more accurately assess and predict the occurrence of windshear and turbulence at CLK.

A more recent innovation from HKO has seen the same data probe equipped Jetstream aircraft flying out to meet some of the tropical storms as they enter the South China Sea. These flights involve flying two tangential lines across the approaching face of the storm at 10,000 and 3,000 feet above mean sea level (amsl). The collected data is then analysed and used to more accurately predict the potential severity of the storm and its projected track. The same technology has also helped in determining the intensity of heavy rainfall areas as they approach Hong Kong, and this has helped with better predictions and timely warnings about such events.

GFS will take delivery of the new Bombardier Challenger 605 jet aircraft in 2013.

In November 2013, GFS will take delivery of the first of two new Bombardier Challenger 605 jet aircraft. These aircraft will not only significantly boost the Search and Rescue range of the GFS but will also provide the platform for more advanced meteorological data collection. The aircraft will be fitted with tubes which allow the dispensing of a series of dropsonde data collection and transmitting devices.



Up to four lightweight dropsondes can be launched in one go from the aircraft, each with its own parachute will descend through the atmosphere measuring air pressure, temperature, relative humidity and wind direction and speed several times per second. From the aircraft's maximum operating altitude, the dropsondes will be able to measure approximately 13 minutes of data, and will transmit this data back to receiving equipment installed on board the aircraft. It is proposed that the radiosondes will be dropped into and along the leading edge of tropical storms and the data will be made available to the HKO to assist in more accurately predicting the direction and strength of the storms.

With the cooperation of neighboring countries, it may also be possible to extend the area of operation into their airspace, thereby improving the accuracy of the tropical storm information and enhancing the early warning capabilities of their respective meteorological services.

In summary, the relationship between the HKO and GFS has always been one of mutual cooperation, and GFS, in keeping with its motto "Semper Paratus" will always be ready to further enhance and carry this cooperation forward with the introduction and development of new equipment and technology.

風雨同行

許永鏍，廣東省氣象局局長
Xu Yong-ke, Director-General of Guangdong Meteorological Bureau

Mr. Xu Yong-ke, Director-General of Guangdong Meteorological Bureau, gives an account of the cooperation with the Observatory in information exchange and research. He particularly highlights that cooperation between Guangdong and Hong Kong in strengthening public safety has set a good example of regional meteorological cooperation in China.

山水相連，氣息相通，粵港兩地有著密切而深厚的地緣、親緣和文緣關係，深入的合作和廣泛的交流，讓兩地氣象人建立了真摯的友誼。

從上世紀八十年代以來，有許多香港天文台同事到廣東省氣象局交流訪問，通過他們優雅的言談舉止，讓我對香港天文台有了美好的印象，也讓我從此不斷地關注香港天文台，看香港電視台天氣節目、瀏覽天文台網頁、下載“我的天文台”手機用戶端......我曾不止一次地對我的同事講，要向香港天文台的同行學習，學習香港同行以人為本的服務理念、持之以恆的研發精神、精益求精的做事態度、和諧快樂的工作氛圍。

廣東省氣象局和香港天文台的合作交流十分頻繁，近年來，雙方的溝通合作更加密切。

在資料的交換方面，已從最初的風球與暴雨信號資料的即時交換、合建海島自動站資料的交換，到後來發展到所有自動站網實時資料、雷達實時資料的交換、中尺度模式產品交換、風廓線資料的交換、季風監測和季風爆發日期等信息的交換等等。資料的傳輸方式也由最初的專線傳輸方式發展到計算機網路或商業衛星通信的方式，現在則更多地利用便利的互聯網進行資料交換。

我們雙方同時發展並加強了在科研領域的合作，包括資料分析系統、資料同化技術等方面的合作，中尺度數值天氣預報研究的合作，季風監測及預報技術的合作，建設中尺度資料庫的合作，氣象雷達應用及研究的合作等等。近年來，我們在地質災害、灰霾（煙霞）、覆蓋珠江三角洲的閃電定位網路等方面的合作也初見成效。

在人員的交流方面，我們也最初互派一線的預報、測報、科研業務人員進行短期的交流學習，發展到互派業務、管理人員的

二零零零年粵港澳中尺度數值模式會議

學習交流，對先進的氣象預報、科研、服務和管理等各方面進行取長補短。

在一些重大活動中，我們雙方的合作也卓有成效，例如：奧運氣象服務保障、亞運氣象服務保障、深圳大運會氣象服務保障等等。

粵港合作已成為中國區域氣象合作的亮點。粵港這樣多方位的業務合作，不僅提高了雙方氣象預報和服務能力，也大大提高了雙方服務本地社會經濟和安全保障能力。

今年，是香港天文台建台130周年，讓我們風雨同行，精誠合作，共同提高粵港氣象預報水平，努力造福兩地萬千百姓。

二零零四年珠江三角洲自動氣象站合作二十周年誌慶

二零零七年粵港澳合建惠東閃電定位站落成儀式

2011 年 6 月 7 日，香港天文台台長岑智明在廣東省局長許永錁的陪同下瞭解廣東省氣象微博服務情況

岑台長（左）於廣東省氣象局致送紀念品予許永錁局長

The Pilot’s Viewpoint

鷹萬里機長，國際航空公司飛行員協會
Captain Brian Greeves, International Federation of Airline Pilots' Associations (IFALPA)

鷹萬里機長曾為國際航空公司飛行員協會（IFALPA）的代表，出任國際民航組織（ICAO）低空風切變及湍流研究組成員；亦曾長期服務於香港國際機場新機場安全委員會、機場業務安全委員會、風切變及湍流工作組和航空氣象聯絡組。他在航空界獲得不少獎項，包括國際航空公司飛行員協會最高獎項及英國皇家飛行員及導航協會會長獎項。鷹萬里現時定居澳洲，繼續為澳洲氣象局及多個航空組織提供安全及技術顧問支援。

鷹萬里機長與天文台共同為本港航空氣象服務的發展，合作了 20 多年，他以機師的角度見證了天文台在航空氣象各方面的努力、專業服務和建樹；當中亦詳述他於 2010 年出席世界氣象組織「航空氣象委員會」的情況，並見證了岑智明先生（現任台長）當選為委員會主席。

Captain Brian Greeves was the IFALPA (International Federation of Airline Pilots' Associations) representative to the ICAO (International Civil Aviation Organization) Low Level Wind shear Study Group. He has served on the HKIA (Hong Kong International Airport) New Airport Safety Committee throughout its tenure and was, until recently, a member of the Airport Operational Safety Committee, the WTWS WG (Windshear and Turbulence Warning System Working Group) and the Liaison Group on Aviation Weather Services. He has received several awards, including the CN SAYEN Award, the International Federation of Airline Pilots Associations' highest award, and the Guild of Air Pilots and Air Navigators Master's Award for the Hong Kong Region, for his contribution to aviation safety and technical matters. He now lives mostly in Australia where he continues to provide safety and technical advice to various aviation organisations, including the Bureau of Meteorology.

I remember having a very pleasant lunch with one of the previous directors of the Hong Kong Observatory (HKO), just after he took up his post. He asked me what the HKO could do to help the pilots. I answered very simply, "Please give us accurate forecasts". I was not trying to be facetious or even rude, but to emphasise how important it is to the pilot to know what the weather will really be like. I subsequently made a presentation called the "Anatomy of a Flight" to some of the forecasters and HKO staff. In this presentation, I tried to explain each stage of the flight from planning to making the approach and landing; and even getting home in a typhoon.

I know when I used to look out of my study window, when I lived in Hong Kong, at the rain coming down the Lamma Channel, how difficult it is to get it absolutely right. The Hong Kong Special Administrative Region is a very small land area and is very susceptible to small changes in the weather. Despite this very real challenge, over the years the HKO (and before 1997, its predecessor the Royal Observatory [RO]) has worked continuously to improve the meteorological services delivered to the aviation industry and the community as a whole. I have been privileged to be part of that process by my participation as a pilot representative in various working groups. This essay reflects on a few of the highlights, as part of the celebration of the HKO 130 years of existence.

Wind shear and Turbulence

During the last few decades, the International Federation of Airline Pilots Associations [IFALPA] and the local pilot association (Hong Kong Aircrew Officers Association [HKAOA]; later the Hong Kong Airline Pilots Association [HKALPA]) have been actively involved with the Observatory in working groups with the objective of making the Hong Kong airport safer and more operationally efficient by developing systems that are able to provide real time information on wind shear and turbulence to the pilots, enabling the crews to make the necessary operational decisions, whether it be to continue the approach or to carry out a go-around; or to delay the take-off.

Operational Windshear and Warning System - The Beginning

The Hong Kong Observatory (and its predecessor, the Royal Observatory) has been involved in low level wind shear and turbulence warning systems (WTWS) for 30 years, previously at Kai Tak and subsequently at the HKIA. Hong Kong can now "boast" one of the most sophisticated ground-based WTWS in the world. This has come about through the cooperation of the various members of the WTWS WG, previously called the Operational Windshear and Warning System (OWWS) Working Group. I remember the first meeting of the OWWS WG. It was held in a room in the then HKCAD building and I know that I had difficulty finding it. The meeting was chaired by Captain Jim Adams, who I had met before, when he worked for Danair, an airline sadly no longer in existence. Amongst the members of this new WG, was a quietly spoken scientific officer from the RO: Sharon Lau. This was my introduction to Sharon, who I quickly realized was an incredibly knowledgeable and passionate person, despite her external demeanor. [Later I was to meet CM Shun, CM Cheng, PW Li, Olivia Lee, BL Choy, PW Chan, Sandy Song and others, all of whom showed that same quiet determination coupled with the intellectual capacity, to make the system a "world beater" and to provide pilots with "real-time" warnings.]

At that time, my knowledge level was reasonably low, though I knew something about windshear and turbulence through my experience, as a pilot, and through my participation in the IFALPA Aircraft Design and Operations (ADO) Committee. My mentor there was an American pilot called Bill Melvin. Bill knew more about wind shear and turbulence than any other pilot I have ever met; and probably more than a lot of the “experts”. Whilst I will never be able to emulate Bill, his guidance and the education that I received as part of the WTWS (OWWS) and from my friends in the HKO, ensured that I was able to contribute as the IFALPA representative to the ICAO Low Level Wind shear and Turbulence Study Group [ICAOWIST SG] and help in rewriting the ICAO Manual on Wind shear and Turbulence.

Our task in the OWWS WG was to consider the proposed system for the installation of a wind shear and turbulence warning system for the new airport to be built at Chek Lap Kok; then a small island off the north shore of Lantau Island. The trials flown by RHKAAF (Royal Hong Kong Auxilary Air Force, now GFS) and the observations by the LIDAR (Light Detection and Ranging) and other sensors confirmed that windshear and turbulence would be experienced, as a result of the terrain coupled with greater exposure to thunderstorms and to other phenomena. The original system was designed by the US National Center for Atmospheric Research (NCAR), which I later visited in its HQs in Boulder, Colorado. It was to consist of a Terminal Doppler Weather Radar (TDWR) (a proven detection system for wind shear associated with convective activity) and a diagnostic system based on algorithms and sensors. Whilst the TDWR was proven technology, this was the first time that it was to be used over a “marine environment”, which posed problems in terms of interference. I was very optimistic about this system, which probably showed my lack of knowledge at that time. The other decision made by the WG was to use the “FAA Phraseology” and the “maximum intensity-first encounter” logic for the alerts.

The WTWS is born

Sometime later (and I cannot remember exactly when), Captain Mike Davis succeeded Jim Adams as the chair and the WG was, in time, renamed the WTWS WG. Mike brought a new pragmatism to the WG and under his chairmanship, the WTWS evolved into the system it is today.

Developments and Enhancements

Along the way, there have been some major developments introduced by the HKO. The capability for the TDWR to operate in a marine environment; the siting of additional anemometers on weather buoys in the waters around HKIA to provide better sensing coupled with algorithms (developed by the HKO) to integrate this information into the WTWS; and in association with the LIDAR, making it possible to see shear lines forming and to predict wind shear on the approach/departure of the individual runways; the use of the first operational Doppler LIDAR in the world to detect windshear and turbulence in clear air; and subsequently a dedicated LIDAR for each of the north and south runways.

Captain Brian Greeves (left) and Mr. H.G. Wai of HKO (right) at the HKO Media Briefing on the World's first LIDAR Windshear Alerting System

Promotion and Recognition

I was happy to help promote the development and enhancement of the system both within the WTWS and also in submissions to the government, press conferences and on television and radio. I was especially pleased when the HKO won the top award at the Hong Kong Information Technology and Communications Award Ceremony in 2010 against 680 competitors. As well as winning the Grand Award for the Best Innovation, it also won the "Award of the Year", the grand overall award, against very stiff competition. This was a tremendous accolade and reflected the outstanding world leading technological innovation that has helped to provide real time windshear and turbulence alerts to pilots landing or taking off at the HKIA.

Phraseology

We also made a decision to change the WTWS Alert Phraseology. It became evident that the “FAA Phraseology” was confusing, especially to pilots that had English as a second language. After surveying various pilots that flew into Hong Kong, we proposed that the “Maximum intensity-first location” should be changed to give a more general location i.e. runway, approach or departure; whilst the word “Caution” should be used before each alert to heightened the pilots’ awareness that this was important safety information. There was a lot of debate and resistance from the US, but this phraseology has now been adopted by ICAO as an alternative to the “FAA Phraseology”. It is interesting that it is now some of the US pilots that are confused!

Education

One of the greatest difficulties was educating pilots and air traffic controllers on the capabilities and the limitations of the WTWS. There was a perception that probably exists today amongst some of the users, that the system over warns and provides incorrect information. As far as possible, each of the issues have been addressed by the WTWS WG and the results show that the overall probability of detection (POD) has increased, whilst the false alarm rate (FAR) has been reduced.

We produced, in many cases jointly, an extensive amount of educational and briefing material, including a "Booklet" which is now into its 3rd edition, a number of articles in international and local aviation magazines, including excellent contributions in "Flyleaf" [the magazine for (the Cathay Pacific) Aircrew Officer Association] by CM Shun (now the director), PW Chan and PW Li on the development and enhancement of the windshear and turbulence warning service at the HKIA.

Pilot Reports and Flight Data Monitoring

Despite some doubters, the education process did succeed, as was demonstrated by the filing of pilots' reports and the return of survey questionnaires. These were essential means of verifying that wind shear and/or turbulence is present. It is just as important to report when it is forecast/alerted and not there, as when it is a confirming its presence. I cannot emphasise how important this was to enable us achieve our overall aim of improving the POD and reducing the FAR.

I was also able, as the Association's representative to write and have agreed a variation to the CX/AOA Flight Data Monitoring agreement that allowed the HKO to use the FDM

(Flight Data Management) data to help verify the performance of the WTWS by comparing the aircraft recorded data with the alerts from the system. I also helped with some of the analysis as the Airbus Fleet FDM Team Leader.

World Beater

As I have stated previously, "The development of the windshear detection technique by the HKO is world beating technology and places Hong Kong as a centre of excellence within the aviation meteorological community."

In the Bulletin of the World Meteorological Organization, it was stated that "The warning of low-level windshear at the Hong Kong International Airport was delivered "using a combination of science, high-end technologies and user education".

IFALPA was instrumental in not only supporting the acquisition of the LIDARs, but also in helping to develop and fine tune their usage to provide alerts for pilots. In recognition of the Federation's role and of my personal involvement, since the project's inception, I was invited to attend the several official ceremonies along with Captain Mike Davis, who was chairman of the Hong Kong Civil Aviation Department's Windshear and Turbulence Warning System Working Group, until he left the HKCAD to join the private sector.

Summary

The WTWS will never be perfect. The transient nature of some of the events coupled with the limitation of elements of the system will always lead to some real or perceived "False Alarms". Nevertheless, the WTWS, as an overall system, does have a very high "Probability of Detection" and this is no small way due to the enhancements implemented by HKO in conjunction with the stakeholders. The WTWS WG was an extremely effective forum and it was with great disappointment that I learnt that the HKCAD had decided to dissolve it.

Liaison Group on Aviation Weather Services

I attended the first meeting of the Liaison Group on Aviation Meteorological Services (later renamed the Liaison Group on Aviation Weather Services [LGAWS]) in 1993. [One question I never was able to answer is why we keep changing names!] The director at that time was P Sham, who explained the objectives and then handed over to CY Lam. CY, apart from being a meteorologist, is a renowned ornithologist and is the co-author of the "Birds of Hong Kong", a book that I have used often in my attempt to identify a bird sighted on one of my hikes around the SAR. Robert Wong (Luthansa) was also a founding member on the Liaison Group on Aviation Weather Services and I believe that we were the longest serving members, though, since moving to Australia, Robert must now deserve that distinction on his own.

The LGAWS became a forum for the Observatory to display its wares and to showcase some of its new products and services. There was perhaps a little bit of skepticism from time to time with the "satisfaction surveys", but what is indisputable is the determination to enhance aviation weather services.

Over the 34 meetings that I attended, there have been a significant number of new products and services, including

a. Customized SIGWX charts with more "user friendly" access.
b. Upper air temperature charts for North Pole.
c. China composite radar image, using the China Meteorological Administration products.

d. Different SIGMETs will have different icon illustrating the source of the warning e.g. typhoons, volcanic ash etc.

e. Aerodrome landing minima chart, based on TAF, that makes it very easy to select alternatives; which can be tailored for airlines and can include crosswind and tailwind limits.

f. Local Met includes the ATIS (Automatic Terminal Information Service) on AMIDS (Aviation Meteorological Information Dissemination System) + web cam images at various locations.

g. A new product of Tropical Cyclone/Strong Monsoon Signal showing an icon on the AMIDS, which can then be clicked for further information. A number of additional icons were developed, including one for lightning warnings.

h. Introduction of broadband internet access to replace “dial up” access.

i. “What’s New?” page placed on the AMIDS.

j. SMS (mobile service - short message service)

k. The developments and enhancements to the WTWS.

The Commission for Aeronautical Meteorology (CAeM)

The 14th Session of the World Meteorological Organization’s Commission for Aeronautical Meteorology (CAeM) was held in Hong Kong, China, from February 3rd to 10th, 2010. As I was living in Hong Kong, I was asked by IFALPA to attend, along with Lucy Tsui (HKALPA Techncial Secretary) as the official Federation’s representatives. The CAeM meets every four years normally in Montreal or Geneva, so it was a real honour for the HKO to host it in Hong Kong.

As the organizer of the 1994 IFALPA Annual Conference held in Hong Kong, I understand the scale of task required to make a major international event successful. The HKO achieved this and witnessed first-hand by the positive feedback from "Met experts", who came from all over the world.

Sometimes conferences are "talk fests". This was not one of them; it was a serious technical conference in which many important issues affecting the provision of aviation weather services were discussed. There is a difficult "marriage" at times between meeting the requirements of the WMO, which sets the standards for forecasters, training and Met offices in general, and ICAO, which sets out the Standards and Recommended Practices (SARPS) for aviation.

In some ways, Hong Kong "punches above its weight", but it also supports its big brother "China" by providing the international expertise and "savoir-faire". This was reflected in the number of HKO personnel that were appointed or elected to the various task forces, as well as to the presentations made by them on "TAF Validation" and other topics. Of course, the highlight was the election of CM Shun as the new CAeM president. I was pleased to make the following statement in plenary:

"Mr President, I would ask your indulgence, so that I may make a brief statement on behalf of IFALPA.

IFALPA would like to congratulate Mr CM Shun on his election as chair of the Commission for Aeronautical Meteorology. In congratulating Mr Shun, IFALPA would like to *acknowledge the outstanding contribution made by the retiring chairman, Mr Carr McLeod, especially in his endeavours to make aviation meteorological services more efficient and effective both during his time, as president, and in his legacy, as evidenced by the strategic plan and by the development of the New Terminal Forecast.*

If I may remove my IFALPA hat for a moment, I would like to say that as a permanent resident of the Hong Kong Special Administrative Region of the People's Republic of China, I am extremely proud to see someone from the Hong Kong Observatory be elected to this prestigious and important post. On an individual note, I have worked closely with CM over many years and admire him professionally and like him personally.

In electing Mr CM Shun, you as members of the Commission have shown wisdom in selecting a person that has the tact and diplomacy, as well as the resolve to lead the Commission, with the support of the management group and you, the members, through (and I will not say "interesting times", as this is a Chinese curse), rather challenging and innovative times.

I have been extremely impressed by the presentations, discussions and papers that have been presented at this meeting; and by the level of the intellectual, scientific and pragmatic debates that have taken place. I never thought that I would say it; but I have actually enjoyed listening to proceedings on aviation meteorological topics.

Although there are a few days to go, I would like to wish you all a Happy and Prosperous Year of the Tiger; this is an especially important year for me, as I am a Tiger, as is the

CAeM having also been "born" in 1950. For those of you, who are also tigers, let me tell you that the forecast for us is extremely good with mostly CAVOK conditions (if I may still use that terminology) and very few SIGMETs on the horizon (where they are still issued).

Kung Hei Fat Choi!

Thank you!"

The Future

I emigrated to Australia in 2011 and am now a permanent resident, though I also return to Hong Kong on a fairly regular basis, as I still have many friends and business interests there. More especially, after 24 years, it still feels like home. What expertise and knowledge I now possess in terms of aviation meteorology, over and above that learnt as pilot, is directly attributable to the HKO and from the IFALPA "Met experts" in the ATS Committee. I am glad that I am still able to use this in my discussions with the Australian Bureau of Meteorology and participation in its aviation industry groups.

Summary

I have worked with the director, CM Shun and his colleagues for over 20 years and have a great deal of respect for them, both as meteorologists and as people intent on providing the best service for the airport users.

It has been a privilege to collaborate on a number of major projects. Let me just end my essay by thanking CM and all of you in the HKO, on behalf of the pilots, for your efforts in helping to make our job safer and more efficient.

從手動到自動、從無到有，見證着氣象的發展

馮瑞權，澳門地球物理暨氣象局局長
Fong Soi-kun, Director of Macao Meteorological and Geophysical Bureau

Dr. Fong Soi Kun, Director of Macao Meteorological and Geophysical Bureau, congratulates the 130th anniversary of the Hong Kong Observatory (HKO) and the 25th anniversary of the Hong Kong Meteorological Society, both taking place in 2013. He recalls his personal experience during his meteorological career in the past three decades, witnessing the evolution of meteorological monitoring instruments, advancement of weather analysis and forecasting as well as improvement of weather services in the region.

今年是香港天文台成立一百三十週年，我這位從八十年代初投身氣象行業的人員，被邀請為這本紀念刊物寫一篇稿，實感榮幸。回想起我在氣象行業中已經三十多年，但相比起香港的氣象歷史只是一瞬間的事情，而我所經歷的亦只是近代的氣象發展狀況，談不上氣象歷史的回顧，同時也只是我個人在澳門氣象局中所體會到的一些經歷。

從手動到自動、從無到有，見證着氣象的發展

在三十年前的一個春節後，我進入氣象局當學員，那時我對局內的各種儀器都帶著濃厚的興趣，例如放在觀測坪上的各種儀表需要每小時進行觀察；在通訊室內放置的無線電傳真機，不停地接收和打印著各地傳來的天氣訊息，偶然由於天氣的變化通訊受影響，還需要聽摩斯碼把訊息翻譯出來；在預報室內同事和我都在忙於填圖和畫圖，所有的天氣預報均是基於這些天氣圖進行主觀分析和預報的。而我最感興趣的是放在天台的日照儀，在外型上它除了是一個又圓又大的水晶球外，還能夠把日照時間在紙條上留下痕跡。

現時在觀測坪上偶然還能看到這些儀表，常被稱為傳統儀器，現在取而代之的是全自動的氣象觀測站。在通訊室內的變化更為明顯，過去室內聽到急速嘈雜的打字聲，現已變得一片寧靜。那些舊式傳真機都消失了，換上的是各種電腦和通訊網絡。

在預報室中更起了根本上的改變。以往所有的預報均是基於人手所畫的天氣圖，它們只代表著過去的天氣狀況，而預報工作只能全憑經驗去進行。現時，預報室中均設有各個預報中心的數值預報模式產品，預報時效有些多達七天以上，可為預報員作為參考。

此外，在遙測技術上也取得重大的進步。氣象局從1985 年開始在本區接收靜止氣象衛星的雲圖，隨著時代的進步，陸陸續續出現了天氣雷達、風廓線儀等設備，促使氣象預報得到長足的發展。

天文台台長岑智明(左三)、澳門地球物理暨氣象局局長馮瑞權(右三)與雙方其他代表討論加強合作交流

正值香港天文台成立一百三十年和香港氣象學會成立25 年之際，本人謹對香港天文台和香港氣象學會所取得的豐碩成果作出熱烈的祝賀，並代表澳門氣象局全體仝人祝願香港同行在未來取得更大的發展，事業蒸蒸日上！

專訪漁業界前輩 - 姜彥文先生

李國麟
Lee Kwok-lun

Mr. KL Lee, Scientific Officer, visited Mr. Keung Yin-man, President of the Hong Kong Fishery Alliance. As a fisherman for most of his life, Mr. Keung appreciates the importance of weather to the safety and livelihood of the fishing community. He shares with us his interest in the weather and the wisdom of traditional Chinese sayings in predicting the weather. He also treasures the weather services for fishermen provided by the Hong Kong Observatory which greatly facilitate their fishing operations and route planning.

踏進香港仔香港漁業聯盟的會址，便看見一位精神奕奕的老人家姜彥文先生（人稱姜叔）在歡迎著我們。會址的牆壁上，掛滿的盡是嘉許狀，以及姜叔在接受嘉許時與高官名人的合照，標誌著這位一生服務漁業界的老前輩所獲得的認同。

年屆 70 多歲的姜叔不單是「香港漁業聯盟」和「香港漁業總商會」的主席，同時還擔任歷屆「港九水上漁民福利促進會」的理事長。由於姜叔是漁業界的主要代表，故多年來與天文台關係密切，他及其屬會給予天文台許多寶貴的意見，讓我們更能為香港漁民提供切合海上作業的天氣資訊。

原藉山東的姜叔是來自漁民家庭，他自小便跟著家人出海，除了學會捕魚技術外，他最感興趣的就是跟長輩學習觀察天象來預測天氣。他表示準確的天氣預測對漁民來説是非常重要，因為天氣好壞除了影響漁獲外，更會直接影響漁民的生命安全。姜叔憶述昔日還並沒有先進儀器及通訊科技，漁民主要靠自己的經驗，觀天象及參考船上簡單的水銀針（按：氣壓計），再配合《通勝》來預測天氣及潮汐漲退情況。

每當談到天氣，姜叔就會興奮起來，對歷代漁民祖先流傳下來的預報口訣更琅琅上口，例如“天上鯉魚雲，地上起泥塵”、“北閃晚南風，西閃日頭紅，南閃雨重重，東閃打大風”、“初三、十八，有流盡發；初八、廿三，晏晝流返”等等，還有其他口訣未能一一盡錄。漁民利用這些口訣，憑著對天色，雲量雲種、風向風勢、閃電情況及水流等觀察，來預測天氣概況及趨勢。姜叔現在仍常把這些口訣掛在咀邊，希望與年青一輩的漁民，甚至其他朋友分享他的經驗及親身經歷，然而現代的漁民大都倚靠天文台發出的天氣預報及天氣資訊，懂得運用這些傳統口訣的人已越來越少。

姜叔説雖然今天已很少人會以傳統口訣來預測天氣，但天文台適時提供給漁民的天氣預報及資訊，對海上作業的漁民在策劃航程，或預算何時回港避風等行動上，有著莫大的幫助。他強調天氣是漁民最切身的問題，準確的天氣預報能保障他們的生命及財產。姜叔表示十分尊敬天文台的工作，他冀望天文台與漁民能有更多的溝通，為漁民提供更合適的天氣服務。

姜叔在示範如何以漁民傳統智慧預報天氣

亦師亦友

Friends and Advisors

130 有緣相聚

Under the same sky

我參與的
香港天文台培訓教學

丁一匯教授
Professor Ding Yi-hui

Professor Ding is the special consultant of the China Meteorological Administration on Climate Change and an Academician of the Chinese Academy of Engineering. He is a world renowned scientist and has made important contributions in many international programmes and organizations, including the past four Assessment Reports of the Intergovernmental Panel on Climate Change (IPCC). Professor Ding is currently a scientific advisor of the Observatory and his long association with the Observatory dates back to the early 1980s. In this article, Professor Ding recalls conducting specialized training courses three times over the years for Observatory colleagues, on tropical cyclones, climate forecasting and climate change respectively. The training interactions provided also the opportunity for developing friendship and cooperation with the Observatory.

1981 年底，我作為訪問學者從美國歸來途經香港，天文台安排我做了一個關於颱風研究的報告，這成為我對香港天文台的第一次訪問。報告地點就在圖書館內的一個小會議室。那時天文台的工作語言是英文，所以我的報告也用英文。抵港當晚，當時的天文台台長 Peacock 先生和助理台長岑柏（Patrick Sham）先生在老美麗華酒店宴請了我。席間，他們告之，快將迎來香港天文台建台100 周年，希望我能參加他們的慶祝會和學術報告會。我欣然同意。及至1983 年，我在香港天文台的百年盛會上報告了我在美國 2 年訪問期間的部分研究成果，闡述了西太平洋多颱風和少颱風大氣環流條件和能量收支的不同。會議期間，署理天文台台長岑柏先生、李忠琛助理台長和林超英高級科學主任邀請我與陶詩言先生來港為天文台的同事授課。我當即首肯。

1985 年1 月，我與陶先生如約來到香港天文台，岑柏台長、李忠琛助理台長和林超英高級科學主任為我們舉行了歡迎晚宴。席間，我們得知過去天文台的培訓工作都是在英國進行的，一般數月，也有長達1-2 年的。但今後將多邀請國內專家來港授課。過去在英國的培訓，主要學習一般原理和方法，個例和實習內容大多是歐洲的，現在請國內學者授課可直接結合中國實際，更有實用價值。這樣，我和陶先生就成為首次參與天文台職工培訓教學的國內專家。我被邀請講授颱風，陶先生則講授暴雨。我想，這可能與我們在國內出版的兩本書有關。一本是我與陳聯壽合著的《西太平洋颱風概論》，一本是陶先生主編的《中國暴雨》。兩本書均由中國科學出版社出版，他們肯定會看到的。課程的安排，除週六、日外，我們每天各講課一小時，全台人員除值班外都來聽課。講課地點就在新建大樓的多功能廳。講課之餘，我們隨時回答問題外，主要是備課。那時，所講內容和圖都要畫在透明膠版上。我不僅按《西太平洋概論》的主要內容講解了颱風生

成、發展路徑、強度變化、影響、預報，還專門增加了我在美國2 年對颱風氣候學的研究成果，如颱風的時空群發性，與亞洲季風的關係，颱風變性和結構等內容。陶先生對暴雨的講解也十分全面。他根據過去50 年影響中國暴雨的歷史個例，如1931、1935 及1954 年長江特大暴雨洪水分析闡述了暴雨形成的大尺度、中尺度條件，暴雨落區預報，以及重大暴雨事件的影響等。

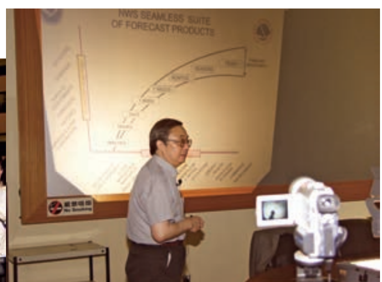
在這之前，香港天文台的培訓是用英文講授，這一次，天文台提出，如果我們願意，可以用中文講授。我們欣然同意，因為這樣既方便又有效率。開頭幾課，由於我的地方口音不重，絕大部分天文台同仁都聽懂了，反映還不錯。陶先生則因南方口音較重，聽起來有些困難。他於是放慢速度，果然效果大有改善。

當時負責業務培訓的是梁榮武、甄榮磊兩位先生，他們精心安排了我們的生活。開始，我們住美麗華酒店，一日三餐也在那裏。後來我們要求更換到老美麗華酒店，那裏住宿便宜許多，中午與天文台同事們同吃外送的午餐，只有 8 元港幣。那時大陸學者的工資還不高，如此安排，我們既節約了開支，又可以利用午餐時間和香港天文台的同事們一起聊天。當時岑台長和林高級科學主任也在食堂一起用便餐，大家十分融洽。

春節前，我們完成了長達一個月的培訓任務，也瞭解了天文台的業務情況，更與天文台的同仁們結下了長久的友誼。如今，雖大部分同仁已經退休，但仍有書信往來，偶有見面十分親切。

第二次培訓是在 2001 年初夏，香港天文台為了建立氣候預報業務（過去天文台只有天氣業務），邀請我用一周的時間為天文台同仁們講授氣候預測問題。當時，香港天文台尚未建立動力氣候模式，需要瞭解採取什麼樣的模式系統（特別是區域氣候模式），來做香港的氣候預測。我重點講了 ENSO 事件以及預報應

用，對中國的影響，以及颱風的氣候預報，還特別重點講解了利用區域氣候模式製作月、季氣候預報問題。由於香港面積有限，重點是建立自己的區域氣候模式，邊界則用其他全球模式的輸出。這一次的聽眾主要是將成立的氣候組同仁以及有關的同事，香港有關院校的師生也參加了旁聽。我一般上午講 2 小時，提問半小時，下午則與氣候小組的張文瀾先生、許大偉先生、沈潔瑩小姐等專門討論具體問題，特別是模式的構建、運行和資料等問題。那時天文台的業務在擴展，對氣候變化問題也開始關注。氣候小組的同仁們對香港當地溫度和降水等變化進行了分析，並將結果做了報告。當時我對香港的氣候狀況有兩點深刻印象：一是香港的百年以上曲線表明增溫也是明顯的，二是城市化的影響。香港的熱島效應很明顯，約佔整個升溫的 30% 左右（國內主要城市佔 20-25% 之間）。通過這次講課，天文台決定採用 NCEP 全球模式與 Scripps 海洋研究所的區域氣候模式嵌套運算，輸出香港地區的預報結果，通過回報和預報試驗效果還不錯。我記得這一成果由張文瀾先生等發表在 WMO 一次相關會議的文集中。



丁一匯教授（右圖）於 2001 年在天文台（左圖）講授氣候預測

隨著氣候變化問題日益引起政府、科技界和公眾的關注，2009 年 2 月香港天文台為開展這方面的研究和業務，以及瞭解國內外進展，邀請我為天文台做一周的講授，並在香港科學館安排了一次科普講座。這次與我一同赴港交流的還有國家氣候中心的孫穎博士和張錦女士。

天文台對這次交流活動作了精心安排。14 日上午，我在香港科學館作了“地球氣候的過去、現在和未來”科普演講，香港各界公眾前往聽講。會後，一些熱心聽眾發來電子郵件，與我討論或請教相關問題。曾多次訪問國家氣候中心的香港天文台退休高級科學主任張文瀾先生邀請我們到家中做客，共敘友情。

這次培訓，共安排了 7 個講座。每日上、下午各 3 小時。內容包括：全球氣候系統；氣候動力學；氣候預測：包括原理和方法，集合氣候預報系統，以及將來的改進；氣候變化：包括觀測事實，預測和對策。除香港天文台的專家外，來自澳門地球物理和氣象局以及港澳幾所大學的師生也前往聽講。學員反映，講座深入淺出，十分實用。不少同仁表示聽此講座收穫很大，解決了他們在工作中多年沒有弄清的問題。我精心準備了這次講座，除科普報告和 7 個講座的 PPT 外，還準備了 5 個附錄，提供了一篇近三萬字的問題解答，回答了全球氣候變化的一些重要問題。在我的講座之後，天文台同行們也做了學術報告，我們共同討論。我回答了天文台同行們提出的許多關於區域氣候模式以及氣候變化研究問題。第二天一早就要離開，當晚 12 點，高級科學主任甄榮磊先生還打電話與我討論。天文台同行們的敬業精神和嚴謹態度令我與同行的兩位同事十分感動。

丁一匯教授於 2009 年在天文台講學

在港期間，每天均有天文台同事熱情宴請。林超英台長專門與我討論了氣候變化的不確定性與香港目前開展氣候預測的途徑。我建議：從防災減災入手，關注氣候變化和香港地區的氣候預測，發展一套大城市的無縫隙細化預報系統。那時，林台長即將退休，但他表示一定會繼續促進中國氣象局與香港天文台的良好合作關係。

3 次赴港講課，給我留下深刻印象。通過科學研究和業務經驗的交流，大陸專家和香港天文台的同仁們相互促進，達到了共同發展的目標。教與學是相長的，我從中也學到了許多有用的知識，接觸了許多先進技術，香港同仁們也借此機會瞭解了大陸學者的工作和能力。作為祖國的一家人，我們進一步加深了親密的友誼。

香港回歸後，天文台的大部分培訓均安排在國內，除邀請大陸學者赴港講學外，不少專家也來到清華大學、科學院大氣所和南京資訊工程大學等院校和科研機構參加培訓，這些培訓同樣收到甚至超過了過去在歐美培訓的效果。2003 年在香港天文台成立 120 周年之際，我與劉家銘、吳國雄、張智北和劉雅章四位同事獲得“國際華人學者”榮譽稱號。2005 年林超英台長聘請我擔任天文台科學顧問，任期 5 年（2008-2013 年）。我欣然接受，同時深感貢獻甚少，希望能為香港天文台做更多的事情。

台長林超英(左)於 2003 年在傑出氣象者科普講座專輯後向丁一匯教授(右)致送紀念品

在回顧天文台培訓活動之際，我也懷著深切的感激之情想起了香港同仁們對我、對大陸科學工作的支持，想起了他們傑出的工作和貢獻。香港天文台的颱風預報水平很高，在國內外享有盛譽。除美國關島外，凡預報西太平洋颱風，大多參考香港天文台的預報。更難忘的是1997 年6 月為了組織南海季風試驗，香港天文台特別安排召開了南海季風試驗國際科學委員會會議，詳細討論各參與國的科學計畫和安排。1998 年，在天文台幫助下Richard Johnson 教授在香港科技大學建立了南海季風試驗分中心，天文台也承擔了試驗中雷達和探空、自動站的加密觀測。試驗期間，香港天文台的同行們還利用實驗3 號科考船的中途補給和停港期間進行專門的科普宣傳和參觀活動。這些活動使第一次由中國科學家主持的大型氣象科學試驗產生了重要影響。

香港情緣

王才芳
Wang Cai-fang

Mr. Wang Cai Fang, Executive Deputy Director of the WMO Nanjing Regional Training Center, recalls his close partnership with HKO during his career in international meteorological cooperation in the past 40 years, including the establishment of the automatic weather station at Huangmao Zhou in the early 1980s, which was the first station jointly set up by the Mainland and Hong Kong. Mr. Wang treasures the friendship developed with various directors and staff of the Observatory and the close cooperation in the international meteorological arena.

1972 年世界氣象組織恢復中華人民共和國在世界氣象組織的合法席位後不久，我從中央氣象局研究所調入外事部門長期從事國際氣象合作工作。2001 年3 月赴日內瓦世界氣象組織(WMO)秘書處任高級外部關係官至 2009 年 6 月退休。回國後又在世界氣象組織南京區域培訓中心工作三年。在近 40 年的國際氣象合作事務中，我與香港天文台歷屆台長，尤其是岑柏、劉志鈞、林鴻鋆、林超英、李本瀅和岑智明及許多同事結下了深厚的友誼和情感。

1975 年 9 月我首次隨時任中央氣象局負責人鄒競蒙出席在斯里蘭卡舉行的世界氣象組織第二（亞洲）區協屆會。我與同事在屆會前首先參加了區協氣象通訊工作組會議。該工作組會議是中國恢復席位後的首次亞洲工作組會議。我們對該工作組會議的歷史、程式及要討論議題等知之甚少。與會的香港天文台科學主任崔家聲先生給了我很多幫助和指導。隨後幾年又多次在國際會議和建立北京—香港氣象電路過程中與崔先生又常見面。有趣的是，若干年後崔先生在澳大利亞氣象局又擔任了外事主管，我倆又在一起參與雙邊和國際事務中共事數十年直至 2008 年崔先生退休。

1978 年 3 月，我赴新加坡出席了 WMO 二 / 五區協氣象通訊協調會議後在香港作短暫停留。此時正巧由中國科學院陶詩言院士、王世平、周秀驥組成的中國氣象代表團出席在菲律賓召開的 WMO 大氣科學委員會屆會後也在香港停留，並有幸與陶先生等受香港出席 WMO 大氣科學委員會屆會的林超英先生的邀請訪問香港天文台。該次訪問香港天文台給我留下了極其深刻的印象，印象更深的是林超英先生解釋取名超英“超越英國”的壯志雄心深感欽佩。在隨後的三十年中，我與小林會見次數甚多，尤其是在他擔任 WMO 亞洲區協副主席期間，在國際事務中互助支援配

合尤為默契，除工作關係外，私人交往也深猶如兄弟。小林台長 2009 年退休之際，我曾寫打油詩：

相識三十載，情誼深似海。

觀雲測天同奉獻，信譽朋友滿五洲。

心寬體健養天年，休閒觀鳥游四海。

不是神仙，勝似神仙。

上世紀 80 年代初，香港天文台為提高天氣預報水平計劃在廣東黃茅洲島建立自動氣象站。這是第一個內地與香港合作建立的氣象站。因該地涉及軍事管轄，需經中央軍委審核批准。經近兩年的努力，廣東軍區和總參謀部批准在該島建立自動氣象站。經中國氣象局、廣東省氣象局與香港天文台商定，雙方將派員登島實地考察。由中國海軍提供軍艦。1983 年，我有幸作為中國氣象局代表赴廣東珠海與香港天文台代表李忠深、林鴻鋆先生進一步商討合作和上島事宜（內地參加的還有時任廣東省氣象局張延松副局長，辦公室及珠海氣象局人員）。我們一大早乘海軍炮艇約 3 小時抵達黃茅洲島。該島滿島長著一人多高的野草，沒有道路可走，全憑我們自己找路上去，上山異常艱難，最早登上島頂的約花 40 分鐘。大家到頂後，心情異常激動，這也許是中國人第一次登上該島。上面有一塊相對較大較為平整的土地。雙方一致認為很適合自動站的安裝，並照了些照片，下島後於傍晚回到珠海。隨後兩天雙方就土地平整、申請直升機登島的一系列事宜進行了逐項討論。該自動氣象站的建立，為提高天氣預報起了非常重要的作用。回想這次登島之事尤感欣慰，如有條件期待再上島看看。

上世紀 80 年代中至 90 年代末，在參與颱風委員會的活動中，尤其是在颱風委員會關於颱風業務試驗和轉向試驗期間，

與岑柏、劉志鈞和林鴻鋆台長接觸甚多，從而加強了內地與香港在災害天氣方面的合作與支持，受益匪淺。特別要提及的是林超英在1997 年代表香港天文台在屆會上提出颱風的命名應使用亞太地區特色的名字命名代替過去由美國軍方為西北太平洋颱風命名，這一提議得到颱風委員會全體成員的積極支持，改變並創造了歷史。

1998 年5 月我隨温克剛局長以中國氣象學會訪問台灣之際途經香港，對天文台進行了訪問，此時正值香港新機場啟用前夕，我們參觀了機場航空氣象中心，此先進的設施及預報人員的敬業精神留下了深刻的印象。至今，香港天文台台長岑智明先生擔任世界氣象組織航空氣象學委員會主席，在國際航空氣象界發揮了重要作用，充分體現了香港天文台航空氣象的業績和在國際航空氣象界的影響。

2004 年12 月，世界氣象組織第二（亞洲）區協屆會在香港舉行，林超英擔任區協副主席。我有幸作為 WMO 高級外部關係官陪同秘書長雅羅先生訪問香港參加屆會開幕儀式並訪問香港天文台，尤其是參加了由香港天文台承辦的世界氣象組織天氣資訊服務網提供全球第1000 個城市天氣預報的慶典活動。至今該網站已為全球約170 個會員提供了超過1600 個城市的天氣預報和氣候資訊。該網站及全球災害天氣網已為全球可持續發展作出了重大貢獻。該網站在全球及各地區的認可和獲得的許多殊榮，體現了國際社會對香港天文台工作的認可。此外，香港天文台多屆台長，如瓦特士[1]、岑柏、林鴻鋆和林超英均曾擔任過世界氣象組織第二（亞洲）區協副主席，為亞洲區協的氣象事業及本地區社會穩定和經濟的發展作出了較大貢獻。

[1] *Dr. Ian Edward Mein Watts, 皇家香港天文台台長 1956-1965 年*

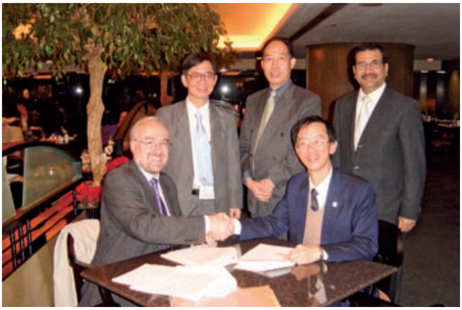
2009 年 6 月從 WMO 退休後，我開始在世界氣象組織南京區域培訓中心工作，再次與香港天文台結緣。實際上，香港天文台從上世紀 90 年代中就不斷派員來該中心進行數月的氣象預報員專業培訓和參加其他國際氣象培訓課程，這些學員刻苦認真的學習精神給我留下了深刻的印象。尤其是在近幾年，我中心的多項培訓工作得到了香港天文台的大力支持，特別是派資深專家來我中心授課，如 2010、2011 年來該中心講學的就有李本瀅台長，林鄺泗蓮和梁榮武二位助理台長，以及彭志健先生等高級專家，為提高該中心的培訓質量作出了貢獻。2012 年，因澳門氣象局邀請，該中心派教員赴葡語國家，諸如莫桑別克、佛得角和東帝汶等國進行航空氣象培訓。在這方面，又得到了岑智明台長、劉心怡助理台長的大力協助和支持。在此，我謹代表 WMO 南京區域培訓中心對香港天文台多年來對南京區域培訓中心的支援再次表示衷心的感謝！

值此香港天文台 130 周年台慶之際，謹以此文祝賀香港天文台長期以來取得的卓越成就及對香港社會乃至亞洲及全球可持續發展所做出的傑出貢獻。衷心祝願香港天文台未來做得更好，更高，更強！為香港的持續發展及國際氣象事業作出更大貢獻！

1978 年 3 月訪問香港天文台與台領導合影 (鍾國棟台長 (中間)、費愨副台長 (右四)、岑柏 (右三)、林超英 (左一) 、王才芳 (右一))

1983 年在黃茅洲的合影 (林鴻鋆（左一）、李忠深（左三）、王才芳（右一））

1998 年 5 月隨温克剛局長順訪香港天文台 (温克剛局長 (前排左二)、林鴻鋆台長 (前排右二)、林超英 (前排左一)、王才芳 (後排左一))



2004 年12 月 WMO 秘書長雅羅 (前排左) 與天文台台長林超英 (前排右) 在二區協屆會前簽署舉辦屆會協定 (第二排中：王才芳)

2010 年 5 月香港天文台台長李本瀅博士 (前排中) 應邀為南京區域培訓中心授課和與部分學員在晚宴上合影 (前排右 : 王才芳)

My Close-to-Four-Decades Association with the Observatory

陳仲良教授
Professor Chan Chung-leung, Johnny

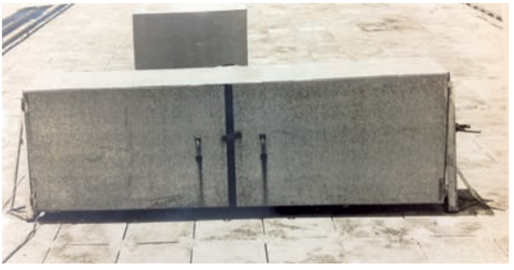
陳仲良教授還在研究生時期，初遇兼任大專院校科研合作項目顧問的天文台台長鍾國棟（Gordon Bell），他坦承鍾國棟台長是他在氣象學的啟蒙老師，而他的碩士論文實驗，亦在天文台進行。陳教授於1986年加入天文台服務市民，數年後他屬意多作學術研究，投向大專院校作育英才。多年來陳教授和天文台同事的科研合作無間，並獲邀請出任天文台策略諮詢委員。陳教授現任香港城市大學能源及環境學院院長，成就斐然。

Days with Mr. Gordon Bell

In May 1974, the Physics Department, University of Hong Kong, organized a seminar for its students graduating that year on possible topics for studying the Master of Philosophy or Doctor of Philosophy and I was one of them. During the seminar, each of the professors of the department presented their research topics but none aroused my interest. Then, a gentleman with grey curly hair, who was obviously not one of our professors, stepped to the front of the room and introduced himself and his topics. He was Mr. Gordon Bell, the Director of the Royal Observatory Hong Kong (ROHK), and Mr. Bell said that he had a joint project with the Physics Department on measuring the sizes of raindrops and finding their number distribution. That immediately triggered my interest. He then explained the importance of such distribution as its relationship with the radar echoes could give an estimate of the rainfall. This was absolutely fascinating to me and signed on almost immediately.

This encounter with Mr. Bell literally changed my life and I was initiated into the field of meteorology. For the next two years, I visited ROHK numerous times. In the beginning, Mr. Bell would take me to the radar room and explain to me how to interpret the radar pictures, and to the central forecasting office to tell me all about weather forecasting. He also taught me basic meteorology and took me to Tate's Cairn to see the radar site. In relation to the project, he enthusiastically showed me the pan of flour that he used to catch raindrops, the sieve that he used to measure the pellets of flour formed from the raindrops, and the pictures he took of the pellets. The distrometer (an instrument that measures raindrop size) that I designed was of a different kind, which was based on light scattering with the counting done by a spectral pulse-height analyzer.

After I had constructed the distrometer in the laboratory of the Physics Department and calibrated the signals, it was transported to ROHK and was put on the grass lawn outside the straw shed that today still houses the dry- and wet-bulb thermometers. The signal cable went from the distrometer to the little white stone hut near the back gate of ROHK and I had the data collection equipment inside the hut. This hut was where the earthquake charts were located and Mr. Peter Li and Mr. Lui Yau Lok were the two staff manning the place, so I became very well acquainted with them. In fact, both of them gave me lots of advice on the electronic instrumentation.



Photograph of distrometer device

On rainy days, I would go to the hut and took data, sometimes staying overnight, sleeping occasionally on a nylon bed. I remember also going to the radar room and watched the radar echoes of a tropical cyclone, with Mr. Bell explaining to me everything. I was really thrilled.

My two-year association with ROHK ended with the completion of my Master of Philosophy thesis and my subsequent pursuit of my Ph.D. in the US in August 1976.

I learned a great deal not only from Mr. Bell but from many colleagues of ROHK, including Mr. C Y Lam, who just started out as a Scientific Officer at the time. They taught me so much that I decided to take on the career as a meteorologist, which I have been since then.

I had only seen Mr. Bell once more in 1978 when I came back from the US in the summer. I told him I was going to move from studying cloud physics to doing research on tropical cyclones, and he strongly supported my move. It was unfortunate that he passed away soon after his retirement in 1981.

Days as a Scientific Officer

Since my student days with Mr. Bell, I had long aspired to be part of ROHK. So almost exactly ten years after I left ROHK, I returned from the US and joined ROHK as a Scientific Officer in April 1986. Because I have a Ph.D. in atmospheric science, I was told that I should know enough meteorology to begin forecasting duty. So my double-up period was a total of three days. I was then put right in the front line of operational forecasting, learning as I moved along. While I did know a bit about weather forecasting, none of it was operational, that is, with severe time constraints. Furthermore, my training was more on mid-latitude rather than tropical systems, especially those in East Asia. Characteristics of the Mei-Yu trough and cold surges were relatively new to me so the senior scientific officers at the time, including H K Lam, Fong Sai Wing, C Y Lam, Edwin Ginn, W M Leung, C M Tam, and others, all taught me a lot, especially on the empirical operational forecasting techniques. I am still grateful today to them for all the things they have taught me. This operational training helped me realize the limits of weather forecasting, which is useful in my subsequent research. I can also proudly tease those academics who spend their entire career in academia without putting themselves on the line that they really don't know what is going on in the real world!

Sixteen months later, I was transferred out of the Central Forecasting Office to the Tropical Cyclone Section, and worked under Mrs. Elaine Koo. This was great for me because I could spend more time on my favourite subject – tropical cyclone. Although my Senior Experimental Officer, Mr. K P Wong, did much of the analyses of past tracks, I had many enlightening discussions with him on some doubtful positions to come up with the "best tracks". Elaine was also great because she encouraged me and supported my initiative to do research on past cyclones, and I published a paper in Monthly Weather Review with Hilda Lam on the erratic track of Typhoon Wayne of 1986. Because the Tropical Cyclone Section was responsible for writing not only the Annual Tropical Cyclone Report of ROHK, we also had to write reports for the ESCAP/WMO Typhoon Committee Annual Tropical Cyclone Report. Both tasks forced me to understand the genesis, intensification and track of every tropical cyclone in the western North Pacific, which gave me great insights into these processes.

In July 1989, I got an offer from the City Polytechnic of Hong Kong as a Senior Lecturer to teach atmospheric physics. Mr. Patrick Sham, who was the ROHK Director at the time, tried to persuade me to stay. However, I reckoned that with my knowledge in meteorology, I could contribute more to Hong Kong by being an academic. So I left ROHK in October 1989, ending my second association with ROHK, during which I learned many things from my colleagues, some of whom have become good friends.

Two decades as an academic

Even though I left ROHK, I always feel that I am part of it. For the last two decades or so, I have visited ROHK/HKO numerous times, attending seminars of HKO and meetings of the Hong Kong Meteorological Society, meeting with Observatory colleagues to discuss collaboration between City University of Hong Kong and HKO, bringing students to visit the Observatory, etc. Every time I step back on the premises of the Observatory, I feel like I am going "home", to my once-stomping ground and one of the places that shaped me as what I am today. I am really honored to be bestowed the title "Distinguished Meteorologist of the Hong Kong Observatory" by the then Director, Mr. C Y Lam during the 120th anniversary of the Observatory. I am also grateful to be invited to the retirement parties of the last four Directors of HKO.

Professor Chan (left) receiving the certificate after a seminar from Lam Chiu-ying (right), Director of the Hong Kong Observatory

To conclude, the day in 1974 changed my life from being a potential physicist to a professional meteorologist, and I must express my sincere gratitude to Mr. Gordon Bell and all the Observatory colleagues, past and present, who have helped me all along. Without their support and encouragement, I would not have been what I am today. So thank you all and I wish the Observatory a great success in the years and decades to come. Happy 130th anniversary!

The Vampire Proposal of 1995

Dr. Neil Gordon

Neil Gordon 博士是航空氣象界的權威人士，於1988 年成為紐西蘭氣象局的高層管理人員。其後於1999 年至2006 年擔任世界氣象組織「航空氣象學委員會」(CAeM) 的主席。他自1995 年開始協助香港天文台策劃赤鱲角新機場的業務風切變警告系統， 提供非常專業和有遠見的建議及意見，其中他幽默地用「吸血殭屍」（VAMPIRE）來比喻無人飛機（UAV），預測將來怎樣可以利用這個新技術實時量度風切變數據。今天無人飛機的發展已成為趨勢，但可能仍需要經過多年的努力才能在風切變探測應用，可見Gordon 博士十多年前天馬行空的想法其實極具遠見。

In 1995 I had the honour of joining a three-member Panel of Independent Experts to provide independent advice on the Operational Windshear Warning System (OWWS), which was being developed for the new international airport at Chek Lap Kok (CLK). My position at the time was the General Manager (GM) National Weather Services for the Meteorological Service of New Zealand, and vice president of Commission for Aeronautical Meteorology (CAeM). The other two members of the Panel were John Kastelein from the Netherlands, a former president of CAeM, and Mike Eilts, at the time an Assistant Director at the US National Severe Storms Laboratory.

We reviewed copious material and spoke with many people. We were provided with excellent hospitality and cooperation by friends and colleagues from the Observatory and from Weather Information Technologies Inc. (WITI) in Boulder, Colorado, who were developing the system.

Our report was finalised and delivered during a visit to Hong Kong in October 1995. In general we concluded that " … good progress has been made on the substantial meteorological, feasibility and design issues …" and that " ..the development of the project should continue …" while taking into account some recommendations that we thought would enhance the success of the OWWS.

Subsequently, of course, the OWWS was successfully implemented at CLK, and the overall system was later enhanced by the addition of LIght Detection And Ranging (**LIDAR**) – an impressive world first for a real-time airport system implemented by a small team of the Observatory's scientists.

One of our recommendations was that additional in-situ data on turbulence from aircraft be obtained and used to both tune the system and to verify its performance. I referred to this at the time as providing “sky truth”.

After so much hard work on the review we couldn’t resist having a bit of fun, so I added an appendix to the report with a novel proposal for providing more “sky truth”. The proposal wasn’t pursued at the time, but, given rapid advances in unmanned aerial vehicle (UAV) technology, maybe something like this could be implemented in future? The proposal was as follows:

APPENDIX - VAMPIRE PROPOSAL

We propose that the Royal Observatory of Hong Kong (as the Hong Kong Observatory was known then) consider implementing an additional component for the Operational Windshear Warning System (OWWS), providing an infusion of particularly valuable data.

These data would come from instrumented pilotless aircraft flying continuous circuits with missed approaches into Chek Lap Kok. We call this component of the OWWS **V**elocity and **A**cceleration **M**easurements using **P**ilotless **I**nflights **R**outinely **E**xecuted, or **VAMPIRE**.

VAMPIRE would employ a new miniature aircraft being marketed by Bloodline Aviation of Transylvania - the BAT-11. This aircraft has a 3 m wingspan and a low-level cruise speed of 120 kt. It carries onboard sensors and an innovative Ultrasonic Positioning System (UPS). The BAT-11 can measure and automatically downlink continuous measurements of position, velocity, and acceleration, thereby providing in-situ data on wind, wind shear and turbulence intensity.

We suggest the continuous deployment of two BAT-11s, with each doing a complete circuit every ten minutes. This twopronged approach means that each point on the approach and departure corridors would be sampled on average every five minutes. We can imagine the scientists from WITI really getting their teeth into VAMPIRE data as a vital additional input for the OWWS.

There would, of course, be grave implications if there were an in-flight collision between the BAT-11 and another aircraft. Fortunately, the UPS is so accurate and the BAT-11 so manoeuvrable, that the BAT-11 has perfect collision avoidance, and can automatically interleave with the operational traffic.

The same systems allow the BAT-11 to conduct automatic in-flight refuelling and operate indefinitely. When running low on fuel, it is able to position itself just over the wing of an incoming 747, inject two very fine probes into the fuel tank, and extract sufficient fuel to allow it to continue operating. The holes from the probes are usually self-sealing, although there can be a small amount of fuel bleeding. The amount of fuel extracted is quite small, and should not be of concern to the airlines.

To date, the OWWS development has been lacking in nocturnal information. VAMPIRE would address this, with the BAT-11 flying both day and night. In fact, its unique characteristics mean that it operates best at night. In the daytime, sunshine can interfere with some of the delicate sensors. However, without sticking our necks out too far, we don’t believe this will be a problem.

The crux of the OWWS issue is to provide alerts which match pilot observations. With its unique capability for providing in-situ data, the implementation of VAMPIRE would be another nail in the coffin of those who doubt the feasibility of the OWWS. We would stake our reputation on the success of VAMPIRE, and urge its full-blooded implementation.

Glimpses of My Interactions with the Observatory in the Past Decades

劉雅章教授
Professor Lau Ngar-cheung

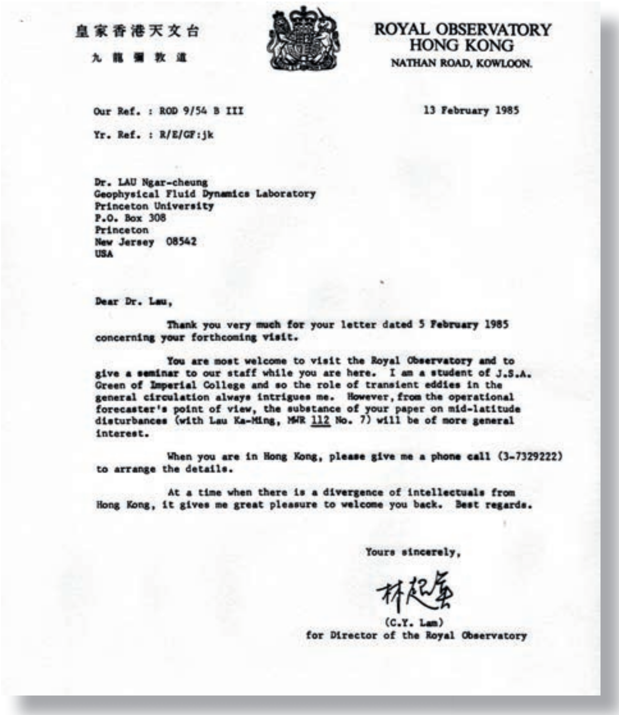
劉雅章教授是著名氣候科學家，現時是美國國家海洋大氣管理局地球物理流體動力學實驗室氣候分析計劃首席科學家，亦是普林斯頓大學教授。他的主要研究範圍包括大氣環流、熱帶環流系統、大尺度海氣相互作用和高分辨率氣候模式等多個領域。本文講述他與天文台幾近四十年源遠流長的往來，他連第一封「皇家香港天文台」發出的演講邀請函亦予以保存。劉雅章曾公開感謝香港給予他的教育機會和資源，他透過協力推動香港學術發展和科學普及，以回饋社會，天文台亦從中有所裨益。

My attention was first drawn to the work of the Observatory while I was a secondary school student in Hong Kong during the 1960s. At that time my school received regular mailings of an Observatory publication containing daily weather charts and various meteorological records for the Hong Kong region. I served as an officer of the Geography Club of the school, and was in charge of filing issues of this publication in their proper chronological order. In doing so, I noticed the day-to-day changes in the circulation patterns appearing in the weather charts, and tried to match such developments with the actual atmospheric conditions in Hong Kong on the corresponding dates. The most exciting events were, of course, associated with the approach of typhoons to our territory. I was fascinated by the crowded isobars surrounding the eye of these storms. Indeed, my decision to pursue a career in weather and climate research owes in no small part to this early exposure to meteorological data as depicted in those synoptic charts compiled by the Observatory.

My first 'official' contact with the Observatory dated back to 1974. I had just finished my course work at the Chinese University, and was admitted to the postgraduate program in atmospheric sciences at the University of Washington in Seattle. A few months before my departure from Hong Kong, I wrote a courtesy letter to the Observatory, in which I described my study plan, and also expressed my interest in serving Hong Kong society upon the completion of my academic training abroad. Since I did not know anyone at the Observatory at that time, I simply sent my letter to the attention of 'the Director', without expecting a reply. To my pleasant surprise, the Director had apparently passed on my letter to a senior member of his scientific staff, Dr. P.C. Chin, who in turn took the trouble of composing a friendly note to me. Dr. Chin wished me the best in my future endeavours, and asked me to keep in touch with the meteorological community in Hong Kong. Almost forty years later, I remain deeply grateful for these simple words of encouragement.

I concluded my thesis research work in 1978. After considering my intellectual interests and the opportunities available at that time, I have decided to follow an academic professional path focusing on research and teaching. I took a position at a climate research laboratory on the campus of Princeton University, and have stayed in this institution in the past 34 years. Despite this career choice, I still have strong yearnings to contribute whatever I can to meteorological research and education in Hong Kong. A few years after I settled down in Princeton, in early 1985, I took the initiative of sending a letter to C.Y. Lam, who was then a senior scientific officer at the Observatory. I offered to give a seminar presentation to the Observatory staff, so as to introduce my research interests, and to facilitate further discussions on possible future collaborations. C.Y. replied to my letter almost instantly, and extended to me a warm welcome to visit the Observatory in my next trip to Hong Kong (Fig. 1). This simple exchange of correspondence marks the beginning of my relationship with the Observatory lasting for almost thirty years.

For the first time in my life, I set foot on the grounds of the Observatory Headquarters on a spring day in 1985, to give a seminar summarizing my work on wintertime cold air outbreaks over East Asia. This inaugural visit was to be followed by many



皇家香港天文台
九龍彌敦道

ROYAL OBSERVATORY
HONG KONG
NATHAN ROAD, KOWLOON.

Our Ref. : ROD 9/54 B III

13 February 1985

Yr. Ref. : R/E/GF:jk

Dr. LAU Ngar-cheung
Geophysical Fluid Dynamics Laboratory
Princeton University
P.O. Box 308
Princeton
New Jersey 08542
USA

Dear Dr. Lau,

Thank you very much for your letter dated 5 February 1985 concerning your forthcoming visit.

You are most welcome to visit the Royal Observatory and to give a seminar to our staff while you are here. I am a student of J.S.A. Green of Imperial College and so the role of transient eddies in the general circulation always intrigues me. However, from the operational forecaster's point of view, the substance of your paper on mid-latitude disturbances (with Lau Ka-Ming, MWR 112 No. 7) will be of more general interest.

When you are in Hong Kong, please give me a phone call (3-7329222) to arrange the details.

At a time when there is a divergence of intellectuals from Hong Kong, it gives me great pleasure to welcome you back. Best regards.

Yours sincerely,

林超英

(C.Y. Lam)
for Director of the Royal Observatory

Fig. 1. Letter from C.Y. Lam inviting me to give a seminar at the Observatory. Note his practice of signing his letters in Chinese, and the efficiency with which he conducted his correspondence (our letters to each other were dated only 8 days apart).

more in the years to come. I returned to Hong Kong on an almost yearly basis, to see members of my family as well as close friends, and to participate in activities organized by local universities. I also frequently passed through Hong Kong on my way to various scientific meetings in East Asia, especially China and Taiwan. I invariably made an effort to spend some time at the Observatory during each of these stopovers. Such visits typically took the form of a presentation on a research topic in which I was actively engaged at the time (Fig. 2), followed by broad-ranging discussions with the staff on progress of different projects that are of high priority on the Observatory agenda. Of the many areas covered by such presentations and discussions, perhaps the most recurrent theme is the impact of El Niño and projected climate change on the weather and climate of Hong Kong. In the course of these scientific interactions, I was privileged to develop close and enduring friendships with many members of the Observatory staff, and to make acquaintance with a succession of very capable and far-sighted directors. I should also mention that, at each of my visit to the Observatory, my gracious hosts always treated me to a delightful lunch at various neighbourhood restaurants. I had thoroughly enjoyed both the conversation and the delicious food on such occasions.

Fig. 2. Seminar presentation to the Observatory staff on 3 October 2008. C.Y. Lam, the then Director, was seated at a back row just next to a door on the right. W.M. Leung was seated at the extreme right of the front row. Other members of the audience included assistant directors and scientific officers.

Beyond the seminars and discussions, I have served as a scientific advisor of the Observatory since 1996, and have offered assistance in the projection of temperature and precipitation trends in Hong Kong in the 21st century. My appointment as a scientific advisor had allowed me to observe the activities of the Observatory at close range. A particularly memorable experience in this regard is a study tour of the meteorological facilities at the new Chek Lap Kok airport. This tour was organized specifically for the scientific advisors by the Observatory in 1996, when the airport was still under active construction. We made our first stop at Tai Lam Chung, where a state-of-the-art doppler radar for detecting wind shear was being assembled. We then took a boat ride to the bustling airport construction site at Chek Lap Kok itself. The core structure of the new airport control tower was already erected at that time. We were taken to the floor level where all future aviation weather operations are to be conducted. Our stroll around the outer perimeter of the tower, at a considerable elevation above the ground level and with meager protective fencing available at that time, was quite nerve-wreaking, especially for someone with acrophobia like myself. Nonetheless, the visitors were rewarded with a bird’s eye view of a world-class airport taking shape at a frantic pace.

During the 1990s, I also had the opportunity of contributing to the Observatory through other channels. At that time, Professor Kenneth Young at the physics department of the Chinese University was interested in various meteorological problems with potential applications to local weather, such as atmospheric factors favouring the intrusion of cold air masses to southern China during winter, and the diurnal driving of the land-and sea-breeze circulation patterns in the Hong Kong region. Much of this research was conducted by several graduate students working under the supervision of Professor Young. I met three of these students—K.L. Lee, Y.C. Cheng and W.K. Wong—during my visits to Hong Kong, and discussed with them various scientific issues related to their projects. I also had the great fortune of serving as the external examiner for their M. Phil. dissertations. It is most gratifying to me that, upon their graduation from the Chinese University, all three budding meteorologists were offered appointments at the Observatory, and have remained as valued members of the Observatory staff up to the present day.

Another activity that I was engaged in during the past two decades has to do with the communication of knowledge on our changing climate system to the general public. At the invitation and encouragement of my former mentor at the Chinese University, Dr. F.C. Chen, I have composed several Chinese articles aimed at introducing various environmental issues to the general readership of a bimonthly publication named '21st Century'. Dr. Chen was a principal editor of this scholarly journal in its formative years, and a strong advocate for incorporating scientific knowledge as a critical component of Chinese culture. My essays were all written using non-technical language, and covered various topics ranging from global climate change and ozone hole to air-sea interaction and El Niño. The staff of the Observatory has played an active role in publishing the English version of some of these articles in the Bulletin of the Hong Kong Meteorological Society. The Observatory has also arranged for the inclusion of the Chinese version of these articles in its popular website (http://www.weather.gov.hk/education/edu01met/edu01_climatechange_e.htm). These gallant efforts were extremely helpful for informing the Hong Kong community of the current status of climate research.

My attempts to reach out to the public sector were given a tremendous boast in 2003, on the occasion of the 120th anniversary of the Observatory. In commemoration of this significant milestone, the Observatory has organized a series of popular scientific lectures at the Hong Kong Science Museum. I was deeply honoured to be asked to start this series with a talk on El Niño (Fig. 3). My principal contact person at the Observatory for this event, W.M. Leung, happens to be my fellow classmate at the physics department of the Chinese University in the 1970s. He has acquired a very good reputation as a weather announcer at local television stations. It was therefore tremendous fun collaborating with him after taking rather distinct career tracks in the preceding thirty years. As it turned out, the public interest in my talk exceeded my wildest dream. A long queue formed in front of the lecture hall long before the appointed hour. The 300-seat hall was filled to capacity, and the overflow crowd had to be accommodated in a nearby meeting room with live broadcast facilities. The audience (which included my former calculus teacher at secondary school, and former classmates at the Chinese University) was exceptionally attentive and engaging. Several young students stayed after the talk, and asked incisive questions on an individual basis. This experience has affirmed to me the eagerness of the general public in learning about cogent environmental issues, and the importance of knowledge transfer from the scientific community to the broader society. The enthusiasm shown by the audience at the Science Museum has motivated me to redouble my efforts to break out of the ivory tower of Princeton and to inform the public of the advances in climate science.

Fig. 3. Receiving a honourific certificate from Mr. K.H. Yeung, Assistant Director, on 18 October 2003, in the Science Museum auditorium, at the lecture celebrating the 120th anniversary of the Observatory.

At the conclusion of the 120th anniversary lecture series, W.M. has written an interesting article for the newsletter published by the 'Friends of the Observatory' (April 2004 issue), in which he shared reminiscences of his interactions with various guest speakers, including myself. At my request, W.M. has mailed a copy of this newsletter to my mother in Hong Kong. He was so kind as to attach a warm personal note describing our previous relationship as fellow classmates. Prior to this correspondence, my mother had already known W.M. through his appearances in numerous weather reports on television. She was therefore overjoyed at receiving a hand-written note from such a celebrity. To this day, she remains impressed by the fact that her son is a friend of this handsome 'Mr. Weather', and has sufficient 'clout' at the Observatory to arrange for a letter from a government official/television personality to be sent to her.

At this 130th anniversary of the Observatory, may I humbly offer my heartfelt appreciation and gratitude for the warmth and professionalism of its dedicated staff. Throughout the years, the Observatory has served as a hospitable base for my professional activities during numerous visits to Hong Kong. Its scientific personnel have selflessly shared with me their insights on the practical implications of my mostly academic pursuits. The Observatory has also offered me logistical and moral support for my efforts to popularize climate-related issues within the community in Hong Kong. Such generous provision of its institutional resources has always been made in a spirit of trust and cooperation, and with minimal administrative formalities. In many ways, I am indebted to the Observatory for nurturing and maintaining my roots in Hong Kong. It is my fervent wish that these roots will continue to run deep and strong in the future.

Air Ventilation Assessment at Tseung Kwan O

吳恩融教授
Professor Ng Yan-yung, Edward

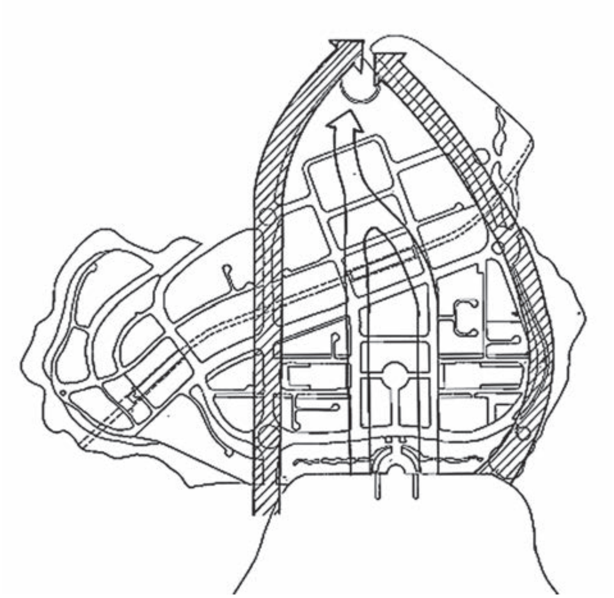
吳恩融教授是著名建築師，任教於香港中文大學建築學系。他的主要研究範圍包括城市氣候與規劃及環境與可持續設計。吳教授在文中談及香港政府在八十年代發展將軍澳為新市鎮的籌劃工作。由於當中涉及填海和城市規劃，天文台於一九八四年為該區進行了空氣流動的研究。其後，規劃顧問基於相關研究結果為將軍澳識別出兩條主風道和兩條副風道，令天然的風可以流進該區。天文台當年的氣象研究可說是規劃署近年積極推行的空氣流通評估系統的先驅。

Conceptualised in the 80s, Tseung Kwan O was planned as a new town by the then Territory Development Department of the Hong Kong Government to accommodate some four hundred thousand inhabitants.

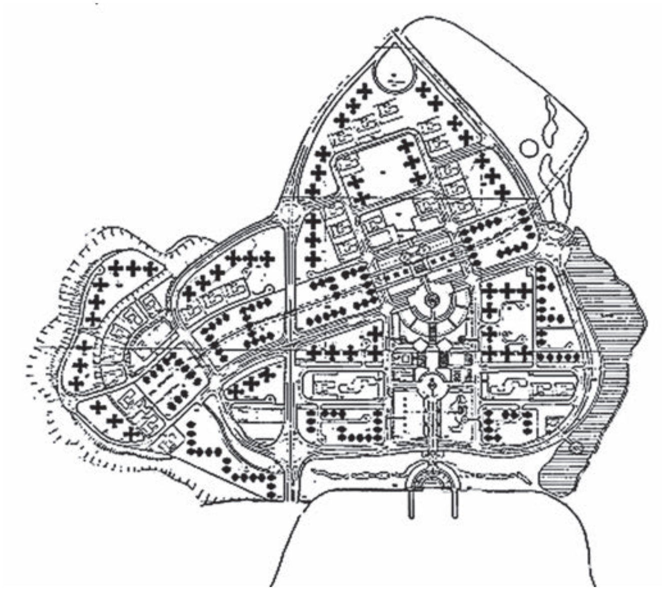
Due to the existing topographic constraints, land had to be reclaimed from the waterfront on the south to accommodate the new town. This increase the “urban thickness” (the distance wind needs to pass to reach from one side of the urban area to the other side) of the new town. As such, based on findings of the Final Report of Meteorological Studies of the Junk Bay Air Shed by the then Royal Observatory in 1984, the planning consultants of Tseung Kwan O incorporated two major and 2 minor breezeways into the plan. The report (dated 1990) of the planning consultant had this to say:

Breezeway

Two major breezeways of 100m wide, one along Road P2 and one along the town park and lakes, as well as a minor breezeway of 75m wide along the central pedestrian spine are provided to channel natural air flows such as valley winds, off slope and sea breezes and seasonal prevailing winds. Development within breezeways are[sic] restricted to low rise (maximum 6 storeys) so as to allow the prevailing of sea-winds, and off shore breezes. The designation of breezeways coincides with other design concerns such as building set black along primary road, provision of landscape features such as parks and lakes and the restriction to low rise structures at the GIC zones.



Breezeways of Tseung Kwan O identified in the 1984 study



Town block layout of Tseung Kwan O in 1990

A lot later in 2006, 3 years after Severe Acute Respiratory Syndrome outbreak, Planning Department promulgated the Air Ventilation Assessment System (AVAS). A set of guidelines were also incorporated into Hong Kong Planning Standard and Guidelines (HKPSG) to inform planners how to plan better. Breezeways, air paths, non-building areas, setback and open spaces have all been mentioned. In hindsight, we can see that the meteorological studies carried out by the Observatory in 1984 to better inform planning should be regarded as the forerunner of the AVAS. It is however sad that the practice had not been repeated in other new towns or major new developments in the meantime.

With the development of the AVAS to integrate meteorological considerations in urban planning, I am hopeful that a better urban living environment may be charted. I look forward to the next 130 years of the Observatory continuous contribution to the well-being in lives of people in Hong Kong.

本台今昔

Observatory Now and Then

130

130 有緣相聚

Under the same sky

The Hong Kong Observatory and its World-Class Weather Services

岑柏（台長：1984-1995）
Sham Pak, Patrick（Director：1984-1995）

首位華人台長岑柏先生撰寫的回憶錄涵蓋了自他於1958年加入天文台後的人事、財政、技術、及在國際舞台上的進程。岑先生貢獻良多，包括在1975年與當時的天文台台長鍾國棟及大東電報局B. Moul前往北京商討建立香港與北京之間的氣象電訊網絡，為氣象資料交換的有效傳送奠下基石。岑先生於1974年遠赴滿地可（今稱蒙特利爾）參加一個航空氣象聯席會議，獲選為工作組主席。他以工作組主席、港方代表、英方（顧問）代表三重身分，領導該工作組再草擬及完成一份國際民航組織規管航空氣象服務的標準文件，其間的經歷及付出的心血，至今難忘。

The Hong Kong Observatory (HKO) will be celebrating its 130th Anniversary in 2013. An anniversary publication will be issued and I have been invited to contribute an article. Having had behind me some 37 years of active service (including 11 years of directorship (1984-1995)) with the institute, I feel it as an honour, and an obligation too, to accept the invitation and write this short memoir.

I joined the Observatory in August 1958 as a scientific officer in the government departmental professional grade. The department then had a total staff of about 80, there were only a few professional officers who were all university graduates. In the year 1995, when I retired, the total number of staff had grown to about 300, a number which had steadied till now. However, the number of scientific officers (SO) had increased significantly to 58, and the number of technical officers (name later changed to 'experimental officer' (EO)) increased from 9 to 46.

A group photograph of Mr. Sham Pak (middle, first row) and colleagues of the Hong Kong Observatory.

The directorate now consists of 1 director and 4 assistant directors, compared with 1 director and I deputy director in 1960.

From left to right (first row): CY Lam, Robert Lau, Patrick Sham (the then Director), HK Lam and Elaine Koo in the 1990s.

The staff increase was essential in order to cope with the ever-increasing expansion of aviation, maritime and coastal installations, shipping and the general public. Also, over the years, the Observatory has taken on new functions like the monitoring of radiation in relation to the Daya Bay Nuclear Power Station.

After an 8-month-long intensive training course in the U.K. Meteorological Office, I returned to Hong Kong and immediately started learning how to be a weather forecaster.

A newcomer with no practical experience, I must say that I still found the basic facilities and the general working conditions in the Observatory forecasting office somewhat lacking when compared with what I saw in the U.K.

The duty forecaster's job was to analyze all incoming data from land observing stations in Southeast Asia and reports from ships in the South China Sea and the Western Pacific. He then applied known forecasting techniques to arrive at a prediction. If the prediction indicated any adverse weather conditions which might affect Hong Kong or any sea or air routes, he should alert those concerned without delay.

Scanty incoming observational data defy useful analysis. Hong Kong's poor (but costly!) communications then were to be blamed and the situation needed to be improved. I had often heard people say: "Telecommunication is the lifeline of meteorology!"

Aside from his forecasting shift duties, a scientific officer, for his future career, had to be put in charge of a technical section such as instrument section, seismology section, telecommunication section, etc. It was when I headed the telecommunication section that I discovered the existence of the World Meteorological Organization (WMO)'s plan for a Global Telecommunication System (GTS). The GTS required Hong Kong to be linked to Tokyo and Bangkok by point-to-point communication circuits. A working group named the WMO RAII[1] Regional Working Group on Telecommunication had been formed to oversee the implementation of the regional plan. Membership of the group included U.S.S.R. (chairman), India, Japan, Thailand, Pakistan and WMO experts. I saw the immediate and long term benefits to HKO if Hong Kong joined the Group. With the Director's approval, I represented Hong Kong at a couple of the Group's sessions in the mid-60s.

Parallel to the progress of the Group's work, the Hong Kong Observatory entered into bilateral discussions with Peking's

---

1 RAII, one out of six WMO regional associations, is responsible for the co-ordination of meterological, hydrological and related activities wthin Asia.

(the name later corrected to 'Beijing') Central Forecasting Office on the setting up of a direct data link between the two places, Peking and Hong Kong. Following a formal visit[2] to China by a Hong Kong delegation (Observatory Director G.J. Bell, B. Moul of Cable & Wireless and myself) in October 1975, an agreement was signed to establish the link. I was pleased that the link could be in place as early as 1979.

Meanwhile, the Hong Kong-Tokyo point-to-point link was rented from Cable & Wireless. The submarine cable encompassing this link was later replaced by a more efficient optical fibre cable.

The Hong Kong-Bangkok circuit suffered a series of delays. A senior experimental officer from HKO had to be seconded to Thailand for several months to help out with standardizing computer hardware and software of the terminal equipment.

As expected, the large amount of data from the three circuits was too much and too fast to be handled by the human plotter in real time. Appropriate computer software was therefore introduced to do the plotting, but the actual analyses were retained and performed by the duty forecaster as the vital basis of his prediction. Computer-generated analyses and prognoses continued to serve as useful references.

By now, masses of basic and processed observational data of Hong Kong and the region are accumulated and kept in HKO's library. They are available for research[3], especially for climatological studies.

---

2 See Attachment – episode 1
3 See Attachment – episode 2

The last quarter of the twentieth century saw significant advances of many technologies. What benefited meteorology most were remote-sensing, digitizing, computer and information. Examples are meteorological radars and meteorological satellites for tracking storms, typhoons and detecting clear-air wind shear and turbulence, high-speed computers for numerical prediction up to a few days ahead, modelling and display of storm surges, etc.

Over the years HKO was able to keep abreast of these advances.

Siting of out-door weather sensors over a small but hilly area like Hong Kong can be tricky, but we managed to find suitable sites for a dense network of wind, temperature and rainfall stations. Information on the variation of weather over different parts of the territory is most welcome by the general public. Nowadays, it would be rare for any citizen not to hear the weather broadcast of this information immediately before or after the news.

It is worth mentioning here the three important occasions in the history of Hong Kong's aviation when the Observatory was heavily involved:

(a) 1954 - New runway at Kai Tak on a promontory into Kowloon Bay

(b) 1975 - Extension of Kai Tak runway (from 2529 m to 3390 m) to meet long haul operating requirements

(c) 1998 - Operation of the New Hong Kong International Airport at Chek Lap Kok

Prior to each occasion and to suit the new environment, new and replacement equipment/systems were purchased and installed. Siting of new airport radars at times presented difficulties which were almost insurmountable.

The HKO took pride in having on its staff teams of experts[4] to look after the maintenance and development of system hardware and computer software. The 24-hour standby arrangement helped to cut down the 'down' time of important equipment such as radar and satellite receivers, especially on weekends and holidays.

The beginning of the 1980s saw the completion of a new 9-storey building next to the old 1883 Building and the modernized and well-equipped Central Forecasting Office (CFO) thus fulfilling DHKO's promise of a better working environment to the forecasting staff. Some shift workers even said the atmosphere within the office was 'inspiring'.

The quality and usefulness of a weather forecasting/warning depends ultimately on the forecaster's skills and experience. Refresher training courses/seminars were regularly organized to update staff's meteorological know-how.

For years, senior experienced division heads were encouraged to adjust their daily schedules to enable them to attend the morning and afternoon weather briefing sessions conducted by the duty forecaster. In tricky situations, their experiences were pooled together and brought into play. The Director himself took all decisions on the issuing and timing of local tropical cyclone warnings for the general public.

One of the perennial problems facing the directorate, particularly at budget estimates time, was to find additional office space for the staff. For many years during the 1960s and

4 See Attachment – episode 3

1970s, measures were taken to ease the problem, e.g. turning some veranda space into small offices, extending the already small radar display room adjacent to the forecast office on the ground floor of the 1883 historic building onto the driveway at the back, relocation of the library, renting of offices in the nearby Tsim Sha Tsui commercial area, etc. But these measures were mostly temporary and make-shift. New recruits and admission of female staff made the situation even more critical. The crowded forecast office and its noisy telephone background were just not conducive to accurate weather forecasting.

There was no hope for a long term improvement and solution until Central Government approved the construction of a 9-storey building next to the old 1883 building. It took the most of 1970's to complete the project! (There was even a two-year suspension of building work due to financial constraint.)

New building under construction

By the end of 1981, all operational divisions were moved into the new building

From left to right: Patrick Sham, HRH Princess Anne, Sir Edward Youde and Lady Pamela Youde (now more conveniently called the Centenary Building). It was officially opened by HRH Princess Anne on 30 April 1983 (see photograph).

Over my 37-year-long career with the Observatory, I think I had attended more international meteorological meetings than anyone of my colleagues in the Department. The experience[5] is simply unique and most valuable. Exposure to international meteorology is both challenging and enlightening. It helps one to understand, at the forefront, problems related to the provision of reliable weather and warning services to avoid danger and loss of lives and property.

Let me quote an old saying:

"Everybody talks about the weather, but nobody does anything about it."

But we do! The Hong Kong Observatory and the world meteorological community do! Weather is now a global issue, we are doing everything possible about it.

Attachment

Episode 1 - Visit to the Peking Weather Centre - 1975

At short notice, I was instructed to join a Hong Kong delegation to the Mainland to discuss detailed arrangements for a meteorological data link between Hong Kong and Beijing. In October, the weather in Beijing was not cold and quite pleasant. I was thrilled and full of expectations since this would be my first visit to the Mainland.

5 See Attachment – episode 4

The other two members in the Hong Kong delegation were G. J. Bell (Director HKO) and B. Moul (Cable & Wireless), both European. We arrived at Beijing on a Sunday evening.

The next morning, I was shocked to find that our Beijing counterparts were not prepared to use English in our deliberations, probably with the misunderstanding that I could also take up the role of an interpreter. Moul did not know Chinese, Bell spoke some Cantonese, and my Putonghua was hopelessly limited.

I had to struggle through the next four days in order to finish the agenda in good time. The 3-way interpretation (English-Cantonese-Putonghua) within and outside the meeting often gave rise to amusing moments, but there was no denial that I was a sub-standard interpreter.

Episode 2 - Research

As the Hong Kong Observatory is essentially a Government service department, very few pure research projects are carried out. However, applied research that has results applicable to the improvement of the service - for example, typhoon forecasting, is given priority in expending departmental resources.

In 1988, together with a few HKO colleagues, I founded the Hong Kong Meteorological Society to provide extra opportunities for meteorologists and academics on related scientific fields to meet. Since then, the Society has produced annual bulletins in which news and research papers were published.

Episode 3 - Detection of clear-air turbulence (CAT) and windshear (WS) in Hong Kong

The Department began to study this weather phenomenon in the 1970's because of its significance to aircraft in flight and particularly in the landing and take-off phases. There had been serious accidents at the time and many investigation reports concluded that these accidents could have been avoided had there been early or real-time alert/warning of the occurrence of CAT/WS. Lidar (or laser radar) technology was thought of as the best tool for developing a viable system.

In 2005, a team of HKO experts, headed by C.M. Shun Senior Scientific Officer, now director (2011), after series of trial-and-error tests and failures, made a breakthrough and successfully built a prototype lidar windshear detection system for use in the Hong Kong International Airport. The system was the first of its kind in the world. Instant CAT and WS occurrence at Chek Lap Kok can now be detected by this 'state-of-the-art' system.

I was proud to witness HKO's expertise and dedication to science!

Episode 4 - A delegate wearing 3 hats!

Hong Kong is a member of the World Meteorological Organization (WMO), and is represented in most of its Technical Commissions. These Commissions hold conferences/meetings every 3 to 4 years, usually at the WMO Headquarters in Geneva, Switzerland.

DHKO attends all WMO Congresses as the Permanent Representative (PR) of Hong Kong with WMO, and designates senior officers to attend meetings of the Technical Commissions.

International Civil Aviation Organization (ICAO) headquarters is in Montreal, Canada. Hong Kong is not a member of ICAO and HKO's interest in aviation is covered by including an 'advisor' in the U.K. (PRC since 1997) delegation.

Due to shortage of senior staff, the Hong Kong Delegation to meetings overseas was usually a one-man delegation. In 1974, a WMO CAeM[6]/ICAO MET DIVISION extraordinary conjoint meeting was held in Montreal. At that meeting I was elected chairman of a working group to complete a redraft of the ICAO regulatory publication - "Annex 3". Several evening/night sessions had to be held that made me "A delegate wearing 3 hats" :-

(i) Head of Hong Kong Delegation

(ii) MET (advisor) of U.K. Delegation

(iii) Chairman of Working Group

I did find the workload a bit 'heavy' especially after a long, multiple-flight (Hong Kong - Tokyo - Vancouver - Toronto - Montreal) journey!

6 CAeM is Commission for Aeronautical Meteorology

天文台點滴

林鴻鋆（台長：1996-2003）
Lam Hung-kwan（Director：1996-2003）

Dr. HK Lam recalls the old days in his early career at the Observatory including his recruitment into the Observatory, establishment of the seismological network in the 1970s, automation of weather stations and his first landing on the uninhabited Huangmao Zhou in the 1980s. His stories about the pioneering and innovative technological development and rare photos of colleagues and partners form an invaluable part of the collective memory of the Observatory.

1970 年 5 月 8 日的南華早報刊出一段公務員招聘廣告 (圖一)，當年的皇家香港天文台 (Royal Observatory) 招聘科學官 (Scientific Officer)。這是天文台多年以來首次登報招聘科學官，剛好我正在香港大學就讀特別理學士課程的最後一年，時間配合得天衣無縫，馬上遞交申請表，經過英語筆試，兩個多月後應邀出席面見，記得當時共有 5 位人士接見，除部門秘書外，還包括台長 Gordon Bell，高級科學官錢秉泉，Frank Apps 及 Peter Peterson，加上副台長 John Peacock，是當年天文台整個管理階層。

HONG KONG GOVERNMENT VACANCIES

The following vacancies exist in the Public Service:-

1. ***SCIENTIFIC OFFICERS (Male),*** the Royal Observatory (pensionable for local candidates who would be on probation for 2 years in the first instance).
2. **Qualifications:** Candidates should (i) preferably be under 35 years of age; (ii) have a good Special Honours degree in Physics or Mathematics or an appropriate science subject from a Hong Kong or British University or equivalent; (iii) have one year's post graduate experience in an appropriate scientific field; (iv) preferably have post graduate experience in a relevant Geophysical science such as meteorology.

…

圖一 1970 年天文台科學官招聘廣告

面見後石沉大海，直至差不多一年後，收到部門秘書 1971 年 7 月 5 日的來信取錄，正式開始 32 年的天文台生涯。

細看當年的招聘廣告，招聘的職位是 Scientific Officers (Male)，原來當時公務員有些職位祇准男性任職，女性無緣問津，就算一

些男、女性都可任職的職位，女性職員的薪金亦比男性職員低百份之二十左右，見同一日的廣告例子 (圖二)。

HONG KONG GOVERNMENT VACANCIES

The following vacancies exist in the Public Service:-

1. ***INTERPRETER / TRANSLATOR CLASS II*** in various Government departments pensionable (on probation for two years in the first instance) by examination.
2. Salary: Male : $1,316 - $2,421) p.m.
   Female : $1,082 - $2,046) p.m.

by 13 annual increments with prospects of promotion to Class I.

Candidates possessing a Hong Kong University degree or equivalent may be allowed to enter the scale at $1,741 p.m. (male) or $1,421 p.m. (female), an allowance of $60 a month is also payable to interpreters for knowledge of each approved dialect in excess of one, subject to their Passing the prescribed examination.

…

PUBLIC SERVICES COMMISSION

圖二 公務員招聘廣告顯示當年女性薪金較男性低

當年天文台全台的部門職員 (departmental staff) 全是男性，可算是極端例子之一，這個情況直至 1970 年代中期才有改善。記得當時為籌備接納女性同事而大費周章，其中一項工作是在總部及各個外站加建女廁及女休息室，因總部及各個外站地方有限，在資源限制下，這項工作要由副台長親自督導、統籌和協調完成。以我一個新入職的公務員來說，可感到這項工作是當時天文台較大型的建設之一，可能亦是激發天文台後來加建百週年紀念大樓概念的其中一個因素。天文台第一位女性同事是許小姐，較為人熟識的稱謂是古太或 Mrs Elaine Koo。

再看當年的招聘廣告，職務(Duties)項下寫上一句："Successful applicants with an active interest in electronics will have the opportunity of working in this field." 當時天文台尚未全面電子化或數碼化，唯一的電子儀器是一部 Plessey 43S 氣象雷達及一部 3-cm Decca 41 海事雷達，至於接收衛星圖片，則由一部改裝的傳統甚高頻 (VHF) 收音機加上自製天線擔任。從廣告中可見當時管理層的高瞻遠矚。

入職第一天見副台長 John Peacock，他派下來第一件工作是申請護照，一個月後已身在英國攻讀培訓課程，除常規氣象課程外，當年負責培訓工作的副台長特別安排 The Royal Greenwich Observatory at Herstmonceux 提供三個月的地磁 (Geomagnetism) 在職培訓。1972 年回港後通過了天文台的在職氣象訓練後，被派主管地震組，負責地震、天文、授時及從香港大學物理系接收地磁量度的工作。

最早引發電子化及自動化的概念是見到繪圖室 (Plotting Office) 內的當值同事要用口述方式報時，查詢的除公眾外，亦包括需要準確時間的執法機構，如警隊，海事處，民航處等等。當時大型集成電路 (Large-scale Integration (LSI) Integrated Circuits) 剛剛萌芽，在李忠琛的引領及呂友樂的不懈合作下，造出一部與天文台授時標準同步的電子時鐘，安裝在繪圖室內，並可在電話內發出「必」聲報時。

1976 年中國唐山 7.8 級大地震，引起公眾對香港境內及鄰近地區地震風險的關注，天文台趁此機會與廣東省地震局及中國國家地震局開展合作關係，亦開始構思在境內建造自動地震站網，並即時將資料傳送至天文台總部作分析。這是我第一次做系統設計，除了要達到技術目標外，亦要盡量減低造價。當時得到一些

國際機構的協助，借來一套可攜地震儀，我和梁振中、呂友樂、梁君碩等人於 1977 年夏秋季走遍港九新界離島，找尋適合建站的地點（圖三）。當時我對要求撥款的經驗不足，衹要求撥款購買地震監測儀器及資訊分析系統，竟沒有要求撥款建站及增設維修人員，幸好與當時的工務局 (Public Works Department) 的建築師商討後，由工務局提供圖則、建築材料及建築師監督，找到當時的監獄署（現時的懲教署）立項建站。維修方面亦要地震組的同事捱義氣，説不定可能亦成就他們之後在電子工作上的成果。

圖三 天文台職員尋找建立地震站網的地點

這套自動地震站網成本效益高，聯合國的教科文組織 (UNESCO) 亦認同，1978 年更邀請我擔任顧問，向孟加拉政府提供意見，改善吉大港地震觀測站的儀器及其他設施。

70 年代的科學官 (後改稱科學主任)，都是一身兼兩職，除主管一個部組外，亦要當預報更，無風球時是 AM 更 (即下午更及早更)，有風球要加上 N 更 (即夜更)，我入天文台時衹有 6 位科學主任，平均每月要當 5-6 個 AM 更。當更時有困難都找繪圖室的當值「掃把」(Duty Supervisor) 幫忙解決，總督導 (Chief Supervisor) 廖炳培及後來的崔廣、呂友樂等更是我在預報工作上倚賴的支柱。

我入行做氣象工作時，天文台衹有 5 個氣象觀測站，提供實時資料，全部以人手操作觀測及傳送，除天文台總部外，還有京士柏探空站，啟德機場氣象所，長洲及哥連臣角航空氣象站。遙感資料有 Plessey 43S 及 Decca 41 提供的雷達資料，及每天 1-2 次不定時收到的極軌氣象衛星 (Polar-orbiting Satellite) 傳真資料。當時新界的新市鎮建設剛起步，沙田新市鎮設計和建設如火如荼，但新界的氣象資料完全欠奉，作為預報員的我，感覺要給新市鎮提供氣象服務有一定困難，加建傳統氣象站有資源及管理上的限制，鑑於自動地震站網的成功，興起自動氣象站的概念。

不過最先動手設計的是自動雨量站，事緣土力工程處 (Geotechnical Engineering Office) 與天文台合作向市民提供山泥傾瀉警告，需要全港斜坡的實時雨量資料，1978 年 8 月，李忠琛和我合作，利用一個翻斗式雨筒及一個 CANON 計數機，設計驅動線路，在一個月內成功造出第一個自動雨量站，在地震組同事大力合作下，在 78 年雨季完結前安裝了 20 個站，資料實時傳送到土力工程處。

調任儀器組主管後，繼續前任退休主管陳殿楹在低空風切變監測系統的建設工作，與李克能及呂友樂合作，初次接觸到航空氣象監測，建設風力及其他氣象數據監測站，及利用微型電腦控制硬件及即時處理及分析資料的技術。

自動氣象站的設計方框圖漸漸完成，儀器組的同事負責建站選址及安裝氣象儀器，雷達機械師隊伍負責電子硬件及軟件的工程設計及建造，第一批自動氣象站於1984 年在沙田馬場及天文台總部開始運作，之後再加上赤鱲角、流浮山及打鼓嶺。

發展自動氣象站的另一里程碑是1983 年，與廣東省氣象局達成初步合作協議，揀選南海一海島建立自動氣象站，廣東省氣象局負責建站的土木工程而天文台負責提供儀器、維修及資料收發。1983 年12 月6 日李忠琛和我，在中國國家氣象局、廣東省氣象局及珠海市氣象局的人員陪同下，首次乘坐中國海軍的登陸艇登上黃茅洲島（圖四），選定站址的位置（圖五）及作無線通訊測試。各人體驗過船程的風浪，登陸時的危險及爬上山頂的艱辛，一致同意建立直升機場，作往返交通之用。正式的合作協議於1984 年由台長 John Peacock 簽署，是自1975 年香港 - 北京氣象通訊線路協議簽署以來首次與內地氣象單位簽署協議。

圖四 首次登上黃茅洲島的情況

圖五 黃茅洲站的選定位置

鑑於島上的惡劣環境，回來後同事們楊繼興、吳建輝及丘禮堅等將自動站的軟硬件重新設計，感應元件亦作出重大修改，以達至低耗電量及免維修的要求，亦首次應用太陽能電池板供電，安裝方面亦考慮了海水腐蝕、野外環境及溫度變化等影響。這些設計非常成功，黃茅洲氣象站自 1985 年起得以運作，每年上島兩次做預防性維修，2002 年 4 月 11 日我第一次重新上島(圖六)，見證同事們的成果。黃茅洲的設計直接影響其他氣象站的設計和安裝，提高整個站網的運作效率，及大幅減少了維修工作，亦造就了以後與廣東省氣象局合作加建其他海島站。

圖六 筆者(左三)於 2002 年重臨黃茅洲

70 年代末期，天文台開展赤鱲角作為新機場的氣象研究，我亦有幸參與建設赤鱲角氣象站，搜集資料，這個站是人手操作，原因是很多航空需要用的氣象數據監測當時尚未能自動化。不過亦有機會體驗一些當時最先進的自動監測儀器，如能見度儀(Visibility Meter) 及激光雲冪儀(Laser Ceilometer) 等(圖七)。

圖七 上世紀七十年代末期的赤鱲角氣象站，右一為鍾國棟台長，中間為筆者

另外以下幾張有紀念性的照片，希望與大家分享：

在 Peter Peterson 1982 年 4 月退休晚宴上

1981 年 2 月拍攝的團體照，內有 5 位前天文台台長

1983 年11 月拍攝的團體照，內有6 位前天文台台長

1999 年9 月16 日因應颱風約克發出的10 號風球，是16 年以來首次(對上一次是1983 年9 月9 日颱風愛倫)

李忠琛（前中）2004 年1 月8 日與天文台同事相聚。李忠琛於1981 至1992 年出任天文台助理台長

天文台雜憶

林超英（台長：2003-2009）
Lam Chiu-ying（Director：2003-2009）

In a light-hearted way, Mr. CY Lam reminisces about interesting times in his early career with the Observatory. He describes his personal experience as a weather forecaster, and the background of the Observatory's issuance of a pre-8 announcement about two hours ahead of the No. 8. Mr. Lam also recounts the Chinese liquor culture during his duty visits to the Mainland in the 1980s and 1990s, and his "trick" to avoid being over treated.

1974 年我加入天文台，第一份工作是輪班的預報員，工作主要是以 3B 鉛筆畫天氣圖，加上一些以濕紙傳真機打印的衛星雲圖（現在的預報員肯定認為模糊難辨和毫無用途），然後套上氣象的理論和天文台前輩的經驗，得出明天天氣的估算，我用「估算」這個詞，因為看資料和以理論去思考，是「算」的一種形式，「估」則反映當年傳統資料貧乏，理論多好也無計可施，預測也就難免不太確定，可是時限一到，自己毫無把握也必須把預測發佈出去，落筆之時無法避免「估」的成份，那時天文台天氣預測「估」的比例很大，現在則主要以「算」為基礎。

林超英昔日在天文台繪製天氣圖

我在英國學習氣象學，歸港時自我感覺良好，以為大學成績不錯，氣象理論又學得差不多，應該足以應付天文台天氣預報員的工作，不過現實是殘酷的，由於數據和儀器的限制，我的天氣預測出錯不能說少，開始明白為甚麼早年香港市民以「日本鬧鐘

冇時準」[1] 形容天文台的預測，又有流行笑話說：「天文台預測有雨就唔駛帶遮」。一次上班途中，小巴上聽到乘客大罵前一天預測不準確，話說得很難聽，幸好他不知道預測是我發出的，否則他便會見到我的滿面尷尬。當了預報員兩、三個月，很快便學懂做人必須謙虛，尤其是在自然界面前。

在天氣預測總部 (Central Forecasting Office) 工作，有很多離奇怪誕的事。某次颱風襲港，我當夜班，深夜時份，同事轉了一個電話查詢給我處理，對方是講英語的女士，開始時問了一些颱風的情況，後來話題一轉講述她一個人在港島南區的家，風雨中感到十分孤寂，原來打電話來天文台其實是想找人跟她傾談解悶，由於沒有工作在手，好言好語跟她談了一下，讓她心安一些，最後她感覺較好時自行收線。這個事件令我想到，天文台的工作，不祇是科學，還有讓市民安心的一面。

另外一次颱風襲港，也是深夜時份，同事告訴我有一個洋人說話很凶，然後把電話轉給我，開始時確是大聲夾惡，談了兩句便要求與最高級的官員談話，當時我祇是專業職系最基層的科學主任，但是環顧四周，又確是在場的「最高級官員」，所以我便回答說：「我就是最高級的官員」，也許當時回港不久，英文口語還可以，「最高級官員」銜頭又發揮一些作用，對方即時變得十分客氣，談了不久問題便解決了，他也就歡歡喜喜地道謝收線。同事笑我好大的膽子自認「最高級官員」，不過我想既然當值就要夠膽承擔，難道事無大小都找台長嗎？

天氣預測總部的科學助理同事，是接聽外界電話查詢的第一線人員，他們回答問題全靠已經發佈的預測，明天的預測沒有困難，但是通常打電話到天文台的人，往往想知道幾天後的天氣預

1. 上世紀 50、60 年代日本工業起步不久，產品質素比英、美產品較差。

測，這些電話便轉給我接聽，數目多時很干擾我的正規天氣分析和預測工作，影響預測的質素，後來我想了一個辦法，在周末和假期前幾天，在稍有把握的情況下，擬定一個數天預測，寫在字條上，給科學助理們作為回答市民查詢的依據，既減少我的工作量，又讓助理們覺得自己回答查詢很有本事，是市民、同事和我的三贏方案。回想起來，當年我確是大膽了一些，因為我從沒向上級請示，便自行執行了規章裡沒有的程序，不過我們的存在是為了服務市民，應該盡力給他們所要的信息，所以也就必須不時開拓新的服務形式，不能把自己困在規章之內而無所作為。

1986 年我借調到布政司署經濟科（相當於現在的商務及經濟發展局）半年，在中環上班，有一天下午，天文台掛起八號風球，所有中環人都按香港的習慣離開公司回家，我也跟着大隊跑進了中環地鐵站，無數人在月台等候列車，我在擠逼不堪的人群中動彈不得，電梯不斷把乘客送到月台，我感到背後傳來人推人的壓力，卻又必須頂住不向前走，怕把站在月台邊緣的人推下鐵軌[2]，情況十分恐怖，在這種情況下最終沒有傷亡可以算是奇蹟，但是我想我們不可能永遠幸運，必須認真處理新時代的新問題。

其實自從集體運輸系統出現後，天文台便開始注意到掛起八號風球後的一種新情況，即是大群乘客在極短時間內，蜂湧到地鐵站內造成擠逼，初時全社會都未適應過來，沒意識到地鐵帶來方便也同時帶來新的問題，1986 年的八號風球除了給我親臨其境的實境教育，也終於引起全城關注，次年天文台便推出了新措施，在掛起八號風球前發出兩個小時的預警，政府帶頭採取按員工情況分批下班的安排，又鼓勵其他機構跟隨，加上交通運輸行業相應配合，以及後來加了月台幕門，「幸運」得以延續到今天，

2. 地鐵裝設月台幕門是很多年後的事。

不過天文台在運作風球制度時，再也不能不考慮風球本身可能造成的潛在殺傷力。

80 年代和 90 年代天文台與內地的交往漸趨頻繁，但不是所有同事都喜歡到他們心中認為落後的地方，我則覺得返回內地有不斷的新發現，對到內地公幹沒有抗拒，結果我到內地出差的次數比較多。到內地出差的最大麻煩是飲酒文化，香港人少飲酒，內地則有以酒迎賓的傳統，努力勸酒，有一次陪同上司到內地，在首個到訪的城市，主人設了歡迎晚宴，我拿出口袋裡的藥丸，解釋服西藥不能喝酒，主人於是轉移向上司勸酒，無可奈何之下，他結果喝了一些。一兩天後我們轉往另一城市，晚上循例設宴款待，上司學乖了，在我掏出藥丸之前，先掏出他的藥丸，結果當晚的酒就由我喝下去了！幸好經過多年磨合，後來我們到內地公幹，主人再不勉強客人喝酒，大家也就不需要鬥快把藥丸掏出來。

在天文台工作三十多年，可記的瑣事甚多，退休不久，先寫年代比較久遠的故事，將來有機會，再把鏡頭拉到「近代」罷。

烏茲別克－2008年會議回憶

李本瀅（台長：2009-2011）
Lee Boon-ying（Director： 2009-2011）

During the 2008 World Meteorological Organization Regional Association II (Asia) meeting in Uzbekistan, the Hong Kong Observatory proposed three pilot projects, respectively on numerical weather prediction, co-operation on meteorological satellite, and management of meteorological observational data. These projects may have far-reaching effects in respect of the Region's future meteorological development. Dr. BY Lee recounts in the article the background leading to the proposals, the approval processes they have gone through, as well as tidbits of interest to the general reader.

2008 年十二月，台長林超英委派我和助理台長岑智明〔現任台長〕出席世界氣象組織第二區域（亞洲）協會四年一度的會議。香港天文台在會上建議了三個試驗計劃，範疇分別是數值天氣預報，氣象衛星數據、產品及培訓，以及地面、高空及氣候觀測數據的質量管理，均可對區內甚至全球氣象學有長遠影響。我相信台裡台外會有興趣知道事情的背景和過程。

在聯合國世界氣象組織 (World Meteorological Organization) 架構下，全球分為六區。第二區涵蓋亞洲絕大部分國家，共 35 位會員，幅員最廣，人口亦最多。會議地點是塔什干 (Tashkent)，是中亞國家烏茲別克的首府。

隨着該區近十、二十年來經濟急劇發展，整體上氣象功能亦逐步提升。天文台內部的技術例會早已注意到這趨勢。一方面是覺得欣喜，另一方面則是有感區內政治、歷史等種種原因，在更緊密合作和共同發展上依然留有很大的空間。

往積極的一邊想，正是因為天氣無國界，如果能夠促進區內氣象學的進一步合作，對香港、本區甚至全球均有裨益。舉一個簡單例子，假如能夠幫助一處地方徹底改善其觀測，不僅對該地及鄰近地方的氣象業務有幫助，對現今多個全球預報電腦模式的表現亦會有正面影響。

說到全球預報電腦模式，現今世上眾多模式中，以歐洲中期預報中心 (European Centre for Medium-Range Weather Forecasts，簡稱 ECMWF) 表現獨占鼇頭，而區內日本氣象廳 (Japan Meteorological Agency) 的模式亦名列前茅。除日本外，亞洲方面近年來中、韓等亦大力推動，培育了不少人才。此外，區內電腦設施亦比其他區不遑多讓。天文台於數值預報應用的經驗已有廿多年，不時與日本及中國大陸等相互交流。而於台內集思會上亦曾就建構一所〔虛擬〕亞洲數值天氣預報聯合體 (Asian Consortium for Numerical Forecasts - ACNF) 作討論。在推動這 ACNF 上，香港天文台的優勢在於其海外聲譽，且具聯絡各方的能力。

氣象衛星方面，二區內具有發展此能力的會員國高達五個：日、俄、中、印度及韓國〕，數目上是首屈一指〔歐洲的氣象衛星主要是西歐多國合作的結果〕。可以看到，假如能在衛星數據、產品等發展上加強整合，對區內的氣象觀測、預報、減災甚至全球氣候監測等多個範疇都有益處。

基於以上的考慮，天文台在會議開始時便諮詢多個會員，包括中、日、韓、以及其他來自中東、東南亞的會員，得到的回應都是正面的，有些更表示天文台的想法説出了他們的心聲。其中更有會員提出應在地面、高空及氣候數據的質量管理上加強工作，以進一步增強區內以至全球氣象服務及氣候監測的能力。對於此提議，我們理解到其重要性不下於其他兩項〔即數值預報及氣象衛星〕，尤其是由於全球氣候變化近年廣受關注。

於是天文台當下便構思了三項試驗計劃 (pilot project)：

(a) 數值天氣預報模式合作，包括由其中幾個會員提供一些容易使用、可運行於主流電腦平台，包括個人電腦的數值天氣預報模式，並將一些預報產品甚至模式軟件的源碼上載至 ACNF 的網站供會員分享。

(b) 氣象衛星數據、產品及培訓，包括技術交流，並將一些業務數據及產品上載互聯網供會員分享。

(c) 地面、高空及氣候觀測數據的質量管理，包括技術交流，並將有關數據及產品上載互聯網供會員分享。

由於須要撰寫計劃書，我和岑智明兩人日以繼夜，務求於限期內完成。於是，甚至在會議期內一個周末，會方安排到故都撒馬爾罕 (Samarkand) 考察的一天，我們也在火車旅途上趕工。

討論這三項計劃的日子終於來臨。我懷着戰戰兢兢的心情，在台上作了介紹。會場反應比預期好，多位代表表示支持。二區主席、巴林氣象局局長 Majeed Isa 更不遺餘力，台前幕後大力推介。大會遂通過全部三項計劃，並決議各計劃的主催及其他成員分別為：

(a) 韓國及中國香港〔其他成員：巴林、中國、印度、日本、哈薩克斯坦、科威特、吉爾吉斯斯坦、蒙古、阿曼、巴基斯坦、俄羅斯聯邦、泰國、烏茲別克斯坦及越南〕

(b) 日本及韓國〔其他成員：巴林、中國、中國香港、印度、吉爾吉斯斯坦 、馬爾代夫、阿曼、巴基斯坦、俄羅斯聯邦、烏茲別克斯坦、越南，及作為觀察成員的歐洲氣象衛星中心〕

(c) 日本 〔其他成員：巴林、柬埔寨、中國、中國香港、印度、哈薩克、科威特、吉爾吉斯斯坦、蒙古、阿曼、巴基斯坦、韓國、俄羅斯聯邦、烏茲別克斯坦及越南〕

說起來，Majeed 和我可算是「同學」。我早於 1979 年在英國氣象局學院 (Meteorological Office College) 就讀時與他結識，雖然大家不同班。敘舊時，大家都記得那些年一起打乒乓球玩音樂的日子。這丁點關係，以及天文台和眾多會員多年的緊密合作，或多或少為計劃順利通過提供了有利的條件。

個人對這三項計劃發展的潛力抱正面態度。由 2008 年至今，在有關會員努力下，短短數年已經出現了一定的成果。眾會員現在能夠於網上瀏覽及獲取一些有關產品及研究結果，供業務之用。中、長期看，「亞洲數值天氣預報中心」及「亞洲氣象衛星大聯盟」等願景，畢竟不是一朝一夕的事，二、三十年不為功。隨着區內經濟及人力資源進一步發展，以及低度發展國對氣象工作自覺提高，整體事情是樂觀的。

圖一　2008 年聯合國世界氣象組織 (WMO) 二區會議與會者合照。前排中為 WMO 秘書長，右六為二區主席，左一為筆者，第三排左四為岑智明。

撒馬爾罕位處古絲路中間，貫通中西，有二千多年歷史。我們參觀了市中心的 Registan，波斯語指一片沙地，由三座宗教學院組成。圖中左面一座建於十五世紀初，以當時偉大天文學家及君主 Ulugh Beg (1394-1449) 命名。Beg 在當地同時建造了當時最大的天象台，但完成後不久即被宗教保守勢力破壞。這不包容的趨勢，折射出穆斯林科技下滑，往後數百年一蹶不振。假如我們對科學不採取開放態度，後果就是重蹈覆轍，自甘落後。

圖二　撒馬爾罕中心景點 Registan。左面為 Ulugh Beg 宗教學院。

時光倒流130年——細味香港天文台歷史的點滴

岑智明（台長：2011-）
Shun Chi-ming（Director：2011-）

Mr. CM Shun, the current Director of the Hong Kong Observatory, takes a journey into the past of the Observatory through visiting ex-Director John Peacock, meeting an old lady who personally met ex-Director Benjamin Evans during the Second World War internment, and attending a talk by Professor P. Kevin MacKeown who wrote a book on the early history of the Observatory. Mr. Shun realizes from these historical recounts that the mission, values and pioneering work of the Observatory in its early days had been succeeded through the generations. He fully appreciates what his secondary school principal told him before: “History is important, learn from it!”

我在學生年代，並不甚喜愛歷史這一科。中學時代的我選擇唸理科，比較喜歡數學、物理和地理。這可能已經埋下了我後來進入香港天文台工作的種子。我曾經向中學校長要求理科生在中學會考不考歷史科，以便集中精力應付其他的科目，但他並沒有批准，還將事情轉告我母親：「歷史是重要的，不可不讀！」當時我納悶，心想校長自己是教歷史科的，當然認為歷史科重要啦！今天我的觀念終於發生了改變。為什麼呢？這正與天文台的歷史有莫大關係。

在 2012 年，天文台同事開始籌備翌年天文台 130 周年的慶祝活動，我也開始搜集歷史資料，希望可以在現時我們所知的基礎上再作補充。在資料搜集過程中，我認識了幾位對香港歷史饒有研究的朋友和學者們，而且更有機會與多位退休已久的舊同事見面。這包括我以前就讀的香港大學的物理學教授麥翹雲[1]（Professor P. Kevin MacKeown）—他於 2012 年 8 月 24 日應邀到訪天文台，與我們分享他研究天文台早期歷史的心得，使我們認識到天文台的創立與在 1874 年發生史稱「甲戌風災」的颱風有頗大的關係；也讓我們了解到首兩任台長 William Doberck 博士和 Frederick Figg 先生的事蹟，比如 Doberck 台長因為未能預警 1906 年災難性的颱風而黯然退休離開天文台。而我在 2012 年11 月第一

費激老台長與夫人 Diane 在英國巴斯（Bath）的住宅門前合照。

1 麥翹雲亦是 "Early China Coast Meteorology: the Role of Hong Kong" 一書的作者。

次接觸的老台長費熬（John Peacock）先生，亦讓我了解一些鮮為人知的天文台往事。

費熬先生是香港天文台最後一位來自英國的台長，他在1950年進入天文台，1981 年接替鍾國棟（Gordon Bell）先生成為台長，1984 年退休。我於 2012 年10 月底參加在日內瓦舉行的世界氣象大會後，順道在英國停留兩天作休假，特地到巴斯（Bath）探望他。他雖然已經 85 歲，但身體仍然非常壯健，還與太太 Diane 駕車來火車站接我，令我十分感動。我到訪他家時，一同翻閱了他珍藏的舊照片，我一面看，他一面講解，如數家珍！雖然來去匆匆，我盡量趁此難得的機會記錄了一些有趣的事蹟，與大家分享。

首先，我發現費熬老台長可能是近代台長中掛十號風球最多的台長！1968 年的雪麗、1971 年的露絲、1979 年的荷貝和 1983 的愛倫的十號風球都是他以署理台長或台長身份處理的，他還珍藏了多幅荷貝和愛倫帶來破壞的照片。

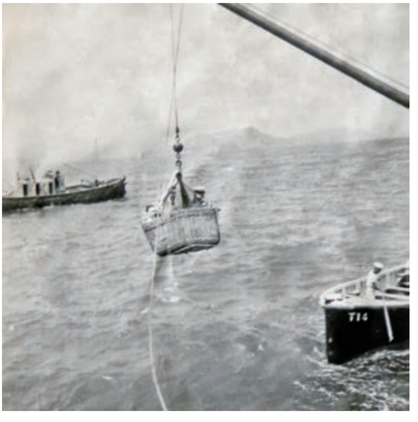
1983 年颱風愛倫襲港，天文台總部的大樹倒下，險些兒壓在温度表棚上面。

費慤老台長的相簿還有很多有趣的照片，我在這裡輯錄了一些與大家分享。

從天文台望向西南方向的早期照片：左面是諾士佛台的樓宇，而右下面出現的圓形結構，由於年代久遠，至今仍未能在天文台的記錄找到。

早期的同事聚會：（從左至右）Colin Ramage[2], Frank Apps, 皇家海軍司令 Dennis Rowe, John Peacock。

早期維修風速計的技術人員（英文稱為 rigger）的高空工作，像馬戲團空中飛人的表演。



早期天文台同事從船登上橫瀾島工作有時需要乘坐吊籃，頗為驚險。

---

2 Ramage 亦是"Monsoon Meteorology"（「季風氣象學」）一書的作者。

他還告訴我幾位前台長的有趣事蹟。

鍾國棟台長算是近代服務天文台年期最長的台長（1965-1981），是費殼台長的前任。原來他們兩人同在1950年前後加入天文台，而費殼只是比鍾國棟遲了幾個月。鍾國棟台長可謂「海、陸、空」無所不能！「海」— 大家從以前的文章可能已經知道他和費殼都熱愛揚帆出海，遊遍香港各處的海岸和離島風光，更曾誤闖內地海域；至於「陸」— 鍾國棟原來更有來頭：想不到他曾經參加在1954年舉行的首屆澳門格蘭披治大賽車，而當年四分十二秒的最快圈速紀錄正是由他締造出來！澳門格蘭披治大賽車的官方網站今天仍記載了這段歷史[3]。最後「空」就更加精彩 — 鍾國棟除了曾經當過皇家香港輔助空軍（現今的政府飛行服務隊）的榮譽司令，他更曾經乘坐輔助空軍的Islander雙引擎飛機在1973年飛進熱帶風暴黛蒂（Dot）的中心，與美國空軍的Hercules（大力士）WC-130運輸機進行同步觀測。這是香港的飛機和人員第一次飛進颱風收集氣象數據。可惜當時並沒有拍下照片，但當費殼台長給我看美國大力士運輸機在1979年於南中國海飛進颱風莎菈（Sarah）風眼時拍下的一些珍貴照片，我還是覺得非常興奮！回想今天我們與政府飛行服務隊合作飛進南


從美國空軍的大力士運輸機（右）拍到的颱風莎菈風眼高聳的眼壁雲團（左），非常壯觀。

3 http://www.macau.grandprix.gov.mo/mgpc/subpage.php?id=527&lang=cn

中國海的颱風收集氣象數據，其實是在延續鍾國棟台長三十多年前的創舉！

Heywood 台長（前排左六）在 1956 年退休時與同事於天文台合影。

談到以往的天文台台長，不得不提 Graham Heywood 先生，他是第二次世界大戰後第一位台長，也是第一批被日軍俘虜的天文台人員。費嶽告訴我 Heywood 的家族顯赫：他原來是英格蘭諾曼王朝的開創者威廉一世（亦稱「征服者威廉」（William the Conqueror[4]））的後代！

費嶽台長對在第二次世界大戰被俘虜的台長 Benjamin Evans 先生也有一些研究：原來 Evans 於 1887 年在印度出生，他和他的兄長皆曾在英國格林威治天文台擔任「計算員」（computer）。提起 Evans 台長，最令人津津樂道的是他在第二次世界大戰赤柱集中營時仍然克盡己任，在非常艱難的生活環境下（例如有一些

4 *http://en.wikipedia.org/wiki/William_the_Conqueror*

戰俘因營養不良和沒有藥物而在集中營死亡），仍然以僅有的香煙包裝紙的背面記錄了1942-1945 年的天氣狀況，充分體現天文台人員的專業精神和無比毅力。

原來Evans 還有另外一個動人的故事：「一個傍晚，一位來自皇家天文台[5]的Evans 先生在屋頂給我們作了一個關於星星的講座。」這故事來自一位已經93 歲多的老太太Barbara Anslow 的日記簿。我有幸得到我以前就讀的中學的副校長[6]介紹，有機會在英國探望她。她跟我說，在1941 年香港淪陷時她只有22 歲，本來在政府總部的地下密室工作，但一夜間變成了階下囚。在關進赤柱集中營之前，原來她和其他人首先被送到中環的一些所謂「酒店」（但其實是妓院）的地方，待了一段時間。她與Evans 台長同是被關進了「大觀酒店」[7]。「酒店」有三至四層，每層有多間小房間，房間非常簡陋及骯髒，只可以容立一張床和一個洗手盆而已，但往往要幾個囚犯共用一間房，居住環境的惡劣可想而知！我們的老台長不單沒有受到逆境的影響而變得沮喪，反而孜孜不倦地為本來各不認識但卻同病相憐的「戰友」上了天文的一課。Evans 台長在逆境中發揮正能量，感染周圍的人去積極面對逆境，不但令人敬佩，也值得我們細心回味和學習！只可惜Barbara 在關進了赤柱集中營後已經再沒有機會見到Evans 台長，否則一定可以為我們道出更多有關他的動人故事。但無論如何，透過本來素未謀面的Barbara，我好像能親身感覺到Evans 台長當年的風采，有一點像電影「時光倒流七十年」的感覺 — 不是嗎？在屋頂講星星的一幕的確是在七十年前的一個晚上發生的啊！

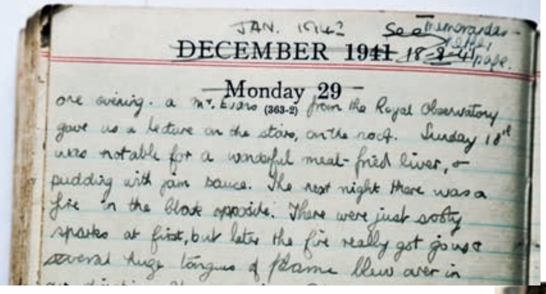
5 即現時的香港天文台。

6 GC Emerson – 他亦是"Hong Kong Internment, 1942-1945: Life in the Japanese Civilian Camp at Stanley"一書的作者。

7 據香港歷史作家及收藏家鄭寶鴻先生提供的資料，當時的「大觀酒店」位於中環德輔道中90 號，即前中環街市的對面。

Evans 台長年輕時的照片（http://www.genealogy.com/）。

筆者與 Barbara Anslow 女士在她的家中合影。



JAN. 1942

DECEMBER 1941

Monday 29

one evening a Mr. Evans (363-2) from the Royal Observatory
gave us a lecture on the stars, on the roof. Sunday 18th
was notable for a wonderful meat-fried liver, &
pudding with jam sauce. The next night there was a
fire in the block opposite. There were just sooty
sparks at first, but later the fire really got going &
several huge tongues of flame blew over in

Barbara Anslow 女士 1942 年 1 月的日記，寫道："One evening, a Mr Evans from the Royal Observatory gave us a lecture on the stars, on the roof."（由 Barbara Anslow 女士提供）。

THE JAIL where American and other prisoners were housed in Hongkong. This jail, the American said in his letter, was "complete with rats, bed bugs, cockroaches, and what-have-you, and was called the black hole of Hongkong."

第二次世界大戰時的香港剪報，可以看到囚禁美國和其他戰俘的「酒店」外貌，報導形容「酒店」內的環境和衛生非常惡劣（剪報由 Barbara Anslow 女士提供）。

我有機會在 2012 年 11 月訪問上海氣象局，當時適逢是上海徐家匯觀象台 140 周年的慶典，我參觀了有關的歷史展覽，發現其中展出的一幅照片，記錄了於 1930 年在香港舉行的首屆「東亞地區氣象局長會議」，當中包括了香港天文台第三任台長 Thomas Claxton 先生和上海徐家匯觀象台第三任台長 Louis Froc 神父。該會議決定了發出熱帶氣旋警告時所用的信號及代號[8]。這個會議比「世界氣象組織」的成立足足早了 20 年。而更值得一提的是，在 1930 的會議後，香港天文台在區域氣象合作繼續發揮影響力。1934 年，第四任天文台台長 Charles Jeffries 先生與徐家匯觀象台的 Ernesto Gherzi 神父一同前往菲律賓，與馬尼拉氣象局合力制定熱帶氣旋警告的程序，成為當時的區域標準。將熱帶氣旋警告標準化在今天仍然是香港天文台在國際氣象舞台上積極推動的議題，可見天文台不經不覺地繼續承傳歷史給我們的任務。

1930 年 4 月 28 日在香港舉行的首屆「東亞地區氣象局長會議」（與會者包括第三任香港天文台台長 Claxton（左五）、第三任徐家匯觀象台台長 Froc 神父（左四）、青島觀象台台長蔣丙然（右二）、東沙氣象台台長沈有基（右一）和代表竺可楨的沈孝凰（右四））。

8　請參考天文台歷史刊物 *"Non-local Storm Signal Code Recommended for Use in the Far East at a Conference of Directors of Far Eastern Weather Services, Held at Hong Kong in the Year 1930"*。

可能因為 Jeffries 台長在區域合作上貢獻良多，他在 1938 年出任「國際氣象組織」（「世界氣象組織」的前身）的「遠東區域委員會」主席。但可惜 Jeffries 台長在任內因心臟病，在 1941 年 6 月突然離世，他的遺體後來安葬在跑馬地的香港墳場。

從麥翹雲教授分享他對首兩任台長 Doberck 博士和 Figg 先生的事蹟，到發現上海徐家匯觀象台與 Claxton 和 Jeffries 台長在熱帶氣旋警告的合作歷史；從老太太 Barbara Anslow 的日記所認識的 Evans 台長，到費慤台長口述有關 Evans、Heywood 和鍾國棟台長的生平和軼事，使我深深的感受到香港天文台 130 年歷史的承傳、使命和信念。這也使我更明白為什麼我的中學校長當年說：「歷史是重要的，不可不讀！」

Peterson's Nose

Peter Peterson

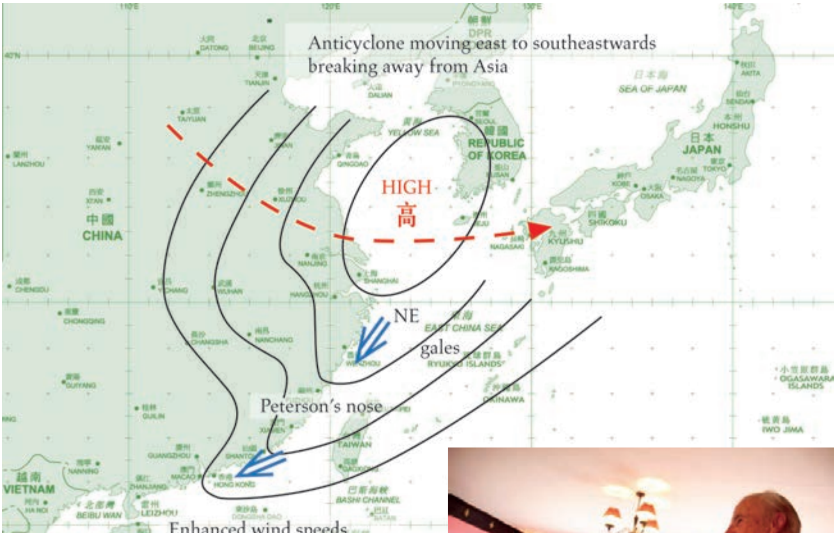
Peter Peterson 先生 1956 年被聘為天文台的科學主任。他憶述於 1949 年在英國皇家學院 David Brunt 爵士和 Shepherd 教授所講授的大氣方程式，用以說明當他在天文台分析天氣圖時發現從台灣海峽伸延至香港狹長的高壓脊，為何同事稱作「Peterson 的鼻子」。

I visited the HK Observatory in 1998 and a young forecaster said that he had never met me but he had heard of "Peterson's nose" and I feel that some explanation is in order. In 1949, when I was at the Imperial College Sir David Brunt and Professor Shepherd spent a lot of time teaching us the equation of motion of the atmosphere. I have forgotten the equation but I remember some of the forces involved. In those days computers were not powerful enough to provide useful numerical solutions so we had to approximate.

The first and dominant term was the Coriolis force. This is caused by the rotation of the Earth. Everything moving freely in the northern hemisphere turns to the right. This is well illustrated by the Foucault pendulum. It also applies to shells fired at long range although the time of flight is too short to make much difference. This force is dependent on latitude as it includes sin ϕ (where ϕ is the latitude). The Earth also acts as a giant centrifuge, whereby depressions tend to drift to higher latitudes while anticyclones move towards the equator.

In winter there is a huge dome of cold air over Asia which causes high pressure at the surface and low pressure at high altitudes. Corresponding to this setting, westerly winds prevail at high altitudes which reach their peak in the jet stream which average about 200 knots at 40 000 ft over Japan.

These westerlies can fluctuate from southwest to northwest. If they have a southerly component at about 5 000 feet they are blowing up the cold dome and produce rain in Hong Kong. If they have a northerly component the subsidence produces brilliantly fine weather.



Mr. Peterson (rightmost) at his birthday party at the Squire's Halt Restaurant on the Hog's Back in England in 2009

Another term in the equation was the centripetal force. This is only important when the isobars are very sharply bent. Round depressions it opposes the pressure gradient and very near the centre of typhoons it reduces the wind speed and accounts for a relatively calm eye. Normal anticyclones are too big for the isobars to be sharply bent.

In winter, anticyclones often break away from Asia and move southeastward causing extreme cold in Korea and northerly gales over the East China Sea. These cold north or northeasterly gales are funneled through the Taiwan Straits into the South China Sea. When I analysed one of these weather charts, there was a long cold nose of high pressure pointing towards Hong Kong, which one of my colleagues called "Peterson's nose". The end of the nose was sharply curved so that the centrifugal force increased the wind speed. There is another item in the equation called the isallobaric term. The sharp rise in pressure caused by the cold air also strengthens the wind. One other term in the equation was the frictional term. When the atmosphere is in a steady state the energy lost to friction must balance the energy gained by cross isobar flow. The effect is that over the open sea the wind blows at about 15 degrees to the isobars while over China which is mountainous the surface winds are very light and blow almost at right angles to the isobars from high to low pressure.

Mr. Peterson (second from left, first row), Mr. Gordon Bell (middle, first row), Director of the Royal Observatory and Mrs. Bell (5th from right, first row) together with other colleagues of the Observatory

Friendship of colleagues – Mr. Peterson met Mrs. Kaia Bell at the Squire's Halt Restaurant on the Hog's Back in 2009 on his eightieth birthday

Dr. P.C. Chin's Snapshots of the Royal Observatory

呂永康、林鄺泗蓮
Lui Wing-hong, Lam Kwong Si-lin, Hilda

錢秉泉博士(Dr. CHIN Ping-chuen)於一九五一年加入當時的皇家香港天文台，擔任學徒科學官一職，六十年代晉升為高級科學官，於七十年代後期退休，是本台首位華人科學官。他於二零一二年七月探訪天文台，向天文台同事講述他在天文台工作的寶貴點滴，其中包括他在天文台初期怎樣艱辛地工作，當時的工作環境及情況。錢博士的著作頗多、研究範疇廣，在多個領域為天文台奠下基石，例子包括航空氣象分析、寒潮的預測、可能最大降水評估、熱帶氣旋氣候資料等等。

In 1951, Dr. P.C. Chin joined the then Royal Observatory. He is the first ever Chinese Scientific Officer of the Observatory. Dr. Chin has broad experience in various areas of work of the Observatory, including aviation meteorological services, forecasting of cold surges, assessment of probable maximum precipitation and tropical cyclone analysis. His book, “Tropical Cyclone Climatology for the China Seas and Western Pacific from 1884 to 1970”, is an important reference on the climatology of tropical cyclones in the region. Dr. Chin was seconded to the World Meteorological Organization for five months in 1976, when he was appointed as the United Nations Chief Technical Advisor to WMO/ESCAP Panel on Tropical Cyclones in New Delhi, reflecting his reputation as a tropical cyclone expert in the international arena.

Mr. Graham Heywood (Director of the Royal Observatory 1946-1956) was the Director at the time when Dr. Chin joined the Observatory. Mr. Heywood originally opposed to the idea of employing local Chinese to take up the post of Scientific Officers. Fortunately, with the strong backing of Mr. Leonard Starbuck, who was the Assistant Director at that time, Dr. Chin joined the Observatory’s family as Apprentice Scientific Officer in 1951. He was sent to England to have his meteorological training at Imperial College for a year. Dr. Chin did very well in the College and was offered to stay on there for a year for research. Unfortunately, the Observatory was short of manpower and he was directed to return to Hong Kong to report for duty right after his training stint. Dr. Chin was promoted to Scientific Officer in 1955. He completed a post graduate M. Sc. Course at Imperial College under a scheme sponsored by the Sino-British Fellowship Trust in 1960. Dr. Chin was subsequently promoted to the rank of Senior Scientific Officer in 1966.

In the early days, Dr. Chin took up ‘morning’ forecasting duties, which started early at 5 a.m. As the transportation at that time was not as convenient as that of today without any cross-harbour tunnel, Dr. Chin had to travel from home at Mid-levels to Central by taxi, and then take a walla-walla (a kind of motorboat crossing the Victoria Harbour) to Kowloon and then take another taxi again from the pier to the Observatory. The early morning transportation cost him around $7 per journey against a monthly salary of $300 at that time. It was a six-day week and he had to spend more than half of his salary on transportation. This illustrated his strong commitment to working at the Observatory.

Unlike the modern facilities of the Observatory nowadays, working environment in those days had much to be desired. As the first Chinese officer working at the Kai Tak airport, Dr. Chin at one time had to contend with no access to lavatory during his shift because none had been built for Chinese officers at that time.

While Dr. Chin was working at the Airport Meteorological Office at Kai Tak, responsible for the provision of aviation weather forecast, Mr. Stan Giles of an airline company called one day and mentioned that two British Overseas Airways Corporation aircraft would arrive at 4 p.m. and pointed out that the forecast increase of wind strength at 4 p.m. in the aerodrome forecast prepared by Dr. Chin could not be accepted as that implied aircraft diversion would be required. Mr. Giles then called Mr. Heywood, Director of the Observatory on this matter directly but Mr. Heywood suggested him to trust the forecast. The outcome was that the forecast strengthening of winds was correct and Mr. Giles, out of respect for his professionalism, became a friend of Dr. Chin since then.

Dr. P.C. Chin (right) analysing the weather map (Courtesy of Information Services Department)

When Mr. Heywood left the Observatory in 1956, the Government announced that Dr. Ian Watts (Director of the Royal Observatory 1956-1965) from Malaysia Meteorological Service would succeed him as the Director. Before Dr. Watts reported for duty at the Observatory, Dr. Chin presented a petition signed together with other officers to request the Governor to rescind the appointment of Dr. Watts as he studied geography instead of meteorology. Dr. Chin was invited to meet the Governor at that time. The Governor explained to him face-to-face that the post assignment could not be changed. Despite the unsuccessful petition, Dr. Chin's outspoken attitude in voicing out staff concerns and his direct interaction with the Governor were pioneering at the time.

In the 1960s and 1970s, Dr. Chin worked with several senior staff who subsequently became Director of the Observatory, including Mr. Gordon Bell (Director of the Royal Observatory 1965-1981). According to Dr. Chin, Mr. Bell was a very clever person with great talent in public speaking and solving problems. Dr. Chin remembered that in a conference with engineers in which the Observatory was invited to give a talk on probable maximum precipitation estimation, Mr. Bell was able to talk eloquently about the importance of the subject for the engineering community for half an hour, before the arrival of Dr. Chin (who was late for some reason) in custody of all technical details.

As regards co-operation with other organizations, Dr. Chin mentioned that the Observatory and the University of Hong Kong co-operated during his time to set up a building structure mounted with anemometers to measure the wind flow around buildings. This was at the crest of the wave of the latest science and technology of wind engineering at that time.

Dr. Chin was instrumental in the acquisition of the first major computer, putting the Observatory amongst the earliest government departments embarking on computerization. He prepared the funding proposal and had to face queries about its justification. Dr. Chin still remembered the questions from Ms. Anson Chan, an official working on financial matters at that time, were what would be the expected improvement in forecast accuracy and the reduction in manpower, with the procurement of the computer. Dr. Chin explained that the computers would enhance the speed of the reception of weather messages which would save time for analysis. Interestingly enough, the same questions are still being asked nowadays when new computers are proposed. The Observatory subsequently established the Computer Division in April 1973. An IBM computer was acquired that year to decode meteorological messages, plot charts for weather forecasts and carry out statistical computations, modernizing the Observatory's operations.

Thanks to the efforts of Dr. Chin, firm foundation has been laid down in a wide range of developments of the Observatory. Dr. Chin is now enjoying his retirement life in Canada, but will occasionally come back to Hong Kong. We wish him all the best and look forward to meeting him again to learn more about the very interesting past of the Observatory.

Director (C.M. Shun) presented a staff group photo taken in the 1960s to Dr. Chin during his visit to the Observatory in July 2012.

What Did We Do after Duty?

鄺煥培
Kwong Woon-pui, Louis

鄺煥培先生為退休的總學術主任，深深領會天文台是個忠於所托兼且有歸屬感的政府部門，同事除了工作上的接觸外，下班了總再聚頭參加不少運動項目。當年雖然人丁有點單薄，同事們的團隊體育精神寫下輝煌的一頁，與近年來天文台在公務員優質服務獎勵計劃及資訊科技等領域所獲獎項互相輝映。

I understand that the Hong Kong Observatory (HKO) has in recent years won quite a lot of honours and awards in various scientific aspects. It must be a great achievement and pride for a relatively small government department. It has always been my opinion that the Observatory does not look like a typical government department at all – no abuse of power by the officials or staff, nor any aggressive confrontations with the general public. On the contrary, there have been cases of verbal abuse on the staff by some citizens. The Observatory appears more like a closely knit community with a *semper fidelis* feeling, the 'always faithful' sentiment with a sense of belonging, as every member practically knows and co-operates with everyone, and more importantly maintains some sort of contact with each other or the office even after duty. In respect of this feeling, I would therefore like to take this opportunity to mention some collective achievements not related to meteorology but in sports.

Despite a limited pool of human resources, our colleagues have in fact done quite well collectively as a team in many sports. I shall confine my brief account of their activities to the era from the sixties to the early eighties in the previous century when the Hong Kong Observatory was then still known as the Royal Observatory (RO). Football was probably the most popular sport among our colleagues. Indeed, there were many good footballers such as Messrs Lo Gun, E. Chan and in particular Q.T. Lee whose father and brother were both renowned Hong Kong footballers. There was an official RO football team which welcomed every staff member to join and play. Matches with other government departments or other public institutions were regularly organized, though there had never been any inter-government football tournaments. Any team member not on duty would be given a shirt with RO initials to wear as well as a chance to play on the field. Unfortunately I do not have any photograph showing the RO football team in action.

Apart from football, we also had an official basketball team which was formed mainly to take part in the annual tournament which was first held probably in the late sixties or early seventies by the Credit Union League of Hong Kong. Limitation of physique and shortage of players had restricted our achievement. Although we had never been able to get to the top positions in the tournament, we had managed to grab some wins over weaker opponents. Perhaps it looks slightly comical that some of us were wearing glasses. It is fortunate that there had never been any serious accident. The picture below was definitely taken before 1975, but I apologize that I have lost track of its exact date.

Standing first from left: Edmund Chu, front row third from left : W.P. Kwong

Ten-pin bowling began to become popular in Hong Kong in the late sixties. Some of our colleagues began to form a private team to play in various tournaments sponsored by the commercial organizations. In 1969, the first commercial supersonic airliner, Concorde, launched its first trial flight. In the following year, in order to celebrate the successful test flights of Concorde even though it had not yet come into commercial service, Jardine Pacific which was handling all air flight operations and planning for BOAC (British Overseas Airways Corporation), now renamed as British Airways (BA), sponsored a Kai Tak Supersonic Bowling League. The tournament was open not only to all airline personnel but also to staff of government departments with offices at the Kai Tak Airport. Naturally we were interested, but owing to a lack of qualified players, we had to join forces with colleagues from the Civil Aviation Department (CAD) as a single team representing two government departments in order to compete in the team event. On the whole, we played pretty well and managed to win the plaque of the First Runners-up as well as a trophy of the Highest Series. The Supersonic Bowling League was unfortunately, I believe, discontinued next year.

Third from left: W.P. Kwong with CAD colleagues

In the early sixties, the tennis facilities of the Hong Kong Chinese Civil Servants Association (HKCCSA) at Wylie Road, King's Park, attracted many colleagues to play tennis there regularly. In 1973, the HKCCSA, with the sponsorship of Mr Henry Fok, held its first tennis tournament which then became an annual event. The singles and doubles matches were open only to its members, that is, Chinese civil servants who were also members of the HKCCSA. In the team tournament, however, the HKCCSA membership of players was not required – their civil servant identities would suffice. In a team match, opposing departments had each to name six players to play a round-robin doubles game for three rounds. There was a problem with our team as our resources of player were limited. In addition, many of our players were not only working on shifts, but also belonged to the same rank. Therefore we often had to seek the favour and co-operation of other colleagues to swap duty whenever a match had been scheduled on the day of duty. Fortunately the *semper fidelis* spirit would often kick in and most of the time we were able to swap duty and play the match.

Age has probably got in my way and I have no recollection of the results of the first three tournaments from 1973 to 1975. It is unfortunate that the HKCCSA has not kept any record of the tournament results. Nevertheless, there is no doubt that we had our luck or perhaps were in peak form in 1976 when Mr Edmund Chu, representing the Royal Observatory, lifted the team championship cup from the hands of Mr Henry Fok. It must be a glamorous moment of joy and pride for all RO team members.

From left: W.P. Kwong, Mr & Mrs Edmund Chu

We still played pretty well in the following year but luck was not on our side this time as we were beaten narrowly in the final and could only end up as the first runners-up. Despite our disappointment, we felt much honoured that Mr Gordon Bell, the then DRO, agreed to receive the trophy on behalf of our department.

Third from left: HKCCSA representative, Gordon Bell, Henry Fok, W.P. Kwong

I am unable to recall what we had achieved in the following year, though it seems more likely that we failed to go to the final. In the seventh tournament held in 1979, however, we re-grouped ourselves and once more brought home another first runners-up trophy. This time we had Mr Peter Li Chung Sum to represent our department to receive the trophy from Mr C.T. Fok, son of Mr Henry Fok.

Standing : Peter Li (fourth from left) and C.T. Fok (third from Peter Li)
Front row (from left) W.P. Kwong

Thereafter as the sport of tennis gradually became even more popular in Hong Kong, there was a surge in team entries into the annual tournaments. It therefore became much tougher to get to the final rounds. Besides, the RO players were gradually going downhill with age. As far as my memory goes, we no longer were able to take home another trophy under the team name of Royal Observatory, though we might have achieved something like the second runners-up in 1985.

Sadly the HKCCSA has ceased organizing any tennis tournament since 2007. In view of this, it makes us feel even prouder that we were able to have achieved something for the department outside meteorology and brought home at least three trophies for display at the club house. The more important thing is, of course, the pride and honour felt by our colleagues to be able to compete under the department's banner. I am looking forward to hearing of more successes in sports by our young colleagues.

「朱 Sir」- 天文台在國際海洋氣候工作的老大哥

莫慶炎
Mok Hing-yim

Mr. HY Mok, Senior Scientific Officer, told the stories of Mr. Chu Wing-kee, Edmund, who retired in 1988. He recalled that Mr. Chu was his very good mentor when he was a forecaster at the Central Forecasting Office. More significantly, Mr. Chu was the first officer of the Observatory to take up the chairmanship of an expert group of the World Meteorological Organization back in 1972. Mr. Chu's achievement exemplifies the unique role that Hong Kong could play in the international arena.

When this article was being finalized, we received the very sad news that Mr. Chu had just passed away in early December 2012. While many of us will be missing him in the years to come, we are also hopeful that this article will help colleagues and friends remember him personally and recall his contribution to the Observatory. Our very best wishes for Mrs. Chu and his family.

於1988年退休的「朱Sir」朱榮基先生是筆者（莫慶炎）初入天文台當預報員時在「天氣預報中心」工作的其中一位高級科學主任，在他的帶領下，曾共同面對過不少的惡劣天氣。無論天氣如何惡劣，情況有多緊急，只要有經驗豐富、身型魁悟的「朱Sir」坐鎮「天氣預報中心」，心裡自然踏實，不慌不忙便可以應付過去。雖然「朱Sir」已退休二十多年，還不時記起「朱Sir」當年雙手握於寬厚的背後，昂首參詳掛在架上的高空流線圖，以及手執鉛筆和擦字膠教筆者畫「850百帕高空流線圖」的情景。當然還有他的隨和及從不擺上級架子的性格，至今仍歷歷在目。這位亦師亦友的老同事今年已年過80了，從近期探望過「朱Sir」的同事口中得悉「朱Sir」仍然精神健旺，思路清晰，相信他仍然沒有忘記在天文台渡過的二十多個春、夏、秋、冬，及當年這個初出茅蘆的小夥子。在探訪期間，「朱Sir」就他在天文台曾參與過的工作及經歷均能如數家珍，侃侃而談。尤其在憶述到他在1972-1981年間連任兩屆世界氣象組織（WMO）「海洋氣象學委員會」的「海洋氣候工作組」主席的威水史時，振奮之情完全浮現在他那慈祥的臉容上呢！翻查了一下天文台的歷史，原來「朱Sir」更是首位在WMO的專家組擔任主席的天文台人員，這確是值得他感到自豪的。

在1964年加入天文台任職科學主任前，「朱Sir」曾先後在加拿大亞伯達省氣象所工作及在香港理工學院（香港理工大學前身）當過講師。加入天文台後，「朱Sir」初時在啟德機場氣象所擔任航空氣象工作，其後調職到當時的海洋氣象部組負責海洋氣象服務，並擔任海港氣象主任。入職天文台初期，「朱Sir」便已經參與上天下海的工作了。

自1883年成立以來，為遠洋輪船提供海洋氣象服務，一直都是天文台的首要工作之一。在1949年，天文台開始招募了一

隊志願觀測船隊，提供海洋上的氣象觀測資料。該些資料對分析天氣系統、制定海洋區域天氣預報和及時發出颱風警告非常重要。基於天文台在海洋氣象服務的經驗和貢獻，在1963 年 WMO「海洋氣象學委員會」設立「海洋氣候摘要計劃」時，以天文台為代表的香港已成為 WMO 指定全世界八個收集海洋氣象資料及編纂「海洋氣候摘要」成員其中之一(其它成員為美國、英國、德國、日本、俄羅斯(1992 年前為蘇聯)、荷蘭及印度)。香港的負責範圍是由赤道至北緯30 度及由東經100 度至120 度的部份。在 WMO「海洋氣候摘要計劃」的安排下，天文台檢定香港志願觀測船舶天氣觀測報告的質量，然後在英國和德國的全球資料收集中心協調下與各成員交換資料，運作至今。

在1972 年，全世界八個收集海洋氣象資料及編纂「海洋氣候摘要」的 WMO 成員代表在東京舉行 WMO「海洋氣象學委員會」第六次會議。由於當時「朱 Sir」負責海洋氣象服務的工作，因此被委派代表天文台出席會議。在出發時，「朱 Sir」只是抱著參與的心態出席會議的，但結果卻出人意表，在會上被推選為「海洋氣候工作組」的主席，其後更連任一屆至1981 年。雖然事隔多年，在說到這個機遇時「朱 Sir」還表現得有些雀躍，因為他畢竟都是首位在 WMO 擔任工作組主席的天文台人員呢！在談到事情的始末時，「朱 Sir」表示個中原因亦不能肯定，但猜想應該是和當時東西方冷戰時期的微妙國際政治環境和香港的獨特位置，以及天文台在海洋氣象服務所作出的努力有關。例如早在1960 年代，天文台便已將香港志願觀測船舶手寫的氣象觀測資料製成以電腦穿孔卡形式儲存的數據，並與從香港負責範圍內各國氣象中心交來的電腦穿孔卡一併處理，經電腦程式對數據作出品質檢定後匯編成氣候摘要，與所有 WMO 成員共享。在當時的政治背景，共享敏感的信息並不普及，香港率先與所有 WMO 成員共享海洋

氣候數據，成為了世界典範。由此可見，香港在地球上雖然只是彈丸之地，但在適當的時間及環境下，只要本身有實力及努力亦可以發亮發光，在國際舞臺上擔當領導的角色。「朱 Sir」被推選為 WMO「海洋氣候工作組」的主席便是一個好好的例子。

後記：筆者完成此文章後以電話聯絡「朱 SIR」後郵寄文稿請他提意見。當時「朱 SIR」仍聲如洪鐘，之後更親筆回信給我。看著「朱 SIR」的筆跡時，心中還盼望著在天文台130 周年慶典可以再與闊別多年的老同事聚首，不幸「朱 SIR」於 2012 年12 月初因病去世...... 不勝唏噓之餘，只有借此一角，表達對「朱 SIR」的尊敬、懷念，以及回顧他對天文台所作的貢獻。

身為 WMO 海洋氣候工作組主席的「朱 Sir」（右一）主持會議

「朱 Sir」（左一）在工餘時與同事共享郊遊樂趣

台長岑智明 及助理台長劉心怡 、黎守德 於 2012 年中探訪「朱 Sir」（右二）

回顧

梁君碩
Leung Kwan-shek

Mr. KS Leung, former Principal Experimental Officer at the Observatory, writes and sings about his career development starting from the rank of Scientific Assistant to become the officer-in-charge of the Airport Meteorological Office (AMO) before his retirement. He was determined to rush back to the AMO at Chek Lap Kok in the midst of his duty visit in Guangzhou right after he received a phone call from the office about the tragic flight landing in 1999 during a typhoon. He likes weather forecasting and currently his proficiency comes in handy in advising a down-to-earth client, his wife, about drying of clothes under the sun.

在天文台任職科學助理不足兩年結婚，婚禮當天懸掛 8 號風球，犯境的是一強颱風！是在十一月啊！認真賞面。當天剛接了太太回家，隨即有郵差帶來天文台寄出的掛號信（可能是因我告了假），是部門約見有關遴選科學助理往英國受訓。最後選了我和另一同事前去，是結婚後不到 3 個月。後來兒子出生，最先恭喜我的人是我的同事和蘇格蘭格拉斯哥機場氣象所的職員。

"昨天有什麼發生？現在正在發生什麼？"就是在英國的氣象局學院受訓期間，一位導師教導我們如何處理氣象分析的其中一個方法，他們亦不時強調警覺性，這對我日後在參與天氣預報工作的幫助頗大。回港後在天氣預報中心實習期間，印象較深刻的是一位預報員曾就氣象分析及天氣會議中簡報的技巧給予的指導，自己亦不時作事後分析。當時的天文台台長對預報員的警覺性要求甚高，作為一個新人來說，可以有好好的機會鍛鍊自己。

隨後的工作主要是作為總部預報中心助理預報員參與天氣預報及在機場氣象所發送飛行氣象文件予航空公司，少部份時間在其他部組中，而我的興趣則在前者，因為在天氣預報工作中可以不時與預報員討論。若天氣預報準確且理由充分則感高興，倘預報錯誤，若有所失之餘卻可增添自己的經驗。在那些年代，我們是單獨一人在天氣預測總部當夜更，必要時可與機場氣象所的航空預報員聯絡，如此容易積聚實踐經驗。

一次很突然的機會我接受電視台採訪，有關颱風影響香港的情況，事前是沒有預備我去做的。當時電視台需要粵語及英語採訪，英語方面由英藉天文台長負責，而粵語方面，則由於當時的天氣預報員不便去，就祇好臨時找我頂替。很快決定好，一眾人等就趕去會議室，一到達，台長便站在鏡頭前準備，當時我很快要決定先細聽台長所說，再即時譯成中文，以備不時之需，因為

恐防我沒有時間再問他該說些甚麼。果然台長講完立刻就到我，就這樣我經歷了唯一一次的電視採訪。

在天文台最後的十年左右再沒有直接從事天氣預報的工作。而在最後的五、六年要參與機場氣象所管理策劃的工作，是最忙碌及緊張的時期。此期間內，很快便熟習了 " 延遲 " 代替 " 準時 " 下班。首先是準備機場氣象所由啟德機場搬遷到赤鱲角機場。隨即要面對確保各系統操作過渡公元二千年的挑戰。計劃成立備用控制塔的輔助機場氣象所，當控制塔發生事故時，天文台的職員便移師至該氣象所繼續運作。 同事門需時熟習新環境及大量的新儀器，因此在工作上儘量不讓他們承受過大的壓力。

機場氣象所搬到赤鱲角約一年多，一次到廣州準備與中國空管局的人員會面，當天下午雖已發出 8 號烈風信號，我們仍按原定安排乘直通火車往廣州。黃昏抵達住宿酒店門前，正想進入時接到機場氣象所來電：「C-R-A-S-H！儘快返回赤鱲角。」有飛機發生意外，於是立即頭也不回，在附近乘搭巴士輾轉返回機場氣象所，抵達時已是午夜，就此匆匆結束港穗一圈遊。

在任的最後一年更要培訓高級學術主任，以接替總學術主任負責機場氣象所的航空預報員的工作。根據國際民航組織在二零零一年的建議，天文台要為航空氣象服務進行 ISO 認證，揀選了管理顧問公司為航空氣象服務發展一套品質管理的文件及系統。

在以上百忙中，幸好有熱心的同事多多幫忙，但同時亦有時在匆忙中而不經意地開罪了一些同事，在此僅望他們見諒。

原諒我這一生不羈放縱愛自由，也會怕有一天會跌倒

一天，事前沒有人通知我，一位年青人，穿了一身筆挺深色西裝，結了領帶，走進我的辦公室。是夏天，所以我穿的是短褲長襪，毫無準備給他闖個正著，我放在辦公室的後備衣服也無用

武之地，此等尷尬場面從未發生過也終於發生了！

接著他很有禮貌地告訴我他是部門新請來的學術主任，是被安排在我那裡上班的。

第十七次航空氣象服務聯絡組會議成員歡送梁君碩（中）

外貌早改變，處境都變，情懷未變

「這裡是民航處指揮台，請問現在這場大雨會持續多久？」

「根據雷達影像顯示，大雨將會再持續約 30 分鐘，然後雨勢會明顯減弱。」

退休後：

「衣服已洗好，趁現在有太陽，將衣服掛出窗外晾曬吧！」太太說。

「天文台雷達顯示半小時後有雨，會持續約 1 小時，稍後再晾曬吧！」

我在天文台的四十年生涯

溫彪
Wan Bui

Mr. Wan Bui is one of the longest serving colleagues of the Observatory, who recently retired in July 2012. In this article, he shares his memory of the changes and advancement in the computer operations of the Observatory, starting from the early stage of computerization work in the 1970s. He also provides an insight of how the Observatory's staff faced the challenges arising from the advancement of technology, with the aim to meeting the increasing demands for weather forecasting and other new services of the Observatory.

在我四十年的天文台生涯中，超過三分之一時間是在電腦部渡過的。雖然對於早期電腦部的記憶已開始變得模糊，印像中，當年的操作員工作，還是充滿樂趣和挑戰的。

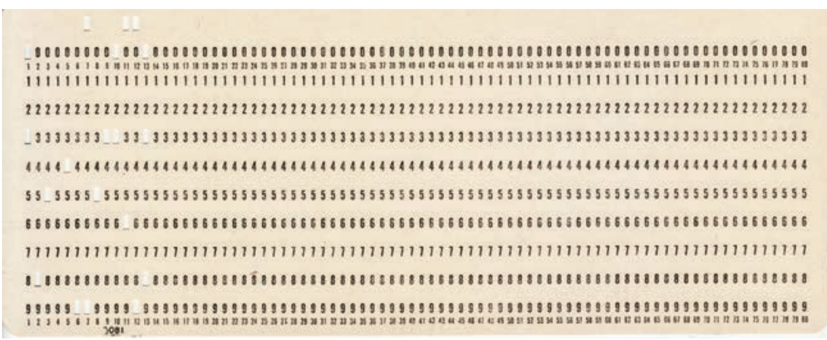
大約在1977 年秋天，當時我還在飛鵝山雷達組，偶然見到內部公文說電腦部需要科學助理當冬季臨時工，雷達組冬天因機器維修的關係，不需要輪班工作，過剩的人手便要另覓歸宿了。所以我在完全不知道電腦是什麼東西的情況下便報名。當然跟著是臨急抱佛腳到圖書館借電腦參考書，希望面試的時候不會啞口無言。面試的時候見我的是鄭少明先生（當時他是高級學術主任，署理電腦部主管）。我們的談話基本上與電腦無關，似閒話家常多一點。心想面試結果都是凶多吉少，怎料到，數天後便接到通知，我要在電腦部過冬了。

最初的天文台電腦部座落於1883 大樓後面的側樓(Annex Building) ，即二樓圖書館旁的兩個房間，除電腦部外，二樓還有水文組，圖書館及高級科學主任的辦公室，至於電腦部則有科學助理作為操作員在電腦室工作，學術主任（大約三人連主管）作為程式編寫員在另外一個房間工作。除了操作員外，其他同事都是朝九晚五上班的，所以在辦公時間以外，整座大樓便祇有操作員和電腦。

當年的電腦是IBM 1130 和SYSTEM 7，那些電腦都有一個特色 － 體形龐大。以1130 為例，有一張傳統大型政府寫字檯的大小，而SYSTEM 7 佔約一個入牆衣柜的體積。聽師兄們說，因為體型龐大，運送時要出動吊臂車將電腦吊上二樓，還要鑿開二樓走廊的一個缺口才可以將電腦順利送入電腦室（現在側樓二樓走廊盡頭的鐵欄，便是當年運送電腦而要鑿開的缺口）。

現時在側樓圖書館外走廊盡頭的鐵欄，是當年用來運送電腦的缺口

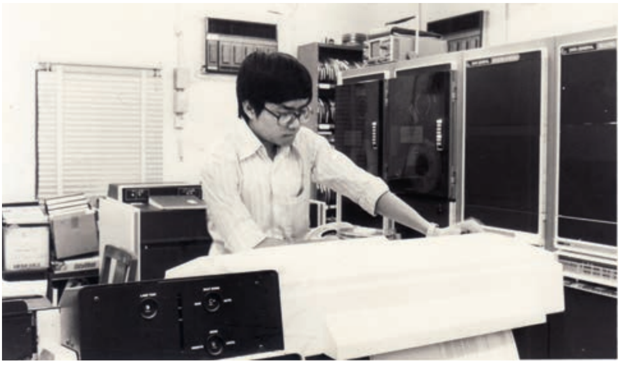
雖然電腦體型大，但記憶體及磁碟儲存量，比起現在就小得可憐。IBM 1130 和 SYSTEM 7 各有 64 KB 而後來的 ECLIPSE 就有 1 MB。磁碟方面，1130 有兩座磁碟機，磁碟好像鐵餅一樣有 0.5 MB，至於 ECLIPSE 的磁碟機更誇張 — 好像一台洗衣機的大小，當然容量亦相對大得多，有 96MB。輸入電腦是用讀紙帶機和終端機一些比較原始的方法。打字機是將資料，包括電腦程式用打孔的方法記錄在一張 80 COLUMN 的卡紙上。紙帶是從大東電報局收取的世界各地的記錄紙帶，我們操作讀卡機和讀紙帶機時都需要十分小心及專注，不然卡紙掉到地上或紙帶斷了便十分麻煩。當年的電腦語言是 FORTRAN 和 ASSEMBLER，一個普通的程式大約需要一百到三百張卡，如果用 ASSEMBLER 或複雜的程式的話，我們是用厚度而不是用張數計算的。



天文台在七、八十年代用來儲存資料的 80 COLUMN 的卡紙

操作員的工作包括起動電腦、更換磁碟（因為容量小的關係，不同的資料會儲在不同的磁碟上面，在執行程式之前，我們要確保所需資料的磁碟是連線的）、執行資料備份，備份是用磁帶的，磁帶的就好像那些古老錄音機一樣，是一餅餅的；還有將所有在辦公時間未能處理的資料和程式，在晚上執行，因為輸入程式可能需時十數分鐘到數個小時不等。所以學術主任們編寫程式時都十分小心，盡量避免不必要的錯誤。可能因為人數少的關係，師兄們對我提出關於操作上和程式編寫的問題，都十分樂意與我分享心得，而主管亦給我機會編寫程式。於是我開始培養了對電腦的興趣。在冬季結束時，便要求繼續留在電腦部。而我的請求又被接納，代表我多姿多采的電腦部生涯的開始。

一年之後，IBM 漸漸淡出，換入了 DATA GENERAL 的 ECLIPSE S/130 和 S/140，體型仍然龐大，不過繁複的卡片和紙帶亦開始被淘汰。因為加強了電腦能力，所以很多新產品便逐步開發用以支援天氣預測，其中包括計算大範圍的氣温、氣壓、記錄各地氣象站的雨量、風向、風速、計算颱風路徑等。所有產品都是用列印機印出來 — 用點代表海岸線，用字母代表等值，所以產品是一堆堆的點和字母，操作員要先將海岸線連起來及將相同字母（代表等值）用顏色勾畫出來，才可以拿到預測總部。過程就像現在幼稚園及小學生常玩的連點遊戲。



天文台電腦操作員正在操作繪圖機繪畫天氣圖

隨著天文台在 80 年代開始規劃百週年大樓，電腦升級計劃亦在主管們心中醞釀，在 80 年代中期他們決定用 DATA GENERAL 的 MV 20000 和 MV 15000 取代日漸老化又能力不足以應付其他各部組越來越多的電腦應用要求，電腦語言亦由 FORTRAN II 升級至 FORTRAN 77。在新的電腦正式要安裝前數個月，我要和另一位同事，差不多每天都要拿著記錄程式的磁帶，由尖沙咀到北角的電腦公司，用新機進行程式測試、修改，及將新舊機得出的結果互相對照，以確保原有的程式可以在新機正常地運行。

新的電腦部在百週年紀念大廈五樓，整個北翼是電腦室一包括主機房，磁帶儲存庫及電腦終端機室（那裡放置了三至四部終端機連線到主機供其他部組使用）。南翼佔一半是主管及程式編寫員辦公室。

隨著電腦應用的普及，天文台其他各部組亦開始用程式處理資料，製作圖表，所以我們的工作變得更加繁忙，除了原有的操作員工作外還要負責維持電腦終端機室的秩序，為他們編排使用時間，及處理他們吩咐的工作和通知他們取回工作結果。

筆者於 1980 年代正在使用 DATA GENERAL 電腦終端機輸入指令，指示電腦工作

在這期間，電腦部添置了繪圖機，將以前列印出來的產品圖像化，我們再不須要玩連點遊戲了。有了新的繪圖機我們開發了新的高空風向風速圖，包括垂直空間序列圖(SPACE CROSS SECTION) 及時間序列圖(TIME CROSS SECTION) 等，服務對象除了預測總部外還有當年在啟德機場的機場氣象所。

80 年代中期，網絡亦開始在天文台應用，各部組可以在自己部門添置終端機用網絡連線到主機，他們再不須要到五樓排隊用電腦，雖然他們仍然要到電腦室外取回結果，因為祇有一台中央打印機的關係。

我是在1986 年離開電腦部，調到空氣污染氣象研究組，直至1993 年才調回電腦組，之後電腦組由學術主任主管的年代變為由科學主任掌舵的部組，不過，那是另一個故事了。

工作之外

楊繼興
Yeung Kai-hing

Mr. KH Yeung, retired Assistant Director of the Observatory, recalls various staff recreational activities as early as in the 1970s with many memorable photos reminiscing those happy times and crediting the harmonious workplace at the Observatory.

筆者天性疏懶，不太喜歡工作，不過在職時往往給人一個頗為勤力的印象，其實是自知缺點，糾枉過正所產生的一個假象，今次應邀寫一篇想當年，因為不限題材，故此決定不寫工作，只寫工作以外的康樂活動，寫的不是本人的活動，也不是其他個別員工的活動，而是眾多員工參與的集體活動。

唯一一個年年舉辦而參與者眾多的活動是聖誕派對，一般在聖誕前夕或之前一兩天舉行，它的形式於1984 年有一個明顯的改變。在此之前，台長都住在天文台總部內的宿舍，聖誕派對就在台長宿舍內舉行，派對時間一到同事就放下手上工作走到台長的宿舍叩門而入，而台長就以酒、汽水和零食招呼眾人，互祝聖誕快樂之後，同事們就三五成群的飲酒談天，台長家人不時穿插人群之間，遞上薯片、果仁款待眾人，氣氛歡樂親切，擾攘約一個小時眾人又陸續告辭離去。1984 年岑柏先生升任台長，選擇住在港島原居所，不遷入天文台總部內的宿舍，而剛巧早一年『百週年紀念大樓』落成，有一個大會議廳可供多人聚集，聖誕派對從此就在會議廳和鄰近的空地舉行，節目也一年一年的多起來，近年派對就有台長致辭、各種各樣的頒獎、午餐、遊戲和抽獎等節目，歷時兩個多小時，氣氛歡樂熱鬧，但也不要以為以前在台長家的派對就很平淡，當年招呼客人的是烈酒，個別好酒的同事喝下兩杯就情緒高漲，高聲講大聲笑，氣氛也很熱鬧。

記憶所及，天文台職員會只辦過一次香港境外的旅遊，1978年底中國開始改革開放，旅遊限制隨之放寬，在此之前，一般香港人不易到內地旅遊，去的主要是探親。天文台職員會趁風氣之先，於1979 年與廖創興銀行合組旅行團暢遊桂林、從化和廣州，二十多名團友約一半是天文台職員，是最早欣賞到內地湖光山色的一批香港人，有照片為證。筆者當時是職員會會長，但不要誤

會筆者有如此創意和能力，其實組團的構思來自林超英先生（前台長，當年任高級科學主任），其後的聯絡和組織工作也是由他主導，筆者照他的計劃行事而已。

1979 年桂林遊

1983 年 3 月 23 日天文台乒乓球大賽

不少天文台員工熱愛運動，不過部門的福利資源有限，台內體育設施極少，多年來就只有一張乒乓球檯，午飯時間及下班後總有同事打球，全盛時期是 80 年代，常常打球的同事有十多名，職員會每年舉辦乒乓球比賽，球技較高的同事還組隊參加公開賽，可惜成績平平，皆因天文台隊員都未受過正規訓練。至於部門內的年度大賽，偶然有球場稀客參加，照片所示的混合雙打比賽，就有掛拍多年的岑柏台長（右一）參賽。奇怪的是，在 80 年代末眾人打乒乓球的熱情一夜之間完全消失，人去檯空，十多年後才再有同事打球，但無復當年盛況，箇中原因筆者曾有猜想，但因為從未求證，不說出來了。

足球、籃球和羽毛球也是不少天文台員工喜愛的運動，愛好者工餘常相約租用外間場地切磋球技，近年職員會或儲蓄互助社更舉辦年度比賽，讓各科健兒一較高下。

一些較難上手的運動或文藝項目，如果有足夠的同事表示興趣，職員會會嘗試邀請或聘請名師開班教授，過去曾經辦過的學習班很多，印像之中日文班、太極班及書法班最受歡迎，後二者曾連續舉辦多年。

不少天文台中人喜愛郊遊行山，相熟的同事不時相約出動，近年職員會也組織同事行山，多是響應公益金和其他機構或團體發起的步行活動。值得一提，一些已退休的天文台員工尤愛行山，組織最具規模的是前總科學助理呂友樂先生及林金照先生主持的行山隊，每月行山兩三次，足跡遍港九新界，每次參加者十至三十人不等，部份是退休同事的家眷親友，偶然尚有在職天文台員工參加。

以上所講的都是記憶中的見聞，遺漏偏差難以避免，但從中已不難看到天文台員工好動而興趣廣泛，工作之餘不忘娛樂，而且彼此相處融洽，天文台實在是健康工作場所的典範。

退休同事組成的行山隊於 2011 年 11 月 29 日由烏蛟騰行往鹿頸途中（前高級科學主任譚焯明博士攝）

Must be Born that Way

張文瀾博士
Dr. Chang Wen-lam

二零零六年十月十日，高級科學主任張文瀾退下了火線。

雖然退休後健康出了一些問題，他仍然自強不息，在網上自我學習，並在二零一一年九月，欣然重返天文台主講了一課微氣象學。

在職時，張文瀾博士參與了預測、氣象和氣候多方面的工作。科學以外，他得意之作，是在二零零三年作為傳訊部主管與同事策劃了天文台四位氣象專業女性的新聞發佈會，讓市民認識了她們在氣象領域對科學和社會的貢獻。

這位綽號「老佛爺」的前同事，在他的短文裡以幽默、輕鬆及綽越的文筆坦然笑談工作和感想，分享了他獨創的辦公室口頭禪，以及他觀測微氣象的心得。

With “*don’t do today what you can put off till tomorrow*” as motto, I never doubted that my comeuppance will catch up with me sooner or later. But I never thought that it would be later!

Why did it not strike when I was on duty, heavy rain all around ready to pounce like hungry lions and I was wound up tight as a drum? Someone must have tamed the ferocious creatures. Who was it in the Sunday school stories I read years ago? How does Elton John’s song go? *It looks like Daniel, he knows more than I, must be the cloud in my eyes?*

Why not when I was lost in the wonderland of high-technology, a migraine from alarms sounding from advanced information systems left and right? Fended off not by the many pain killers I took, but surely a good queen navigating me through the maze of instructions and warnings!

And in the gentle, hospitable way colleagues prevented this wobbling lumbering Chang from being an elephant in a China shop, undoubtedly there was something clearly Thai.

Also, how not to risk reputation and dignity handling the media? Luckily with four lovely lady colleagues at the point, I in the lee, it was - how does one say – simple as pie? No, easy as gin!

Meanwhile, on my own desk there were seasonal forecasts and climate change to tackle. Thus, vying for attention was the whole spectrum of time scales from hours and days through months and a year to decades. Plus hydrometeorology, port meteorology, dispersion meteorology, tropical cyclone and consultant reports etc. at one time or another. A number of colleagues had asked how did I keep the lid down, each more or less a considerable subject in itself?

(From left to right) Annie YY Mak[1], Sharon SY Lau, Sandy MK Song and Christina SW Yeung

With great difficulty, I replied. And much satisfaction as fortunately, every Goliath has its David. Perhaps also those at the top of the hill had sagely given me good feng shui (風水 - I suppose it is de-rigeur to mention in this business). So, with the right blend of the feminine Yin (陰), the masculine Yang (陽), and fine Chi (氣) - atmosphere and chemistry in technical jargon - I could do what I do best. That is, breathe down everyone's necks!

No wonder I came down with a heart attack in August 2007, about 10 months into retirement. Talk about comeuppance! There is justice in the world after all. Rain is without blame. I am still kicking today (sorry!) only for the great skills of the doctors,

[1] *has left the Observatory and joined the Civil Aviation Department*

and the good grace of the Almighty. But for me, romantic is the notion “Should I fall”, cherished since boyhood. Really can’t ask for anything more. True to form - even less young, even more foolish!

I thus can wear my comeuppance gladly and proudly as a badge of honour. I never leave home without it, my tribute to colleagues who had kept me out of harm’s way as well as helped me achieve professional closure in everything I was instructed to or set out to do. In the way of a draft section – albeit very small - for the then Director’s input to the Intergovernmental Panel on Climate Change’s 2007 Fourth Assessment Report, I can even brag something about an inconvenient truth. Bliss!

Despite all my huffing and puffing, in a Kelvin-Helmholtz-like moment (of instability), it was let known to me that I was given the moniker “Old Buddha” or “Lo Fatt Yea”. “*Lafayette*”? As in the French general who fought in the American Revolution? Call me by my moniker anywhere, anytime!

With such a gracious moniker you can appreciate that there can hardly be any element of truth in I reportedly being the originator of the following one-liners in intimate tete-a-tetes:

From bosses: *“Which part of my instruction do you not understand?”*

To peers: “*Colleagues like you, who needs friends?*”

To subordinates: “*Why die young?* ”

Yes, don’t die young. On the other hand I heard *Queen* in the *Highlander*. Who wants to live forever? So, if it is any comfort I have begun working on my epitaph. It begins “*Here*

Happily Rests the Remains of ……...", and ends "It has indeed been a privilege". Suggestions anyone?

In the remains of my day colleagues had kindly called me back to duty to keep my adrenalin flowing and help me recover. It was therefore with great delight that in September 2011 I gave a talk on micrometeorology in an Observatory forum relating to Fukushima. Hopefully I was able to tell colleagues what I knew in the easy cool way that the subject was first taught to me.

Namely, feel the sun (vertical transport and convective turbulence), catch the wind (horizontal transport and mechanical turbulence), and see the clouds (rough estimate of mixing height from cloud base). I still do but still somehow, I really don't know clouds, at all. You know the Burt Bacharach song!

With duty answered I could again walk into the sunset. Like Kermit the Frog I might one day find the rainbow connection for lovers, dreamers and me. La la la la, Laa Laa Laa Laa….

See, see, I must be born this la-di-dah way. Guess what, I won't have it any other way!

"將軍"的尖兵

譚焯明博士
Dr. Tam Cheuk-ming

Tseung Kwan O, known as Junk Bay in the past, developed from a rural area in the 1980s to currently a convenient new town. Dr. CM Tam participated in meteorological studies of Junk Bay by the Observatory's Air Pollution Meteorology Research Unit in the 1980s. The main objective of the study was to assess the air pollution dispersion potential of Junk Bay and to prepare local meteorological information necessary for the investigation of environmental impact of existing and projected industrial developments within the area. The information also provided meteorological details essential for various experiments and air quality studies conducted in Junk Bay.

那天有事要到將軍澳，真的久違了。步出地鐵站，抬頭一看，四周的高樓大廈令我吃了一驚。

腦海中，八零年代初的將軍澳還是一個人煙稀少及有着青山綠水的海灣，當時該處人口不足一萬人，而大部份居民都是住在調景嶺的寮屋區，往來市區的交通極之不便，出入只靠一條攀山越嶺及迂迴曲折的安達臣道。1982 年香港政府落實發展該區為新市鎮，人口目標為四十萬以上，前期工作包括完善新城市的規劃，以減少日後工業對居民所造成的影響，確保該區的空氣質素。而為配合這個項目，天文台成立了空氣污染氣象研究組 (Air Pollution Meteorology Research Unit (APMRU))，為落實將軍澳區的長遠發展奠下了重要的基礎，而我當年亦有幸加入成為該研究組的一份子。

我的首項任務是做個天氣探子（尖兵），打頭陣帶隊到將軍澳作出一系列的科學研究，包括氣象測度及收集數據，用來計算將軍澳區內空氣的擴散潛力，以用作對近地面污染濃度作出評估。而這計劃亦得到靈實醫院的支持，讓天文台在院裡安裝香港首部聲波雷達及小型自動氣象站，每天不停地收集資料以作分析。同時，組員亦需要每星期在該區利用飛船量度氣温、濕度和風的垂直廓線，以作出一個三維空間的分析。經過整整兩年不停的辛勞，終於成功推算該區的空氣擴散特性。這份研究總結[1]在 1984 年完成，並提交有關政府部門，以作當時發展將軍澳的參考。

時光荏苒，沒想到現在的將軍澳已發展成為一個成熟的住宅區，道路四通八達。為了當地居民的需要，現在天文台每小時的

1 E. Koo, B.Y. Lee, C.M. Tam, "Final Report of Meteorological Studies of the Junk Bay Air Shed", Occasional Paper No. 61, Royal Observatory, 1984.

天氣報告也包括了將軍澳在內。今天致電天文台舊同事，查詢有關那處氣象站的資料，欣然知道它仍設置在靈實醫院裏，亦即是我們三十年前開發的那一個位置。雖然我已經從天文台的工作崗位退下多年，但原來人的精神仍會繼續的，不枉當年各組員的努力和自己所付出的時間和心血，為這個新市鎮的發展過程出過一點綿力，貢獻社會。

在 1982 年空氣污染氣象研究組的同事們（從左至右：張文瀾、古許慕彬、吳建輝、李照光、譚焯明）

安裝在將軍澳靈實醫院屋頂的香港首個聲波雷達和自動氣象站

用來量度氣温、濕度和風的垂直廓線的紅色飛船，背景是發展前的將軍澳

人生四季

譚焯明博士
Dr. Tam Cheuk-ming

Dr. CM Tam, retired Senior Scientific Officer, associates his career at the Observatory with honey-moon spring, developing summer, harvesting autumn, and his retirement with a leisure winter. In 2008, he went through a series of competitions in Stockholm, Sweden, culminating in winning the prestigious Stockholm Challenge Award for the World Meteorological Organization (WMO)'s World Weather Information Service website hosted by HKO. He received the award on behalf of WMO and HKO at the Blue Hall of Stockholm City Hall with great pleasure and mixed feelings.

車子剛停在香港天文台彌敦道入口前的巴士站，有一種莫名的親切感湧現。這段路，曾伴我走過三十個寒暑，渡過我人生的四季。

寒窗二十多年，畢業後考入天文台，任職科學主任，展開我人生新的一頁。難忘第一天上班的心情，戰戰兢兢，內心有團熾熱的火，好像春天的開始，充滿著幹勁，萌芽學習，迎接未來種種挑戰。記得當時每位新入職的科學主任都要完成一個專業的氣象課程，考獲認可資格後，才可在譽為「木人巷」的天氣預測總部輪班當值，利用電腦、衛星和雷達等先進儀器去預測天氣，熟悉不同季節影響本港的天氣系統，從而發出適當的預報，這段日子，令我深深體會到以科學保障市民安全的重要。回想當日我初出茅廬，慶幸在預測總部遇到一班經驗豐富的同事，得到他們友善的提點，試用期總算順利渡過。

蜜月期過去，進入如火如荼的夏季。開始為事業而打拼，努力開創屬於自己的一片藍天。從調派到將軍澳和大亞灣作先頭部隊，研究該區的空氣擴散潛力，再到儀器部負責設置氣象站及地震台網，經驗一點一滴的累積。當然，在湛藍的盛夏，有成功解決的個案，也偶有遇上失敗的挫折，像突如其來的狂風驟雨。回歸祖國後不久，香港遇上亞洲金融風暴和「沙士」疫症，政府急需大幅降低開支，不但要凍結公務員數目，還要削減各部門的人手，天文台也要加入瘦身行列，多名經驗豐富的同事接受了「肥雞」和「乳鴿」餐，相繼離職，人事的變遷，工作量的繁瑣，疫症的威脅，人就在風雨中茁壯成長。

經過歲月的磨鍊，等待秋天的收成。退休前，我負責天文台互聯網站的運作，當時洞察到流動通訊的迅速發展，於是，結集組中同事及合約僱員的專業知識，以天、地、人為本，積極聚焦

開拓流動平台的資訊，將天文台最新、最重要的天氣信息，隨時、隨地發送到流動用戶手上的智能電話或平板電腦，前所未有地提高了天文台對市民發送天氣資訊服務的水平，更大幅度拉近了彼此的距離，令天氣資訊成為香港市民生活的一部份。現在拿著手機，即可看到天文台所發出的最新信息。昔日播下的種子，今天終於開花結果了。

2008 年，事業生涯將近尾聲，因為負責天文台的互聯網站，同時要為世界氣象組織接收及管理由各國家氣象中心發出的天氣預報信息，經過整理後在互聯網發佈。有需要到各地公幹、旅遊或救災的人士或機構，都能透過這個網站獲得當地官方的天氣資料，以作出發前的準備或籌劃。當時，機緣巧合，就以這個「世界天氣信息服務網」出戰著名的瑞典斯德哥爾摩挑戰賽，經過一場艱辛論壇式的競爭，最後僥倖得到各評審的眷顧，贏取了這項國際通信科技賽事。當我站在斯德哥爾摩市政會堂領獎的一刻，真的是百感交集。

感謝多年來一起共事同僚的協助與包容，伴我走過三十個寒暑。時光飛逝，退休離開了天文台也將近三年了，人生開始步入寒冬。有人會恐懼冬天的嚴寒，但我常說：「只要裝備齊全、心志成熟，何懼之有呢！」，退休後，樂得悠閒似過冬，以前為生活而忙碌，現在多了時間做自己喜歡的事情，與老伴流浪天涯，享受人生。昔日的同事，風雨同路，今日變成波場上的“戰友”，殺個痛快淋漓，閒來酒水相聚，細說往事。過去的喜怒恩仇，都變得風清明月，再重的事情，也只不過是茶杯裡的風波。大家相約走到山澗峻嶺，賞花閱草，笑看風雲，感悟四季人生。

香港皇家天文台在彌敦道的入口（攝於 1980 年）

香港天文台在彌敦道的入口（攝於 2009 年）

與李本瀅博士（右）在天氣預測總部一同工作（攝於 1981 年）

與天文台的舊友新知結伴郊遊（攝於 2012 年，相片由邱雪儀女士提供）

彩霞如赤炷 秋水含落暉

梁榮武
Leung Wing-mo

Mr. WM Leung, former Assistant Director of the Observatory who headed the Radiation Monitoring and Assessment Branch, recollects the challenges he faced in tackling the aftermath arising from the Fukushima accident in Japan. On the other hand, this event fully demonstrated the team spirit and dedication of staff, which gave him and the team an opportunity to earn commendation from the Chief Executive for the exemplary performance. Besides radiation related incidents, Mr. Leung is also concerned about the impact of climate change and shares what he has witnessed in the low-lying Pacific nation of Kiribati, which is running out of time as sea level rises.

彩霞、秋水、落暉，都含有一點點終結將到的意味；而2011年的秋天，正是我在天文台29年旅程的終結。歡送會上，各方好友、新舊同事都送上真摯的祝福，見到的都是燦爛的笑容(圖一)。我，雖然笑面迎人，但心中實難免頓感落莫。回望過去，百般滋味在心頭，總的來說，得着的遠多於遺憾；而在天文台最後的幾個年頭，慶幸有機會發出了夕陽的餘暉。

話說2009年4月台長林超英退休，同月，我獲晉升為助理台長，主要處理環境輻射監測的工作，職位簡稱AD(R)。這時，距離退休之日已不足3年。一位已退休的前上司半說笑地說，退休前擔任AD(R)，是過渡到退休生活的最好安排，言下之意是AD(R)一職較為輕鬆。平心而論，比起其他三位助理台長，這是事實；AD(F)每天要和老天爺角力，預測天氣。即使今天的大氣科學和預測技術比起我當預報員的年代已大大改進，但對不少天氣過程的掌握仍然沒有十足把握；遇到重要天氣時，壓力依然很大；至於AD(A)，除了一樣要應付天氣的挑戰外，亦要處理棘手的機場多普勒雷達；另一位是AD(D)，她是大內總管，天文台內大事小事都要勞心勞力。而我，AD(R)的工作量雖然不算少，但絕不是十萬火急的事，工作上的緩急輕重，容易安排，壓力自然不太大。但是，世事無絕對，2011年發生了翻天覆地的事件。

2011年3月12日星期六早上，我如常跑步到辦公室工作。在星期六、日開工，沒有平日的開會、電話和其他滋擾，是一種享受，這亦是我十多年來的習慣。家在荔枝角，跑到尖沙咀一般要45分鐘。起跑大約20分鐘後，已到達旺角櫻桃街公園。這時，手提電話響起來，來電的是一個陌生的電話號碼，心中不禁納罕，有誰在星期六大清早找我？當然，我很快便知道答案。原來，保安局要求天文台派員到政府總部開會，商討有關日本福島核意外

的應對策略。事關重大，我立刻向台長李本瀅匯報，並建議由我親自到保安局開會。同時，腦海中出現一連串問題。日本當局在3 月11 日的報道中，不是說大地震發生後，福島核電廠已成功完成「冷停堆」嗎？既然反應堆核燃料的溫度已受控制，為何會出現核泄漏？福島核電廠採用什麼類型的反應堆？... 為了爭取時間，棄跑步轉乘的士，順便在車廂內思考當天的應急工作。

氣象人對時間和空間的感覺比較敏鋭，深知3,000 多公里以外的核事故最少要4 至5 天後才可能影響香港，而且途中的大氣擴散和稀釋亦會大大降低香港的風險。故此，當時立刻意識到首要的工作是如何透過科學的分析、推論和數據，向大眾解釋香港的處境，減低不必要的疑慮。在3 月12 日的會議中，保安局的主要官員亦同意這個大方向，而天文台在未來一段頗長的日子裡便是要貫徹執行這方面的工作。

核意外的事態發展急轉直下，氫氣爆炸、廠房大火、堆蕊融化、輻射外泄、美國撤僑等消息接踵而來；而香港人的關注、不安以至惶恐心情亦與日俱增。

面對核意外的第一個條件反射是分析核意外地點的氣象實況，和大範圍天氣系統的短、中期變化。值得慶幸的是：在三月，日本一帶經常受西風帶所影響，任何輻射排放在大部份時間都會被西風吹到太平洋上空，不會直接影響香港。我們立刻利用不同渠道，包括記者招待會、Youtube、天文台網頁，以至公開講座，把這個重要訊息發放，安定人心。而氣候預報組的同事更把剛剛開發不久的氣團軌跡預報圖（圖二）投入服務，在天文台網頁內展示未來三天到達香港的氣流的源頭，清楚顯示氣團並非來自日本，利用科學說明事實，消除憂慮。

當然，氣象的考慮只是分析和判斷的第一步，更重要的仍是本地輻射實測數據。這包括自動站的實時環境伽馮電離輻射水平，和環境樣本中人工放射性物質濃度的化驗結果。同事們不單增加了收集樣本的數量和化驗的速度，更要編寫新網頁，把有關數字在第一時間公佈。他們日以繼夜地工作，部份同事更加連續多個星期在星期六、日進行化驗和分析，馬不停蹄，目的只有一個，就是讓科學數據説明事情的真相。

天文台原先為數十公里以外的大亞灣及嶺澳核電站而設計的應急計劃和設備，沒有想到在 3,000 公里以外的核意外竟可大派用場。由上世紀 80 年代開始籌備的工作，經過幾代前輩的努力，這計劃實際上是相當完善和全面的。正因如此，我們處理這個世紀大災難的時候，才可以臨危不亂，在充份掌握形勢之下有條不紊地部署工作。

事後總結，福島事件讓我們重新檢視核意外應急計劃，這些實戰經驗十分難能可貴。值得慶幸的是，絕大部份公眾對天文台在事件中的表現的評價是非常正面的。而我和兩位高級科學主任更被台長推薦，獲頒授 2012 年行政長官公共服務獎 (圖三)，我更加是自 2009 年之後第二次獲得同類嘉許，除了令我倍感謙卑之外，更加要感謝和我一同努力付出的同事；畢竟，這份殊榮，其實是屬於全體 "R " 科以及其他支援我們工作的同事，我們三人只不過是代表他們領獎而已。

處理核意外時有一小插曲，由於我參與了香港電台氣候變化紀錄片系列《沉沒的國度》的製作，而外景拍攝和訪問月前已安排在 3 月尾，即日本福島核事故發生不久後進行，不可延期。當時唯有臨危受命，由同事們分擔了沉重的核應急工作。而在南太平洋島國吉里巴斯拍攝期間，免不了時不時關心香港的應急工作。由於當地的通訊設備十分落後，和同事們用電郵聯系，了解核事故的發展，往往要花上大量時間。但事實証明我的關心和擔

心都是多餘的，香港的同事的應急能力十分了得，運籌決策，一切都在他們的掌握之內。這証明一個成功的機構在緊急中的運作和表現，往往決定於它的制度、事前準備和團隊的質素，個人的影響十分有限。

在吉里巴斯拍攝和走訪當地的官員和人民，有機會親身感受到這小小島國受氣候變化和海平面上升所帶來的威脅。而同在太平洋的日本，則受福島核意外的沉重打擊。表面看來，兩國的遭遇似乎風馬牛不相及。但是，究其根源，其實兩者都反映了使用能源可能要付出的另類的痛苦代價。福島居民需要遷離核污染區的同時，吉里巴斯亦開始設法讓國民移居外國，逃避被海水淹沒(圖四)的命運。吉里巴斯總統更因預見他的國民將成為氣候難民而慨嘆地說："It would be a sad day when there will be no longer a country, a nation, a people called Kiribati"。的確，面對國家民族的消失，而無計可施，那份無助和無奈的感覺是難於言表的。而諷刺的是，最先承受氣候變化的惡果的正是排放温室氣體最少的人民。

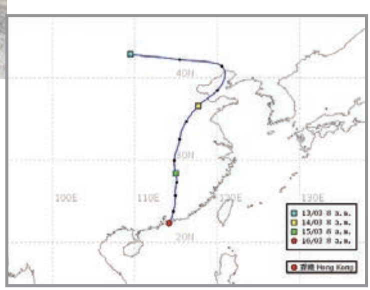
《沉沒的國度》已在 2012 年在香港的免費頻道播出，播出之前真有點擔心，不知效果好不好。但播出之後，竟收到海內外的親友、同事，甚至中學老師的讚賞，的確是意外的收獲。這紀錄片的製作，尤其是外境拍攝，其實很多時是苦不堪言的。不能不提的是製作隊的工作人員，包括導演 Alan，監製 Clay，以至潛水專家 Bibian 和 Simon 都非常專業，而 Alan 在後期製作中所付出的心思和努力，更被受一些行內人擊節稱賞。

《沉沒的國度》雖已告一段落(大家當然可在 Youtube 重温)，但我們面對的問題的嚴重性已越來越顯而易見。2012 年初歐洲的大風雪做成大混亂，及後在美國的熱浪、山火、旱災，已令大豆及玉米價格暴升。「美國國家氣候資料中心」(NCDC) 在 2012 年 7 月發表報告，指出美國連續 12 個月的偏高氣温隨機出現的

機率少於十萬份之一，即是說，如果沒有全球暖化，這些極端天氣是難以發生的。

人類是萬物之靈，我相信我們有智慧在面對由「消費主義」為核心的經濟發展模式而令氣候變化危機不斷加劇的時候，認真反思，和果斷地作出正確的選擇。

圖一　2011 年 11 月歡送會後與台長岑智明 (前排左五) 及一眾女同事合照。秋日和煦的陽光照在我們的面上，只見燦爛的笑面，沒有一絲離愁。願我開朗的笑容，會留在同事們的心坎裡。



圖二　於 2011 年 3 月 16 日在天文台網站發佈的新網頁 - 抵達香港之氣團的預測路線圖

圖三　行政長官公共服務獎狀頒授典禮後筆者 (右一) 與同事合照

圖四　吉里巴斯正面對海平面上升的威脅。圖中這地方原本是一條住有百多人的村莊，因曾被大潮水淹浸，土地和地下水受到鹽化，居民不能再在這裡生活耕作，已全部撤離。

本台今昔 Observatory Now and Then

解答查詢的意外收獲

趙孔儒
Chiu Hung-yu

Mr. Chiu Hung-yu is our Senior Experimental Officer responsible for training and education. The Observatory provides meteorological services based on science and often receives public enquiries on various topics related to atmospheric science and phenomena. In analyzing and answering these questions in the past few years, he has derived much satisfaction in not only being able to help others but also enriching his own knowledge. In this article, he describes his experience and feeling in handling these enquiries. A few citizens' enquiries on observing fantastic atmospheric optical phenomena had drawn his particular attention. The author's explanation together with the wonderful images of these phenomena contributed by these citizens, constituted useful materials for popular science education, promoted by the Observatory.

香港天文台是一個以科學為基礎服務市民的部門，除了提供日常的氣象服務外，亦著重推廣科學知識。

在過去幾年，由於職位轉換了，常常接收到經總務部分發或輾轉送過來的市民查詢，有些更是源自政府的1823 電話中心發送過來的。市民的查詢是必須在規定的限期內作答，很多問題是意想不到的，然而卻是甚具啟發性，激發以不同的觀點理念去思考這些問題，並需要細心辨別理解清楚才能合理作答，之後也感覺有所得著。

一些問題看似簡短，其實複雜以至艱深！人們找不到答案的問題最具有挑戰性和吸引力。除了因為要解答市民外，好奇心和好勝心也驅使著我要滿足自己在這方面的興趣和知識渴望。我收到的查詢包括有關天氣現象和太空天氣等問題。在這裡介紹關於解答一些大氣光學現象的趣事。

有幾位市民巧遇了一些異常奇特有趣的天氣現象，並拍攝了照片（例如圖１），由於罕見又不知道是甚麼現象，於是就以電郵方式向天文台查詢。

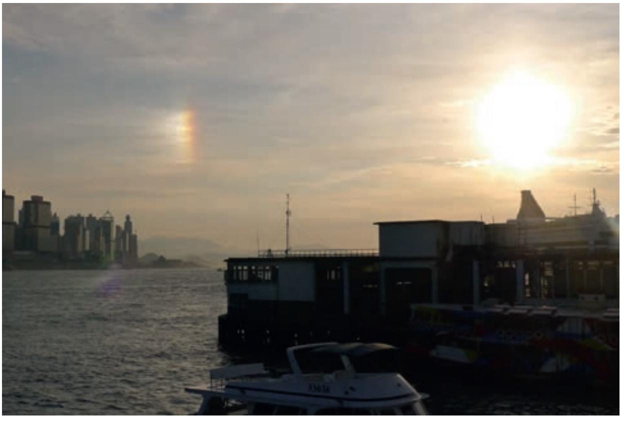


圖１ ：在維多利亞港上空看見太陽左邊的一個「幻日」（圖片由 Mr. Alfred Lee 拍攝和提供）

我看到這些照片影像後，覺得很精彩和很珍貴難得，那是一些十分有趣味性的大氣光學現象，包括「幻日」和「彩光環」（圖2）。這些現象異於日常所見的雨後彩虹，要在特殊的天氣條件下，才會偶然出現，眼前一亮，在片刻之後消失無蹤。

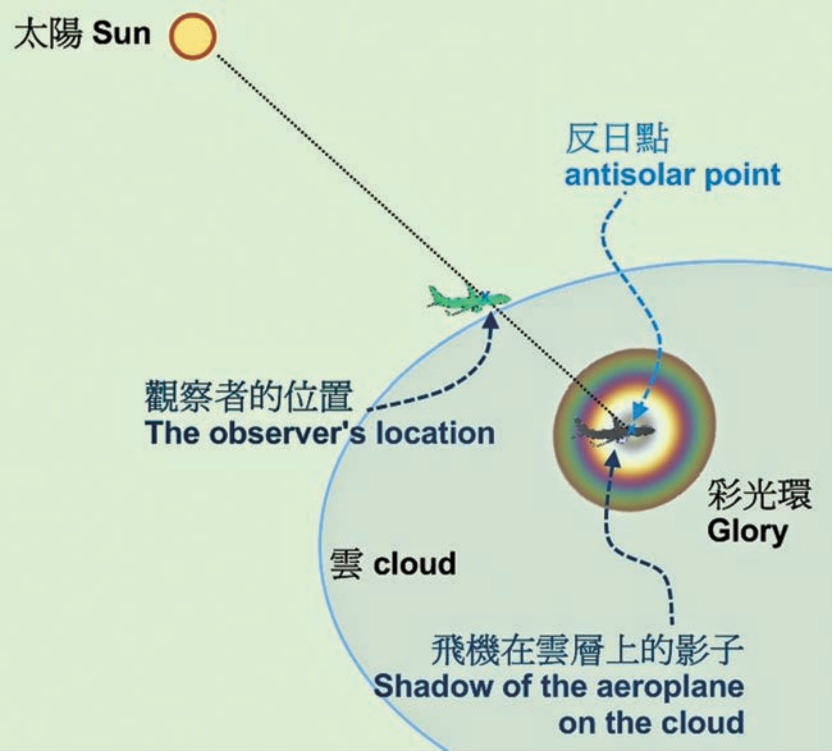


圖2 ：筆者在天文台網上「教育資源」編製的彩光環示意圖（彩光環原圖本文略）

一些問題或天氣現象不是三言兩語便可以解釋清楚。上述的大氣光學現象，由於那幾位市民有敏銳的科學觸覺、分享精神和推廣普及科學的共同意願，引發我撰寫文章，過程中我也發現，在盡心解答市民的查詢後，市民也樂於提供那些照片影像給天文台採用，讓廣大市民和同學們了解和欣賞那些奇妙的大自然現象，促進推廣普及科學，也間接清除了人們長久以來對這些現象的迷惑、誤解以至迷信！不管怎樣，至少也填補了解釋有關現象的空白部份。

註：　有關的文章在天文台設在互聯網上的「教育資源」網站以下的連結可以找到：
http://www.weather.gov.hk/education/edu06nature/ele_glory1106_uc.htm
http://www.weather.gov.hk/education/edu06nature/ele_sundog0909_c.htm
http://www.weather.gov.hk/education/edu06nature/ele_sundog1109_uc.htm

風球再起的日子

黎守德
Lai Sau-tak, Edwin

After 13 years, a period spanning two No. 10 tropical cyclone signals, Mr. Edwin Lai, Assistant Director of the Observatory, picks up the loose end and produces the eagerly awaited “Days of the Return of Typhoon Signals”, a satirical piece of work and a sequel to “Days with No More Typhoon Signals” written in 1999. Given his long-standing interest in weather forecasting, as well as his psychic (or some would say “psycho”) eyes and sceptic (or some would say “septic”) views for the future, he makes some preposterous very-long-term forecasts about the challenges in the development works of the Observatory, set against a futuristic society facing heavy pollution, rising sea level, political strife, media scrutiny and civic unrest.

若干年後某年 - 尖沙嘴海傍發現出土文物，經考究後證實為當年香港天文台的舊警告信號系統，包括熱帶氣旋信號的一、三、八、九和十號風球。對於採用這些數字背後的因由，在坊間與網域也引起不少議論，普遍認為是和香港人固有迷戀幸運數字的癖好有關。適逢香港娛樂博彩業界的盈利經多年努力後終於首次超越澳門，成為華南地區的第一賭城，在利好的氛圍下，本著先「賭」為快的信念，一般認為恢復風球系統可以提供新的博彩商機，有利香港長遠的經濟發展。

若干年後某年 + 10 年 - 經過一連串和無數次的公眾諮詢後，各方代表皆以影響風水為理由反對在其區內豎立桅杆懸掛風球。最後天文台成功研製出一套遙控的風球懸掛系統，裝置在人煙罕至的橫瀾島上，並安排在網上和電視天氣頻道直播風球懸掛過程。系統啟用，剛好趕及風季最後一個闖入香港警戒範圍的颱風，闊別多年的一號戒備信號徐徐升起。但由於當時空氣污染造成大範圍的煙霞籠罩廣東沿岸地區，能見度欠佳影響了轉播的效果，天文台台長公開致歉。

若干年後某年 + 11 年 - 闊別多年的三號強風信號徐徐升起。天文台表示強風指標是基於最新發展的極高分辨率衛星遙測數據，可以實時反映境內各點的風力和海浪狀況，讓市民可以更準確地掌握其身處地方的風勢和海浪變化。雖然資訊既快且準，但由於各區的風浪分佈十分不均勻，導致來往各島和海底城區的海路交通大受影響，市民出入往返無所適從，怨聲載道，天文台台長公開致歉。

若干年後某年 + 13 年 - 闊別多年的八號烈風或暴風信號徐徐升起。老天爺似乎是要讓廣大市民留下深刻印象，影響香港的熱帶風暴在珠江口上空徘徊打轉兩圈，東北、東南、西南與西北四個方向的八號風球均先後發出兩次，八號風球生效時間打破以

往紀錄，維持達兩天之久。雖然天文台的超準電腦天氣預報模式在處理如此奇特的風暴移動路徑仍能發揮卓越的成效，但由於風球轉換時間成為馬會新興的博彩項目，在官商勾結的疑雲下，有立法會議員質疑，認為有幕後集團操控之嫌。天文台為求清白和以示公允，承諾以後風球發出時間會事前進行網上公開諮詢，並由專業核數師在天文台預報中心監察整個業務運作過程。對於今次事件所觸發的廣泛公眾疑慮，天文台台長公開致歉。

若干年後某年 + 16 年 － 闊別多年的九號烈風或暴風增強信號徐徐升起。由於颱風臨門腳軟減弱，萬眾期待的十號風球最終沒有出現。天文台解釋風力增強的評估是基於最新發展的概率預報系統所提供的計算結果，如果本港出現颶風程度風力的可能性達到七成或以上，便會懸掛九號風球，作為十號風球的預警。記者追問七成機會應該如何理解，天文台的回應是如果同樣情況出現十次的話會有七次應驗。但由於同樣情況實際上不可能重複發生十次，所以基本上準確度難以判斷。慣於以偏概全報道消息的大眾傳媒，卻把天文台的回應演繹為十次九號風球中，會有七次隨後懸掛十號風球。無論如何，為了十次中的第一次虛報導致公眾廣泛失望，天文台台長公開致歉。

若干年後某年 + 20 年 － 闊別多年的十號颶風信號徐徐升起。一群「追風」發燒友無懼風浪，開船到橫瀾島見證這歷史時刻。如此瘋狂行徑，天文台一度透過其新開發的網上個人天氣警報頻道發出特別通告直斥其非，敦促市民不要胡亂仿傚，理當慎重執行風暴信息中所建議的防禦措施，以確保性命財產的安全。事後「追風一族」作出反擊，指責天文台干預思想自由，推行「洗腦式」的公眾防風教育。事件愈鬧愈大，天文台終於被迫撤回風暴信息中所有防風勸諭。另一方面，經過連續三次沒有十號風球的九號風球後，行將卸任的天文台台長對終於可以成功發出十號

風球表示欣慰，感到如釋重負，在記者會上發言時更感觸落淚。對自己當眾失儀的舉措，天文台台長作出其任內最後一次的公開致歉。

［筆者後記一：以上故事人物與情節，純屬虛構，如有雷同，實屬非常巧合。而文章內所有似是而非的言論，不一定反映現實，更不代表香港天文台的立場。］

［筆者後記二：《風球再起的日子》之前傳是《沒有風球的日子》，寫於1999年，後改編成前天文台台長林鴻鋆博士的《香港家書》(www.hko.gov.hk/dhkovoice/letter120699.htm)，在香港電台播放。文章中提及的「H18N168」世紀病毒，戲言的預測，卻不幸而言中，數年後竟然在2003年「沙士」一疫應驗。］

前台長林鴻鋆博士於2001年主持最後一個「掛風球」的訊號站長洲信號站關閉儀式，按掣將十號風球降下

［筆者後記三：虛幻荒誕的預測，也希望是錯的，以免弄假成真。科學的領域，著重開放的態度，不斷研究和探索，糾正或完善固有的想法，求真求新，透過科技的應用提昇服務，造福社會。天文台經過130年的歷史，一直伴隨著香港成長。展望將來，期盼我們看見的遠景是一個真正擁抱開創動力的社會和環境，讓科技演進所帶來的好處可以有充足的發揮空間。］

天氣預報生涯的點滴

鄭楚明博士
Dr. Cheng Cho-ming

Dr. CM Cheng, Assistant Director of the Observatory, shares the memorable moments during his induction training in the UK, including his good mentor, as well as the challenges he faced in the forecasting office.

不經不覺，在天文台工作已經二十多個年頭。我跟眾多同事一樣，在天文台工作的初期，必要經歷天氣預報的工作。預報中心可以說是我們的“木人行”。以往我曾進出預報中心兩次，對預報工作甚感興趣，及後被輾轉派往其他不同的崗位，近年回歸天氣預報的工作，負責管理公眾天氣服務。

我在大學時是念物理的，對氣象沒有認識。剛進天文台不久便被派往英國受訓約五個月，正式學習氣象這門課。所學的主要是氣象的基本知識，包括氣象觀測、氣象儀器的運作原理、天氣系統的理論、天氣預報的方法等，這些知識放諸四海皆合用。在英國上課，課程論及的天氣系統和其預報方法重點當然放在緯度較高的地區（如歐洲）的天氣系統。高緯度地區主要受冷鋒及暖鋒影響，天氣變化一般很有規律，預測起來較有把握。在完成理論課後，我被安排到英國的地區氣象局實習三個星期，之前所學習的預報方法正好付諸實踐。

記得我是在英國中部曼徹斯特市以南一個名叫 Stockport 的小鎮的氣象局實習，當時的一些經歷很值得回味。我在實習期間是跟一名有經驗的預報員邊學邊做的。年代久遠，我已經忘記了他的名字。這位預報員很有趣，不時在工作期間說笑，閒來亦不時吃水果，真的吃得很多，感覺他的工作蠻寫意呢！我跟這位預報員一起輪班，在不同的預報崗位工作，從他身上學到了不少實用的預報技巧。在工作時，我要在限定的時間前完成指定的天氣預報，給這位“師傅”過目，然後才發出預報。經他不斷的訓練，在實習的後期，他基本都不看（可能他在我背後看了很久）便著我發出預報，我心情當然是戰戰兢兢，生怕預報有誤。令我更膽顫心驚的是要現場做電台天氣節目，與電台的節目主持人交談，闡釋天氣預測的詳細內容。雖然在上理論課時曾經在這方面受簡

單訓練，但實際做現場節目時仍十分緊張，幸好三星期的實習期間只需要做兩次節目，否則恐怕心臟病發！

令我十分難忘的是在實習期間，碰到人生中第一次下雪的情景。記得下雪時在接近黎明時發生，當時我正當夜班，相信當晚全氣象局最雀躍的只有我一人。是次下雪來得有些突然，氣象局其他同事均忙於更新預測，而"師傅"則很通情達理，著我到戶外片刻去拍照，亦讓我第一次感受下雪的滋味。當時時間尚早，四下無人，天泛微光，雪花飄飄，滿地鋪上一層新雪，感覺十分寧靜。當我在兩三小時後下班時，情況卻十分不同。那時Stockport 不單下雪，而且受到強對流天氣影響，下起一陣冰雹來。這些冰雹非常細小，直徑只有半厘米，顏色潔白，但十分堅硬，我們叫做"龍吐珠"，落到頭上打得有些痛呢！從我下班的氣象局走到下榻的旅館需時二十分鐘上下，路上的一些新雪已經被行人踏至堅硬，還很溜滑，由於我穿的只是普通的鞋，一個不留神摔了一跤，幸好當年年紀輕，沒甚麼大事，總算遇過難忘的經歷。

另一件令我十分難忘的事，就是在當地認識了從香港移民到Stockport 的李先生一家。李先生是我經同事介紹，冒昧到他在當地開的外賣店認識的。李先生及李太十分好客，每當我不用在氣象局上班實習時，多會到他的小店，享用他的中國菜。在外地待了長時間，有機會嚐嚐家鄉菜，感到十分溫暖。自從回港後，我們亦保持每年互通聖誕卡。今年李先生更與兒孫到港旅遊，有機會與他再共聚，感到極愉快。現時與他的兒子在 Facebook 成為了朋友，有更多機會知道他一家的情況，與他家的聯繫更密切了。

當年受訓完成後回港不久，便到預報中心工作，發覺香港的天氣與英國的很不一樣。如前所述，英國主要是受冷暖鋒影響，天氣變化較有規律。而香港位於亞熱帶較低緯度的地方，影響香

港的天氣系統較複雜，因此要努力學習預報香港地區天氣的技巧。天文台很多前人在預報香港的天氣下了很多功夫，歸納了不少的預報守則，我們當年便是主要按這些守則來作天氣預測。記得當年我們只預報未來三天的天氣，由於當時科技所限，作三天預報已經很不容易。

香港夏天多出現雷暴大雨，雨勢變化大，伴隨雷擊，對市民生活影響很大。對於預報員來講，及時發出天氣警告便是首要的任務，以減少惡劣天氣帶來的災害與損失。這是眾多預報員必然經歷而責任重大的工作，但在以往的同事中，卻有一位姓羅的同事很少碰到惡劣天氣而要發出天氣警告，相信不少同事仍記得她的特殊經歷。我曾與她共事一段短時間，當年我在預報中心實習期間，有一晚是跟她一起當班，那晚她是我的“師傅”。當晚廣東內陸地區出現了一道東西走向而廣闊的雷暴帶，向南逼近香港。心想這回香港會與雷暴帶碰個正著，發出雷暴警告可少不了。眼見師傅不慌不忙，神態自若，似全未受雷暴帶的絲毫影響。說也奇怪，這道雷暴帶移近香港時一分為二，分別在香港以東和以西經過，而香港沒有絲毫雷暴，雨亦不多，當然不需要發出任何雷暴警告呢！這次真的見證了她的特殊經歷，不由我不信！

除了雷雨外，香港夏天亦會受熱帶氣旋（一般多叫颱風）光顧，每位天氣預報員皆曾接受颱風的洗禮。颱風一來，預報員便要抖擻精神，好好面對大量的工作，盡力做好預報的任務。工作壓力當然少不了，但預報員亦獲得了日後娓娓道來的珍貴經歷。對於預報員來講，最珍貴的經歷可算是在十號風球期間工作。當室外狂風怒吼、大雨橫掃甚或雜物亂飛時，在預報中心內的各同事們則要全神貫注的監測颱風的動向和香港的天氣變化，這些經歷真不為外人道。香港十號風球的機會不多，在今年 7 月的強颱

風韋森特以前，便要數到1999年9月颱風約克時的十號風球，相隔接近13年。我在天文台工作超過20年，竟從未在工作中遇到十號風球！今年7月韋森特的十號風球期間，我剛巧到了外地開會，與十號風球緣慳一面。我餘下的工作生涯不到13年，未知仍否有機會在十號風球下工作呢？

相比以前，隨著科技的發展，特別是數值天氣預報模式技術的提高，使我們可以提供更長的預測，現時香港天文台已提供未來七天的天氣預測。不過，要提供更長的天氣預測實非易事。雖然數值天氣預報模式已經可以提供更長的預報，但較長的天氣預測的表現實際仍不太理想。眾所周知，時間越長遠，天氣預測的誤差便越大。按所謂的混沌理論（chaos theory），初始時的一些小的誤差，有時可以很迅速的增大，做成很大的預報誤差，亦做成預報的不確定性。很多人都聽過"蝴蝶效應"，謂一隻蝴蝶在巴西扇動翅膀，會在德克薩斯引起龍捲風。這是混沌理論先驅E.N. Lorenz 的名言，正好形容預測的困難所在。用簡單的例子來說，在一條小溪上，我們放上一條紙船，讓它順流而下。一般如果溪水流動較順時，我們不難預測未來紙船的大概位置。但是如果小溪中佈滿了大小不一的石頭時，溪水流動變得波動。紙船可能在某一石頭的左邊漂過，亦可能在其右邊漂過，而紙船在石頭的左邊或右邊漂過會直接影響它往後的漂流路徑，這使準確預測紙船往後的位置變得困難。當然，氣象界並不甘心這一情況，仍希望科技的發展可以讓我們克服困難，更進一步掌握更長遠的天氣預報。今年諾貝爾物理學獎是頒給兩位量子光學專家，他們突破性的用實驗證明可以量度微觀世界粒子的特性。以往量子物理的概念是：微觀世界粒子的特性是無法直接量度的，因為在量度的過程中會破壞了粒子的特性。而上述兩位科學家卻打破了這一宿命，開創了新的紀元，使量度微觀世界粒子的特性變成可行，亦

使建造"量子電腦"（比現在的電腦可以更細更快）變為有可能。真的希望氣象界亦可以打破混沌理論的宿命，讓我們可以提供更長遠的及更準確的天氣預測。也許有一天，我們可以利用量子電腦來作數值天氣預報，使天氣預報更快更精細。

人生第一次碰到的雪景。1990 年 1 月在英國曼徹斯特附近的 Stockport 拍攝的，當時正下夜班回旅館途中。

在回旅館途中，不單踏雪而行，而且看見遠處有雷暴相關的雲團正逼近，不久便下起冰雹來。

愛、家庭與工作共融

吳陳金珠
Ng Chan Kam-chu, Mirinna

Ms. Mirinna KC Chan is the Observatory's senior draughtsman, working with great enthusiasm while striking a balance between work and family. She received the Secretary for the Civil Service's Commendation in 2007 for her outstanding performance and active participation in volunteering and outreaching work. She recalls many fond memories, unforgettable moments and interesting events in the past 30 years of work and life in the Observatory's family.

「人生有幾多個十年？」時光飛逝，轉眼間我在政府已工作了三個「十年」，而當中有二十三個年頭更是在天文台渡過。在這漫長歲月，我經歷了五位台長的領導，更令我培養出對天文台深厚的感情，每天上班就如回到另外一個家。這裡同事間相處和睦融洽，凡事有商有量，互相尊重，彼此關懷和配合。而且天文台四周環境優美，鳥語花香，空氣清新，簡直是城市中的森林，令人感覺舒暢。因此，不少人眼中平淡乏味的公務員生涯，在我心目中卻是多采多姿。

天文台的主要工作是預測天氣，天氣情況可以變化很大。而我在天文台的工作在過去二十年間也產生了很大轉變。我和繪圖室的同事一直努力把握時機，憑著一股幹勁，不斷自我增值，與時並進，學習美工專業電腦技術，踏上由日常繪圖至製作大型展板之路。把純粹繪畫天氣圖的隊伍轉型為天文台的美術部。在工作過程中，我會和同事們保持良好溝通與互動，以確保服務稱心，同事滿意。

近年來，天文台在各區設置自動氣象站。美術部須要在各個氣象站啟用時為開幕會場設計展板。因此，我便有機會和其他部組同事前往很多不同地方工作，加深了我對天文台戶外設施的認識。其中往滘西洲外站設置太陽輻射站的啟用典禮是我印象最深刻的一次。雖然地點有點偏遠，需要長途跋涉才到達，但到達後我被那裡一大片綠油油的草地深深吸引著，風景實在太美麗了！不過我也沒有忘記自己的任務，就是要在山勢頗高的哥爾夫球場設置展板。當時正值七月，太陽伯伯非常耀眼，熱氣逼人，站在那兒工作真是「乾」曬，完全沒有遮蔭。雖然我已經穿了長袖衫和戴著帽子，但是皮膚還感覺很刺痛，經過一個多小時工作後，不但汗流浹背，全身濕透，突然還感覺有些頭暈目眩。我立即走入擺放物品的帳篷休息和喝水，待身體降温後才感到舒服些。真

糟糕，原來我差點兒中暑啊！自此之後，我更加佩服經常要在戶外工作的同事，實在是超級辛苦！

二零零八年滘西洲外站設置太陽輻射站啟用典禮

　　在天文台工作雖然忙碌，但當中也有一些令我印象特別深刻和有趣的事情。記得有一次在天文台開放日，我扮演天氣家族的「雷電仔仔霹靂頭」，和市民合照留念。這是我第一次穿著「公仔服飾」，初次親身感受到道具公仔頭的重量，並不簡單。當與台長拍攝合照時，我實在不夠氣力拿著它，幸好當時站在我身旁的台長林鴻鋆博士毫不猶豫地借出他的肩膊來承托著它。現在回想起來，仍然覺得十分有趣。

二零零二年天文台開放日作者與同事們扮演天氣家族成員，穿上「公仔服飾」

另外，我亦代表天文台參加了兩次太陽能車大賽，還擔當車手。憑著工場、雷達機械組和美術部同事的努力，把最初只是一個空空的車架，搖身變成一輛有型有款的可再生能源車—「太陽風二號」。憑著科技與藝術的融合，我們最後勇奪公開組最佳車輛裝飾金獎，更體現了天文台同事合作無間的精神。而我既可以享受駕駛的歡樂，亦有機會與同事一同上台領獎，分享得獎的喜悅！

二零零七年天文台以「太陽風二號」參加於科學園舉行的「可再生能源車競技大賽」

雖然我很喜歡工作，但作為一個女性，我還有另一個重要身份——別人的妻子和母親。要成為一個稱職的雙職女性，是一件絕不容易的事。在家庭中主力打理家務，照顧家人起居外，還要兼顧工作。記得在女兒剛出世的時候，上班和下班的時間是最繁忙的。早上忙完餵奶，又要趕著將女兒送往奶奶家中。晚上放工買餸後便要接女兒回家，隨即趕著做飯，希望丈夫回來後可以吃到一頓充滿愛心的「住家飯」。日以繼夜、夜以繼日地工作，雖然十分辛苦，但望著女兒一天一天健康成長，那種喜悅讓我將所有辛勞都忘掉了。

記得早期在天文台工作時，我的崗位須要在星期日及公眾假期輪流上班；每個月我只有四天假期，所以我非常珍惜和家人相處的時間，亦經常參加天文台職員會所舉辦的親子旅行和宿營等活動。後來政府實行五天工作制，這個安排是我期盼已久，對我們這群雙職女性來説真的是天大喜訊！回想起在二零零六年時，當時的行政長官曾蔭權先生到訪天文台，並與天文台的職員代表會面。曾先生親切地請我們隨便發問，當時全場肅靜，鴉雀無聲，而我真的很想感謝他落實五天工作制，內心驅使我要表達這份心意，手便自然舉起了。我看到台長、助理台長和所有人都十分關注地望著我。本應淡定的我，在全場目光注視下，剎那間感到非常害怕。但既然已舉了手，我只好硬著頭皮，戰戰兢兢地説：「我結了婚，有三個家庭要照顧。如果實行五天工作，可以給我更多時間關心身邊的人，我很多謝特首有這個決策。」幸好我的發言沒有造成任何尷尬場面，事後還得到台長稱讚，我才放下心頭大石。

二零零六年特首曾蔭權訪問天文台與天文台代表對話

隨著女兒漸漸長大，我在家庭的崗位亦變得輕鬆了，多了時間可以做自己喜歡的事，例如義務工作。我在二零零二年加入了天文台義工隊，而我的女兒也是其中一名成員，我和她一起參加賣旗，擺放攤位義賣籌款，親手製作月餅送往老人院等活動，藉此讓她明白助人為快樂之本，幫助別人時自己同樣感到喜悅。兩年前，我和義工隊成員在天文台舉辦了一次慈善賣物會，同事們都很熱心幫忙及捐助，為義工隊籌得不少經費。在每次探訪中，看見「老友記」和小朋友都玩得非常投入和開心，亦令我深深體會到施比受更有福的道理。

身為一位雙職女性，除了家庭和工作外，身體健康也是很重要的。所以我還參加了天文台舉辦的太極班和跳舞班，既可調劑生活，又可保持健康。我很感謝天文台職員會願意花時間和心思為同事籌備這些工餘活動。

我的信念就是做任何事，無論在家庭或工作的崗位，一定要全情投入，積極主動，對自己有所要求，對職責有所承擔，才可開開心心上班去，輕輕鬆鬆回家來。我對自己的家庭和天文台這個大家庭，同樣重視和關心，不分彼此，融滙一體，希望能夠快樂地渡過每一天。

一九九八年筆者與女兒（前排左三、四）參加天文台聖誕聯歡會

一個都不能少！

李淑明
Lee Shuk-ming, Olivia

The Observatory issued the No.10 hurricane signal in the early hours of 24 July 2012 for Severe Typhoon Vicente, the first No.10 signal for 13 years since Typhoon York in September 1999.

As is well known, the Observatory staff work round the clock all the year through to fulfil their duties, be it No. 10 signal or black rainstorm.

And as I recently talked to several colleagues on duty that night during the No.10 signal for Vicente, their fondly re-told stories reminded me of the name of a movie – “Not One Less”. Yes, we always would like to dig out the last piece of observation information available. To achieve that, the operational staff working tirelessly behind the scene were certainly all indispensable!

天文台在2012年7月24日凌晨強颱風韋森特襲港期間發出十號颶風信號，是繼1999年9月颱風約克襲港後，13年來首個「十號風球」。

眾所周知，天文台是「年中無休」的，哪管是「十號風球」還是「黑雨」，天文台當值員工一定堅守崗位。

最近我跟幾位在韋森特「十號風球」時當值的同事傾談，講到那一夜的工作情況，他們娓娓道來時，在我腦海裡浮現了一齣電影的名字——「一個都不能少」。是的，觀測資料固然不能少，而背後的工作人員更是一個也不能少！

十號波，要放波！

天文台在1921年已開始利用氣球作高空探測，同事稱這項工作為「放波」。以往「放波」是人手操作的，自2004年天文台引入全自動高空探測系統後，「放波」便進入全自動化年代。

每天上午八時及晚上八時，京士柏氣象站的自動高空探測系統會將氣球充氣及釋放，懸吊在氣球下面的無線電探空儀，內有氣壓、溫度、濕度、GPS定位等感應器，在氣球上升過程中會探測高空氣象資料，而地面的工作人員則利用電腦接收及整理所得數據，經核實後即時發放至世界各地氣象中心。

高空探測於三號風球時開始加密，在下午二時也「放波」，同時亦會有高級科學助理或科學助理同事在京士柏當值，我們稱之為「當風更」。到八號或以上熱帶氣旋警告訊號生效時，高空探測更進一步加密，凌晨二時也會「放波」，同時更有雷達機械師加入在京士柏「當風更」。

以下是十號風球當晚在京士柏「當風更」的雷達機械師楊雨善及科學助理葉彩雄憶述他們在韋森特「十號波放波」的刺激情況。

楊：「23 號韋森特逼近，晚上八點那個波我已察覺自動高空探測系統有點不對勁，擔心終於可能要人手放波，叫彩雄要有心理準備。」

葉：「整夜我也跟天氣預測總部的屈 Sir（總督導屈錦城先生）緊密溝通，屈 Sir 再三叮囑，首要注意安全，在情況許可下才嘗試人手放波。午夜後十號風球高掛，到凌晨兩點放波時，我們發覺自動高空探測系統真的不行，風實在太大了，氣球發射器的保護蓋根本無法打開！」

楊：「對，當時真的風很大，又下著雨，我即時跑到外面檢查系統，發現機械故障並不能一時修復。颱風風眼在香港附近上空經過，不是每一天都發生的事，如果沒有高空資料，將會是專業上的一大憾事。所以決定立即轉為人手放波，我負責監察電腦接收資料，彩雄負責放氣球。」

葉：「我將需要轉為人手放波的決定向屈 Sir 匯報，他又再次囑咐要衡量安全方可人手放波。那時雖然橫風橫雨，但相信情況仍許可人手放波，於是我全副裝備，雨衣雨帽雨靴，拉著充了氣的氣球到戶外，那時被強風和氣球拉扯得站立不穩！放第一個波時，氣球根本無法上升；放第二個波時，阿楊示意電腦收不到任何資料；放第三個波時，數據有錯誤；直至放第四個波時，風好像稍微減弱一點，氣球才順利升空進行探測，阿楊亦示意電腦接收資料正常。」

楊：「我們終於鬆一口氣，那時已經是差不多凌晨三點，雖然比原定放波時間遲了約一小時，但總算能蒐集到寶貴的高空氣象資料（圖一），相信這些資料對颱風研究一定很有用。」

葉：「那一定，看到那些資料，真有如獲至寶之感！」

雷達眼，看風眼！

天氣雷達負責監測風暴的風力、雨帶強弱和氣旋中心位置，因此天氣雷達是監測熱帶氣旋不可或缺的觀測手段。

韋森特襲港當晚，在大帽山上的雷達站「當風更」的兩位雷達機械師李浩然和陸嘉樂正埋頭苦幹，確保雷達系統能繼續「歎冷氣」。

李：「雷達系統跟其它電子儀器一樣，不能過熱，否則無法正常運作。十號風球那夜，大帽山雷達站的中央冷氣發生故障，為了確保雷達不會停止運作，我和嘉樂便將站內所有流動冷氣機搬到雷達儀器室內，全力監控溫度，確保儀器室溫度不會過高。幸好整夜大帽山雷達維持正常運作，無論預報員還是市民大眾，都可以通過雷達影像一睹韋森特的風眼與環流(圖二)。」

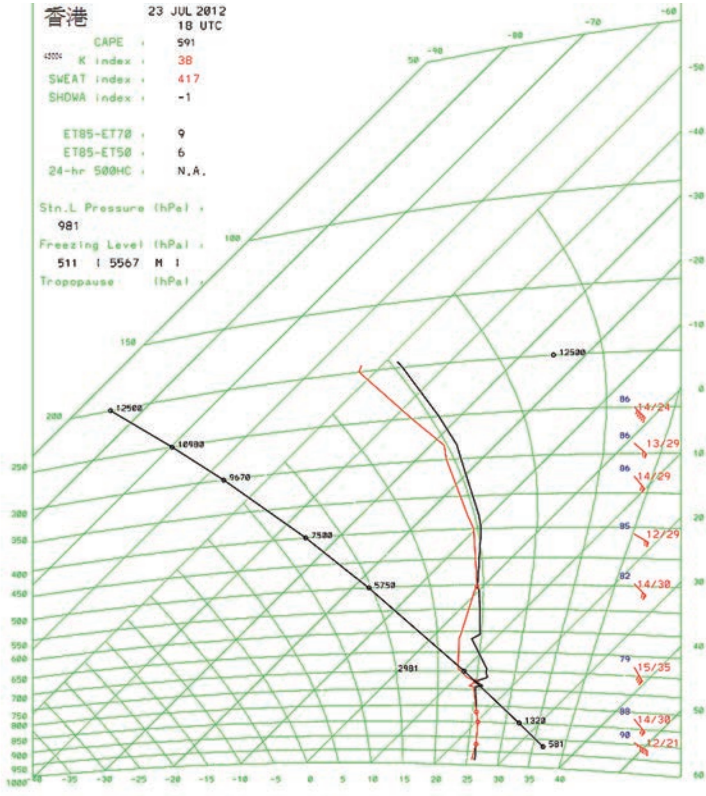
那邊廂，另外兩位雷達機械師盧偉雄與葉永成在大欖涌的機場多普勒天氣雷達站「當風更」。上一次1999年9月颱風約克的「十號風球」時，盧偉雄在大帽山雷達站留守三日兩夜，至今仍印象難忘。十三年過去，他再次親身經歷另一個「十號風球」的故事。

盧：「當晚機場多普勒天氣雷達發生故障，由於在暴風雨的晚上，仍有飛機升降，多普勒天氣雷達監測機場跑道的風切變對保障航空安全尤其重要。當時風勢相當大，我和葉永成需要合兩人之力，才能打開儀器室的門，到裡面努力搶修，至雷達終於回復正常運作，我們才如釋重負。」

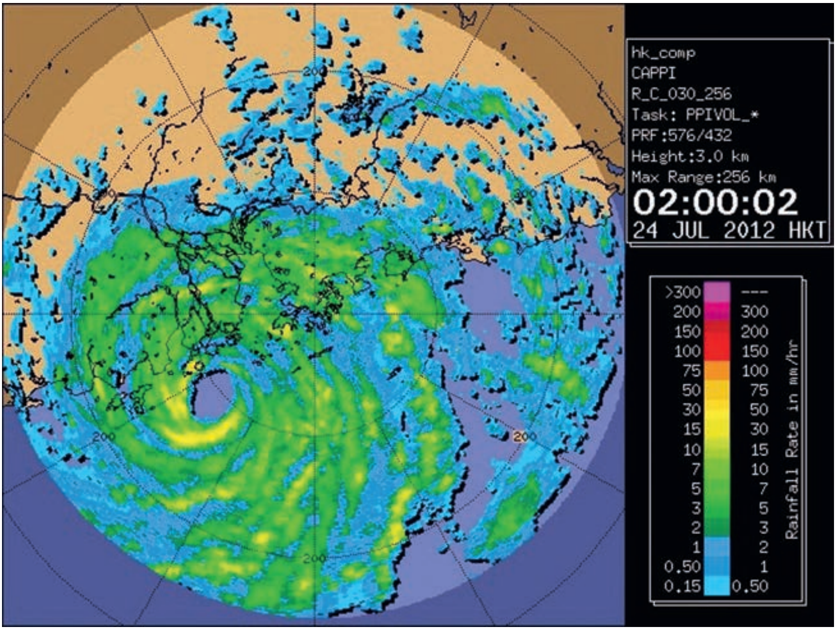
言簡意賅，向前線人員致敬！

聽過幾位同事談論韋森特「十號風球」時的工作情況，更深切體會他們無懼暴風雨致力維持天氣觀測正常操作的堅定信念。

以後無論我在網頁瀏覽氣象觀測資料，或是利用資料進行分析研究，也會明白整整齊齊的數據得來不易，確實要向恪盡職守的前線工作人員説聲「謝謝」！



圖一　2012 年 7 月 24 日凌晨由探空氣球蒐集的高空氣象資料繪製成的温熵圖，顯示在韋森特風眼附近的高空氣温、露點、風向及風速變化。



圖二　2012 年 7 月 24 日凌晨二時的雷達圖像，可清楚看見韋森特的「風眼」。

我在天文台的旅程 - 開始

李鳳瑩
Lee Fung-ying

Miss FY Lee joined the Observatory as a Scientific Officer in 2011. In this article, Miss Lee describes her personal feelings when joining the Observatory as a new staff. She also describes the nature of work of a scientific officer at the Observatory in this modern age. This article looks into the work of the Observatory from the angle of a new staff, which contrasts with other articles which look from a historical perspective. No matter in the past or present, all articles illustrate the succession of “passion” of the Observatory staff from past to present.

二零一一年五月，我有幸加入天文台。每次回望過去，總覺得時間過得特別快，原來我不經不覺已經加入天文台超過一個寒暑。當然，相較於天文台裡一眾資歷甚深的同事，我仍然算是一個「新人」，仍然有一段很長的路要走。每一個新加入天文台的科學主任都有機會被派到外地接受基礎的氣象預測訓練，我也沒有例外。執筆之時，我正於 Exeter 的英國氣象局接受為期四個月的天氣預測訓練課程。這一次慶幸能夠被派到英國，在學習氣象知識和了解英國氣象局運作的同時，還可以體驗英國悠遠的歷史文化，對我而言，更有深遠的意義。

加入天文台工作是我從小的志願。或許是因為在離島長大的關係，從小便深刻感受到大自然天氣變化對我們生活帶來的影響，而看著時時刻刻變化的天氣更培養了我對氣象的興趣。尤記得面試科學主任時被問到的其中一條問題是「甚麼是風暴潮？」。風暴潮是由熱帶氣旋或其他強烈的天氣系統引起的海面異常升降現象。當時我就立即想起小時候家住海邊，曾經看過打風時海平面上升，海浪淹沒整個沙灘及直接打上路邊的壯觀畫面。雖然當年我只有四、五歲，但那畫面卻讓我留下了深刻的印象。

我在大學主修物理學，但天文台並不是我畢業後的第一份工作。加入天文台之前，我曾經在一所會計師事務所當審計員。天文台聘請科學主任的空缺不多，而且並非每年也有空缺。大學畢業那年雖曾申請科學主任的職位，可是面試的機會也沒有。二零一一年機會終於來臨，有幸在云云應徵者中被錄取，我立即就接受了這工作。身邊許多朋友和同事都對我的轉變感到很驚訝，因為他們覺得審計與天文台的工作是屬於兩個截然不同的範疇。但對我來說，這是一個期待以久的機會，能加入天文台工作是我的榮幸，而且更能圓滿我兒時的夢想。

加入天文台之前，我和大部分市民一樣，只是透過天文台的網頁、新聞報導，或者是一年一度的開放日等渠道了解天文台的運作。加入天文台之後，我發現科學主任的工作比我想像的更加多元化和具挑戰性。原來天文台的服務及工作範圍很廣泛，除了基本的天氣預測、航空氣象、輻射監測等日常業務運作外，還有預報產品開發及研究、硬件維護、企業傳訊、培訓及公眾教育等細分的部門。作為一個科學主任，除了需要具備專業的氣象知識以外，還要有良好的管理及行政技巧、傳媒技巧、溝通技巧、電腦應用技巧、科學研究技巧和應變能力等等。雖然在英國的訓練課程即將結束，但回港後我還有更多需要學習和進步的地方。

最後，我想藉此機會，衷心感謝這一年多來所有幫助過我的上司們和同事們，不論是工作上的指導，或者是閒時的經驗分享，都使我獲益良多。期望回港後能與大家並肩一起，為天文台作一分貢獻，為香港市民服務！

二零一二年英國氣象局基礎氣象預測訓練課程導師與學生合照。第二排右三科學主任李鳳瑩，第三排右二科學主任江如秋。

新足舊跡

司徒感恩
Seto Kam-yan, Constance

In this article, Ms Seto, Supplies Officer newly posted to the Observatory, takes a look at the Observatory and the work of its colleagues in a sentimental manner. She shares her feelings about the Observatory first as an outsider when she arrived 13 months ago and up till now when she has integrated to become part of the family.

天文台，祝你生日快樂！

在你一百三十年的歲月中，我很榮幸能夠留下點點足跡。年深月久，當我們習慣了身邊的事物時，當初多新鮮好奇的東西，一切都會漸漸變得平常、平淡。趁我對你的好奇心仍未褪色之際，讓我回味一下與你的相遇，和你帶給我那些新奇有趣的體會，好嗎？

相遇

二零一一年八月某天，炎陽高掛。我走過被熱氣籠罩的繁忙鬧市，踏上斜路，來到一個閘口護衛亭前。舉目四看，進入眼底的，是一棵棵又高又大又密的樹木，那刻，內心既疑且嘆。疑惑者，是究竟自己去到一個樹林，還是真的到達天文台總部？驚嘆者，乃是閘前閘後如兩個完全不同的世界，閘前的石屎森林，跟閘後的綠樹林蔭，相映成趣。道明來意後，護衛示意向前走。越過護衛亭，如踏進另一片天地。沿小路而上，人聲車聲已遠離耳朵，只聽見自己的腳步聲。小路兩旁，樹影婆娑，鳥語葉香。頃刻，心裡不禁問：「我真的是身在尖沙咀嗎？這些樹木年紀有多大？這座小山丘在一百多年前的面貌是如何呢？」

你我相遇，始於一個又一個問號。

微笑

續向前行，小路盡頭，竟又是另一片天地。眼前，屹立一座富殖民地色彩的古老大樓，兩旁綠油油的小草地，和草地上不知名的小儀器，如小朋友伴著老巨人般，獨顯古老大樓的典雅優美。從前只在報紙雜誌上看到的景象，現在置身其中，竟有點不實在的感覺。你那寧靜優美的環境，叫我差點忘記，數分鐘前我才在混濁喧囂中走過。縱然身在繁忙都市中，你卻依然保持那份恬靜優雅，我想，你真有個性！

定過神來，走進古老大樓旁的黃色建築物，來到三樓物料供應組，預備交接工作。交接過後，拾級離開，心裡微笑著對你說：「很高興認識你和你的老友記們 —— 樹木、鳥兒、草地和古老大樓。往後每天我都可以跟他們見面打招呼，真好！」一個月後，我便帶著這個微笑，開展了在你這裡工作的歲月。

相識

至今，和你相識已十三個月了。在我心中，你依然如一個大寶藏，藏著許多有趣的東西，有待發掘。因工作性質關係，我認識到不少同事，也「參觀」過各部組辦公室、氣象站和雷達站等。對於我這個對天文氣象全無認識的人來說，每聽到同事們講解與氣象、輻射或信息服務等有關的儀器、系統、運作及各式各樣的知識時，總感到新鮮新奇。當我置身於天氣預測總部（CFO）、各氣象站和雷達站時，就更如劉姥姥入大觀園，一切讓我嘆為觀止。

偶遇

若你問我，令我印象最深刻的是什麼？我會說，是一次在 CFO 的「偶遇」。那天，我甫踏進 CFO，瞥見一列列螢光幕，和同事們一副副專心嚴肅的神情時，就好像走進什麼基地似的，感覺有點冷冰冰。於是，我努力搜索冰冷以外的東西。終於，給我看到其中一度牆壁，上面掛著一幅幅天氣圖，如牆紙般整齊地貼於其上，那鋪陳出來的視覺效果，非常有趣，也點綴了冰冷的 CFO。未及仔細欣賞那列「天氣圖牆紙」，眼睛已被另一幅鋪在桌上、尺寸更大的天氣圖吸引著。此大圖之特別，乃在於圖上那些以人手繪畫出來的等壓線，運筆蒼勁有力，蜿蜒的圖線，圓轉自如。看到如此一幅充滿美感的圖表，心中讚嘆之餘，也發出了一個問號：「為何不以電腦繪線呢？」四處探問，才得知這是一

個優良傳統 —— 透過細閱圖上的資料、親手繪線，每位負責預報天氣的同事對天氣情況的掌握更深刻、其分析能更深入、更透徹。這次偶遇，令我想起一位同事曾說過，天氣預報是一種藝術。我很好奇，究竟這是一個怎樣的境界？當然，我不會知道。但我肯定的是，當科學與藝術走在一起時，所產生的火花定必美麗、特別、蘊意深遠的。

相知

細想一下，是誰將科學知識和實用有效的服務，結合得如此精彩？對了，不就是每天在你這裡努力工作的同事們嗎？來這裡之前，我對你的認識只限於氣温、濕度、雨量、颱風信號和一些警告。來到這裡後，才知道還有許多許多我不懂、卻又與我們生活息息相關的知識。在你以內，每一個工作崗位，環環相扣。由科學知識變成有利公眾的信息，同事們真的功不可沒。然而，在這公眾期望和要求日益提高的年代，同事們的工作壓力也相應不斷增加，他們如何應對？他們有灰心氣餒的時候嗎？什麼力量推動他們向前走？

我相信，每位選擇投身天文台的同事，當初總帶著不同的使命感、抱負、理想、熱誠或期望，走進你的懷抱。今天，他們還記得自己當初的期盼嗎？他們還有堅持嗎？若有，還在堅持什麼？在新舊事物之間，他們昔日的好奇心仍在嗎？若不慎失掉了這份好奇心，你會陪伴他們去尋找嗎？

我也會問，我自己呢？我應如何更有效地支援你和你的同事？我沒有專業的科學知識，我能夠為你作什麼？我對你那份無知的好奇，你會覺得可笑嗎？你自己又如何？身處這科技一日千里、知識資訊瞬息萬變的年代，你如何回應？在不斷追求發展與卓越，和回歸基本與自然之間，你會如何取捨與平衡？

意想不到，你我相知，竟帶出更多的問號。

前路

若干日子後，我也會離開你，調任到其他部門。我想像，到時我會捨不得你、你的同事、和這裡一草一木。今天，我很珍惜在你這裡的歲月；別離後，我也會懷念這裡帶給我的回憶。

若歷史是一座巨山，你已攀過了一百三十年，所累積的知識、經驗和體會，肯定是非常豐富和寶貴的。未來的路，你縱然會面對更多挑戰，我也盼望你能保持你的個性、熱誠，站得更高、望得更遠，秉持科學為民的精神，為社會作出更多的貢獻。

祝願你前路的風光更美好！

好奇帶來的小發現 — 天文台小草地上的露珠，猶如大自然水晶，晶瑩剔透。美麗的寶藏，就近在咫尺。除此之外，天文台還有許多知識和經驗的寶藏，值得善用與珍惜。

天文台愛心義工隊

陳穎珊、吳陳金珠、廖慧萍、周志堅
Chan Wing-shan, Angel, Ng Chan Kam-chu, Liu Wai-ping, Chow Chi-kin

The HKO Team of Volunteers, established in November 2000, serves as an ambassador linking HKO with the society. In 2001, they started with a fund raising campaign through selling cakes in subway stations for the elderly. Over the years, the activities of the team expanded to include charity walks, flag selling, visits to people in need, as well as special events to raise funds for victims of the tragic 2004 tsunami in south Asia and the severe Sichuan earthquake in 2008. Recently, our volunteers visited elderly service centres presenting them with souvenir of hand-woven woolen caps and well-received performances such as energetic dancing. The group received an award at the Civil Service Volunteer Action in 2008.

如果問起大家對天文台的印象，相信十居其九都會聯想到天文台是為市民提供各項天氣資訊的政府部門。今次特別為大家介紹天文台的另一面，雖然和天氣沒有直接關係，但同樣能夠體現天文台同事服務社會的熱誠，這就是天文台的愛心團隊 — 天文台義工隊。

天文台的義工隊於 2000 年 11 月成立。初期只有數位成員，談不上甚麼大規模，但位位骨幹隊員都是有心人，不斷向身邊同事熱烈推介。經過多次宣傳及招攬後，義工隊成員的數目逐漸增多。2001 年 8 月義工隊首次出動，在彩虹地鐵站大堂內承包了一個攤位，參與基督教靈實協會舉辦的「耆樂餅義賣籌款」活動。翌年義工隊再接再厲，在美麗華商場再次參與「耆樂餅義賣籌款」活動。連續兩年活動成績都非常理想，為每位成員打下了一道強心針，義工隊新的一頁亦由此展開。

義工隊在 2002 年參與「耆樂餅義賣籌款」活動

在往後的日子，義工隊參與的活動越來越多，當中包括慈善步行、賣旗、植樹、環保活動、為天災〔如南亞海嘯、四川地震等〕發起籌款活動、傳統節日製作粽子和月餅、學習多樣手工藝、探訪有需要人士、邀請兒童院參觀天文台等等。每一次活動，由籌備至正式進行，都會得到不少同事的積極支持，就連退休的同事也不例外，例如退休前為二級監工的伍添鴻先生〔伍師傅〕亦不時抽空回來參與義工隊的活動。

台長岑智明先生致送紀念品予退休同事伍添鴻，感謝伍師傅免費教導天文台同事製作毛巾公仔作義工活動之用

2010 年 11 月，天文台義工隊及職員會破天荒聯合舉辦了一次「天文台慈善賣物會」。這次賣物會的目的，主要是為義工隊籌集經費，作為日後探訪老人院及其他義工活動購買物資之用。活動中有多款由一眾義工親手製作的精美日用品供同事們選購，其中包括口金包、錢袋、冷頸巾、飾物、繩結、毛巾公仔、絲花

盆栽等。賣物會當天，義工隊隊員落力地向同事呼籲和推銷，不斷有充滿愛心的同事前來選購貨品，亦有不少善長人翁慷慨解囊，現場氣氛非常熱烈。最後賣物會共籌得萬多元善款，能夠在一天內籌得五位數字的善款，實在是一件令人十分鼓舞的事！

義工隊與職員會合辦「天文台慈善賣物會」

　　有了同事的善款，義工隊就能夠舉辦更多活動。例如近年義工隊在農曆新年的前後，均會安排一次探訪老人院活動，與長者們共慶佳節。每次活動前一兩個月，義工隊已經要利用工餘時間著手預備。總務部的女工忙於親手編織冷帽和冷頸巾，作為探訪時送給長者們的禮物。而負責唱歌跳舞的另一班隊員努力地綵排練習，務求為長者們表演一場精彩的歌舞。活動當日，義工同事還會介紹不同的天氣警告，公公婆婆聽得津津有味之餘，更喜歡與我們分享數十年前颱風襲港的軼事。看到公公婆婆的笑臉，聽到他們的掌聲，便是給予我們最大的肯定。

2011 年 2 月義工隊與彩虹長者綜合中心一班「老友記」齊齊影大合照

2012 年義工隊在新春佳節期間探訪順利邨圓玄護養院

天文台義工隊參與了義務工作十多年，很開心在 2008 年初得到公務員事務局的表揚。在「公務義工傳愛心頒獎典禮」上，義工隊獲頒「十週年服務大獎」及「熱心參與義工服務感謝狀」。雖然參與義務工作絕對是不問回報，但這些獎項對我們來說是一個很大的鼓勵，推動著我們要更努力做好義工的角色。

義工隊在 2008 年「公務義工傳愛心頒獎典禮」中獲獎

助人為快樂之本，幫到別人，自己同樣感到喜悅，何樂而不為！天文台義工隊會繼續參與不同的義務及公益活動，期望可以見到更多新力軍加入這個愛心團隊，將天文台的愛心一直傳揚開去。

小品三則

「天文台之友」：關冠華、劉浩泰、劉敏琪

Friends of the Observatory : Kwan Koon-wah, Roger, Lau Ho-tai, Eric, Lau Man-ki, Pansy

There are many ways to get to know the Hong Kong Observatory, say, from TV weather programmes, broadcast of weather information through radio, public talks, open days, regular guided tours, etc. But don't forget the "Friends of the Observatory", a volunteer group founded in 1996 to help promote weather education. Let's listen to the sharing of three of the Friends.

一同成長 —— 關冠華

廿多年前，當我開始對氣象產生興趣時，已十分留意天文台這個政府部門。當時如想一窺天文台內貌，就只好透過科學主任於電視上主持的天氣簡報或熱帶氣旋報告。這一份半帶神秘的感覺促使年輕時代的我立志成為天文台科學主任。

廿多年後的今天，雖然沒有夢想成真，但天文台的逐步開放，卻讓我可藉著另一途徑成為這機構的一份子 —— 一切要從「天文台之友」的成立說起。

1996 年 6 月，我在香港科學館舉行的「氣象認識班」中第一時間報名參加快將成立的「天文台之友」，往後的活動不單讓我有機會經常到訪天文台總部，更給我機會參觀平日無法到達的地點和設施，例如機場氣象所、大帽山雷達站、自動氣象站等。

直至1999 年，「天文台之友」增設義工服務隊，會員有更多機會接觸天文台之餘，亦可以通過這一個平台結識新朋友，一起回饋社會。

十多年來，透過參加「天文台之友」的不同活動，能讓一眾「天文台之友」踏足平時不能到達的天文台設施。當年赤鱲角機場仍未開幕時，便難得有機會到機場氣象所參觀。

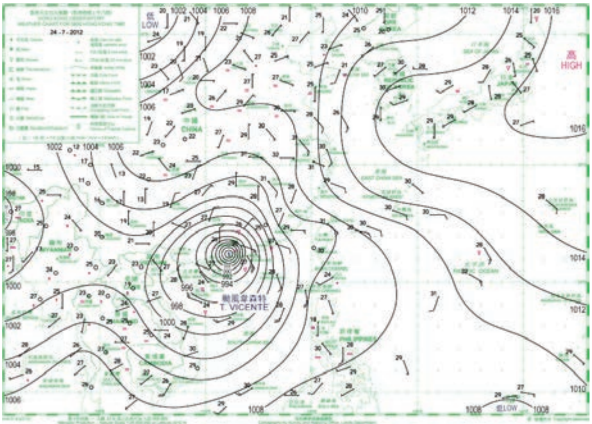
近年來，「天文台之友」的活動愈見多采多姿，例如考察橫瀾島、籌辦氣象營、與澳門氣象局進行交流...... 由當初對氣象和天文台的興趣開始，今天我身兼組織的委員和義工，可以說「天文台之友」伴我一起成長，亦大大擴闊了我的視野。

雖然我沒有成為科學主任，但實在沒有一點兒遺憾，我可以通過「天文台之友」從另一角度了解天文台，確是一份喜悅。只要繼續有「天文台之友」這個平台，深信一眾會友對氣象的興趣和對天文台的熱誠定能保持下去。

天氣圖說故事 —— 劉浩泰

我從小對等壓線天氣圖情有獨鍾，而天氣圖對於預報員來說亦是很基本而且很重要的資料，上面記載的就是不同地方的氣壓，把相同氣壓連成不同的曲線，就成為一幅等壓線天氣圖。

等壓線天氣圖一般都會由預報員根據氣壓資料，配合經驗判斷一筆一筆的繪畫出來。另外，預報員更會根據資料在天氣圖分析低壓槽、冷鋒、甚至熱帶氣旋等天氣系統。



2012 年 7 月 24 日受強颱風韋特森吹襲，香港天文台曾發出十號颶風信號。

香港天文台繪製的天氣圖至今已經超過100年歷史。由最初只是在香港各碼頭張貼單一顏色天氣圖，到今天在互聯網發佈彩色並附有其他天氣資料的天氣圖。每一張天氣圖都見證著天文台為市民分析和預測天氣的努力，而我亦不時把有趣或有重大意義的天氣圖存檔。

或許，從今天起，大家都可以多一點細看天氣圖，它就像相片一樣，為我，為你，為大家記錄著香港的天氣狀況。

僅存在天文台的最舊天氣圖(1909年)

認識天文台，從「1883」開始 —— 劉敏琪

首次到訪香港天文台總部，是中學時代的事，對於「創台」建築物「1883 大樓」的印象已近乎零了。

2008 年，為了天文台導賞員面試重臨舊地。緩緩踏上通往天文台的小斜坡，兩旁種滿大樹，令人恍如置身一片小森林當中。經過數分鐘路程，拐了一個大彎後，眼前豁然開朗，兩旁是放置氣象儀器的青草地，盡頭是一座兩層高、設計風格兼具典雅與簡約的大樓——1883 大樓。

1883 大樓吸引我的目光，也擴闊了我的眼光。認識香港天文台，不但可以從創立的年份開始，也可以從地標 1883 大樓開始。

於 1984 年成為法定古蹟的 1883 大樓，建築風格反映殖民地建築特式——以殖民地本土物料為建材，設計適應本土氣候。地下以花崗岩地台升高；寬敞的迴廊和露台配以拱形窗，通風、遮蔭、擋雨，令室內不受天氣影響；高樓底有助室內空氣對流等，全都為香港炎熱、潮濕多雨的氣候而設。1883 大樓所擁有的科林斯柱（Corinthian Order ——特色是柱頂形似盛滿花草的花籃）更是香港少有的希臘式建築柱式。

尖沙咀 4 幢法定古蹟及多幢獲評級歷史建築物中，三項都是和天文台相關的建築物，除了 1883 大樓外，還有尖沙咀山上法定古蹟前水警總部（今 1881 Heritage 酒店）的時間球塔（1885-1907），及黑頭角（又名大包米，即現今訊號山）的一級歷史建築物訊號塔（1907-1933）。

天文台成立初期，報時屬其中一項主要服務。為了讓維港船隻上航海人員清楚看見時間球，時間球必須置於高處。隨着廣泛

應用無線電廣播時間，時間球早已光榮退役，以上三項和天文台相關的建築物，亦隱藏於尖沙咀石屎森林之中。

希望一睹1883 大樓風采以及進一步了解天文台工作的朋友，可以出席每年3 月舉行的天文台開放日，以及參加每月舉辦的「天文台全方位遊」、又或者與我一樣，加入天文台之友和義工行列，與天文台近距離接觸！

烈日當空下，站在1883 大樓寬敞的遊廊上，非常涼快！柱上的裝飾花紋就是科林斯柱的特色。

細數風雲

Weather and Records

130 有緣相聚

Under the same sky

細數風雲 Weather and Records

Three Tropical Cyclones & a Rainstorm

劉志鈞（台長：1995-1996）
Lau Chi-kwan, Robert（Director：1995-1996）

劉志鈞先生以生動的筆法重現1971年小型、移動緩慢及90度轉向的颱風露絲，1979年猶如一輛風馳電掣的法拉利跑車的颱風荷貝，1969年辣手的維奧娜，以及1992年引致暴雨警告系統成立的一場豪雨。預報員的心情，驕傲或沮喪，擔憂或滿足，自然地流露於字裡行間。

Typhoon Rose 1971

In 1971, there was a typhoon called Rose, a Number 10 typhoon that wreaked havoc and destruction, sank half of the Hong Kong-Macau ferry fleet and became our most violent storm since the infamous Wanda of 1962. Thankfully, casualties were comparatively light and the Observatory was actually lauded for perfectly timing the hoisting of the various typhoon signals. Had the warnings been inadequate, the loss of lives and damage to properties could easily have been tenfold or more. Typhoon Rose was a dangerous midget of a storm, being nearly invisible on the weather charts. It possessed only a narrow gale band in its northern half, yet packed extensive storm force winds south of its centre. Having moved west and reached due south of Hong Kong, it decided to make an abrupt right-angled turn. For the next 20 hours, Rose stealthily drifted north at 5 knots and eventually hit the bull's eye - Hong Kong Island.

Remember, these were the pre-geostationary satellite days. In the South China Sea, 6 hourly ship wind reports were the only available ground truths. Unhappily, with storms around, ships naturally stayed away. What gave the forecasters a firm inkling that Rose was continuously approaching was NOT a sharp atmospheric pressure drop, NOR a significant strengthening of local winds. It was the unrelenting increases of "microseisms" recorded by the seismometers. So, since microseisms are microearthquakes caused by joint pressure and wave actions around the typhoon centre, it was actually the Observatory's earthquake team who triumphed. Who would have thought that for Rose, the geophysicists would come to the rescue of the meteorologists!

Another aspect worth relating about Rose is that both its track and its main features were not dissimilar to Cyclone Tracy in Australia in 1974. Tracy also made an abrupt sharp turn, before hitting Darwin and almost wiping that city off the map on Christmas Day 1974. So for any aspiring typhoon expert seeking a research topic, you cannot do better than a comparative study of Rose & Tracy. You never know, you just might discover a General Theory of Typhoon Steering applicable to both the Northern and the Southern Hemispheres.

Typhoon Hope 1979

Compared to Typhoon Rose, Typhoon Hope 1979 was a supercharged Ferrari. Hope, an August typhoon, moved at breakneck speed westwards. At one stage, the forward movement was at an unheard of 28 knots. Necessarily therefore, in order to provide the minimum of 6 hours' warning before gales arrived, the Number 8 Gale Signal had to be hoisted when Hope was some 150 nautical miles away. That was exactly what the Observatory did on this momentous occasion. Up went the Number 8 so early that local winds were not even fresh. For the Observatory that was without precedent. And for the forecasters: if Typhoon Rose was a feather in their caps, Typhoon Hope won them the Gold Medal for Meteorological Audacity. The decisions of when to, and whether to, hoist the Number 8 were crucial and agonising. Going through the forecasters' minds were so many what-ifs. What if Hope slowed down a shade? What if Hope tracked a little north of west? What if Hope dramatically weakened? To cut a long story short, the science of upper air steering mercifully worked for the case of Hope. A small low at 300 millibars level was diagnosed to precede but otherwise travel in unison with Hope's surface circulation. That was the scientific basis, the confidence rationale and the decision clincher. It worked, it worked gloriously! But will it work again? That's another research project.

Typhoon Hope was also a raging success for the Observatory's Storm Surge Unit in that it was the first time a Storm Surge Advisory was issued to the public. Tide gauge records inside Tolo Harbour afterwards showed a storm surge of above 3 metres, which was on par with the surges experienced during Hurricane Katrina in New Orleans decades later and those from Hurricane Sandy experienced in New York city just recently.

On the lighter side, this comes to mind. On the charts, there was a storm named Gordon, before Hope developed. (Storms were named alphabetically then and H follows G.) The then Director was on leave during Hope. He was Director Gordon Bell who had already served for 15 years. Understandably, the Acting Director (John Peacock) was slightly impatient, having long to wait in the wings. After the passage of Typhoon Hope, a naughty phrase surfaced and was often heard. It was: "After Gordon, there is hope"!

Viola 1969

As in life generally, even the Observatory cannot have only success stories. How about typhoon signal hoistings being compromised by a single overstated wind report? That actually happened during Tropical Storm Viola in 1969.

Viola was not a calamitous storm. Far from it. During Viola's nearest approach, more than 60 nautical miles to the north, only a few hours of strong winds were experienced. Otherwise its effects were minimal locally. However the sequence of typhoon signal hoistings associated with Viola left a great deal to be desired and brought a fair amount of public outcry. There were the initial Number 1 and Number 3 hoistings; followed by all signals being lowered; to be followed later by a re-hoisting of the Number 3; THEN a hoisting of the Number 6 (equivalent to the present SW Number 8); which was quickly corrected within half an hour; being replaced by a Number 3 again. Complicated? Quite. Afterwards, the media produced an appropriate numeric name for Viola - the “130363 Storm”.

What happened? The track of Viola tells part of the saga. When Viola moved west-northwest across the southern part of the Taiwan Strait, the usual Number 1 and then the Number 3 signals were hoisted. When Viola landed (around noon at some 150 miles east of Hong Kong) and moved inland into eastern Guangdong, its threat was over, or so it seemed. All signals were lowered. To everyone’s surprise not only did Viola maintain its circulation and strong winds but it continued on its merry way towards Guangzhou, after being overland for half a day. Thus the Number 3 was re-hoisted to provide warnings of impending strong winds in Hong Kong in the southern part of Viola. At the Observatory, it was tense monitoring, hour after hour, waiting for Viola to pass. And shortly after Viola came closest (we knew the exact moment, because the barometric readings kicked sharply up), there was euphoria, a big sigh of relief, pride and joy. It was proven: the situation with Viola did not warrant a Gale Signal. We had dealt with Viola adequately with a Number 3, AS FORECAST.

In the event, that was not to be. Not long afterwards, a radio message from Waglan Island reported gale force winds. The reported figure was checked, double checked and confirmed. The Observatory had no choice. The Gale Signal had to be hoisted, albeit operationally, and so it did. Nightmare followed. No sooner had the Number 6 gone up than it was discovered that the earlier gale report from Waglan was raw data. Which meant that after correction for Waglan's extreme offshore exposure, there were, after all, no gales. The situation was corrected quickly and down came the Number 6 in a hurry, replaced by the Number 3. What a mess.

For the record, Observatory's prestige came down a few notches after Viola. But then we have taken Viola in our stride. Without Viola, we probably would not have appreciated the great triumphs that were Rose and Hope.

Tracks of Rose, Hope and Viola

Rainstorm 8 May 1992

Rainstorms are no strangers to Hong Kong. Every year, the last weak front from the north around late May invariably lingers and usually brings torrential rain. During the first weeks of June, the Mei-Yu Trough in the South China Sea crosses the coast with its seasonal deluge. Hourly rainfall amounts of 100 millimetres or instantaneous rainfall rate of over 500 mm/hour are not too uncommon.

In the annals, there was a landslip disaster in June 1972 dubbed the "Rainstorm Domino Effect - Hong Kong Style". An entire apartment block in Kotewall Road toppled and dominoed onto another highrise in absolutely blinding rain.

The rainstorm recounted below was rather less spectacular, but arguably more significant. For it was the "reason-to-be" for the introduction of the Red & Black Rainstorm Warning System.

May 8 1992 was a classical heavy rain day. Moisture-laden airstreams, highly unstable atmosphere – all the typical rainstorm ingredients were present. Appropriately, the Thunderstorm Warning, the Landslip Warning and the Flood Warning were all in force. YET, at 5:15 a.m., the Duty Forecaster at the Central Forecasting Office could only find scattered echoes and definitely no organised rainbands on the radar screen. Over the phone, he was unable, or maybe slightly disinclined, to persuade the Duty Officer of the Department of Education to agree to a general school closure announcement to be broadcast at 6 a.m.

As it happened, rain commenced before 6 a.m. By 6:15 a.m., the radar rain picture was alarming. Heavy rain had developed suddenly, explosively and ubiquitously. By then the Observatory was frantically seeking out the Director of

Education to request for an unscheduled and belated school closure announcement. It was to no avail.

That morning, peak hour traffic everywhere was gridlocked. Major arterial roads were like parking lots. It was weather Armageddon for a million commuters. And when the rain subsided, the to-be-expected public condemnation came from every which way. Fingers were pointed directly at the Observatory and the Department of Education. There were media roastings, adverse headlines, and Legislative Council hearings.

The upshot: The Observatory was given two weeks to devise an effective Rainstorm Warning specifically for Hong Kong. There you have it. You know the rest. What a historical rainstorm! What a Red & Black Rainstorm Warning! In its operational form, millions of people are currently being served. From humble beginnings, rainstorms & a Rainstorm Warning System grow.

A torrent of rain water rushing down the slopes of Hong Kong Island during the heavy rain on 8 May 1992 (photo by South China Morning Post)

Typhoon 1874

呂永康、莫慶炎
Lui Wing-hong, Mok Hing-yim

香港自開埠以來經歷了不少的風災，其中一八七四年九月的甲戌風災引致香港及澳門有重大傷亡，亦可能促使了香港天文台於一八八三年的成立。本文從一個歷史的角度描述這一個颱風在香港引致的傷亡及破壞。甲戌風災及其後出現的風災帶出了一個重要的信息，就是香港處於南海北部，過去曾受到颱風帶來的嚴重破壞及傷亡，展望未來，在全球氣候變暖有可能帶來更頻密極端天氣的背景下，市民對颱風的吹襲需要保持高度警覺。

A typhoon struck Hong Kong and Macao during 22 - 23 September 1874, bringing severe damage to these places during its passage. This typhoon, known as Typhoon 1874, might have prompted the establishment of the Hong Kong Observatory (HKO) later in 1883. As Typhoon 1874 occurred in the year 甲戌 in the traditional Chinese calendar, the episode was also known as 甲戌風災 in Chinese.

Although HKO had not yet been established in 1874, weather observations by the Police and the Harbour Department were available in Hong Kong and were published in 'The Hong Kong Government Gazette' of 17 October 1874 (hereafter referred to as the Gazette). It was reported that local winds suddenly shifted to the northeast and then to east-northeast and blew with terrible violence in the morning on 23 September. A minimum pressure of 978.0 hPa (28.88 inches of mercury) was recorded in the Hong Kong harbour at 2 a.m. whereas the Central Station of the Police reported a minimum pressure of 972.9 hPa (28.73 inches of mercury) at 2:03 a.m.

As described in a Chinese book [廣東的自然災害] [1] on the natural disasters in Guangdong, Typhoon 1874 affected many places in the coastal region in Guangdong. Several thousand people were killed in Hong Kong. The damage in Guangdong is described in detailed in another Chinese book [中國氣象災害大典：廣東卷] [2] on a collection of meteorological disasters in China (Guangdong Chapter):

「(9 月 21~23 日)，颶風並潮大作，風從海上起，頃刻潮高兩丈，濁若泥滓。勢狂暴為向來所未見，拔木毀屋傷稼，沿海禾被災殆盡。澳門小欖同時火災，水火風交煽，壞船千餘，溺死萬人，撿得屍者七千，香港死者數千，毀民用醫院及聖約瑟堂，緝私船亦壞，自參將以下武弁死者十餘人，赤溪直隸廳平地水深四尺，火光遍地，壞廳署、東西轅門及城忠勇祠，淹沒田廬、人畜無算。圍破塘決，沿海民被淹受傷最重。東莞、新會、新安次之，南海、番禺又次之。風由東南上西北，至肇慶止。」

Damage inflicted in Hong Kong is illustrated in Figure 1.

Figure 1 (a) The Aberdeen Dock destroyed by the passage of Typhoon 1874

Figure 1 (b) The Praya, Government Wharf and Boat house on Hong Kong Island destroyed by Typhoon 1874

Damage and casualties in Hong Kong during the passage of Typhoon 1874 were tremendous. 'Hong Kong Typhoons', published by HKO in 1950 [3], recorded that 'the typhoon demolished the Civil Hospital and St. Joseph's Church [same as the above record in Chinese]. A warship dragged her moorings and was thrown into V.R.C. boathouse'. As described in the report by the Captain Superintendent of Police published in the Gazette, the Police had recovered the bodies of 621 people, but this number probably represented only one third of the actual figure. Furthermore, over 200 houses were destroyed or rendered uninhabitable. Two steamers sank in the harbour and another steamer was on shore near Aberdeen, and eight ships were supposed to have been lost. It was impossible to estimate the destruction of junks and small boats. Telegraph posts were blown down in different parts of the Hong Kong Island, interrupting communications. The roads were almost impassable from the obstruction caused by the fallen trees. The China Mail of 23 September 1874 also reported that 'A typhoon, though of very short duration, has probably proved the most destructive witnessed since 1862 – if not exceeding it in that respect – swept over the island between the hours of 6 p.m. and 6 a.m.'.

Like many other historical typhoons which caused significant casualties, the deadliest impact of Typhoon 1874 was its associated storm surge. In a report by the Harbour Master published in the Gazette, it was recorded that 'The strength of the wind brought an immense volume of water into the harbour, not a tidal wave, but a rapid rise which continued for about an hour, flooding the Praya and ground floors of houses to a height of 4 and 5 feet for some distance in shore……By three, the water had risen to five to six feet above its high water level, or a rise of about ten feet had taken place.'

Typhoon 1874 caused severe damage to Macao as well. In Macao, the Portuguese Navy started to carry out meteorological observations since 1861, before the establishment of the Macao Meteorological and Geophysical Bureau in 1952. According to the analysis of Macao Meteorological and Geophysical Bureau[4], Typhoon 1874 was one of the strongest typhoon ever known to hit Macao during the 19th Century, with a maximum wind of about 170 km/h and a minimum pressure of 935 hPa near its centre. The passage of Typhoon 1874 was accompanied by storm surge which caused severe flooding of up to 2.5 metres above the road level. The total number of fatalities and people missing amounted to about 5,000 with an economic loss of up to two million Macao dollars. Figure 2 shows the inner harbour of Macao after being hit by Typhoon 1874.

Applying the Observatory's operational storm surge model to Typhoon 1874, whose track has been re-constructed from the analyses of historical weather observations recorded by

Figure 2 Inner harbour of Macao after being hit by the typhoon of 22-23 September 1874 (Courtesy of Macao Meteorological and Geophysical Bureau)

the Police and the Harbour Department in Hong Kong, the Portuguese Navy in Macao and the Manila Observatory in the Philippines, Typhoon 1874 is estimated to have brought a storm surge of around 3.0 m (4.4 m) and sea level of around 5.2 m (6.5 m) at Quarry Bay (Tai Po Kau) during its passage, comparable to those observed by the Harbour Master in Hong Kong Island.

Following the establishment of the HKO in 1883, a number of typhoons have brought significant casualties and inflicted severe damage to Hong Kong, including the typhoon of 18 September 1906, typhoon of 1-2 September 1937, Typhoon Wanda of 1 September 1962 and Typhoon Rose of 16-17 August 1971. Facing the South China Sea, Hong Kong has been exposed to the onslaught of significant typhoons in the past and has experienced severe flooding due to storm surges. As more frequent extreme weather events are expected in the future as global warming progresses, people in Hong Kong should be aware of these threats to them and should always be on the alert during the close passage of severe typhoons.

References:

[1] 廣東的自然災害，梁必騏主編，葉錦昭副主編，廣東人民出版社，1993

[2] 中國氣象災害大典：廣東卷，主編温克剛，本卷主編宋麗莉，氣象出版社，2006

[3] Hong Kong Typhoons, G.S. P. Heywood, M.A., M. Sc., 1950

[4] 22/23 September 1874 typhoon – reconstruction, Antonio Viseu, Sau Wa Chang, In Tai Lee, Macao Meteorological and Geophysical Bureau

風暴潮：1874-2100

黃永德博士
Dr. Wong Wing-tak

Storm surge associated with tropical cyclones can devastate communities over coastal regions. Dr. Wong recounts historical storm surge events which wreaked havoc in Hong Kong. He uses recent examples, local and abroad, to illustrate that storm surge continues to be a threat to modern cities, particularly when global warming is taking place. He asks for increased awareness in natural disaster prevention and proper measures to protect life and property.

颱風是影響香港的重要自然災害，歷史上曾造成極為嚴重的人命傷亡和財物損失，主要原因是風浪吹翻船隻，其次是伴隨颱風的水漲造成海水氾濫淹沒沿岸低窪地區。後者過去曾被稱為「氣象海嘯」，以區分由地震觸發的地震海嘯，後來被冠以更為貼切的名字，稱為「風暴潮」。

香港本是一個漁港，除了漁船停泊外，也有不少小艇穿梭維多利亞港兩岸和在港內停泊的遠洋輪船，提供運送貨物和人員等接駁服務。每當颱風吹襲香港時，漁船和小艇往往是受災最嚴重的一群。其中一次最為慘烈的風災發生在一九零六年，估計颱風引致多達一萬人喪生，絕大部分在海上。近半個世紀隨著社會轉變和基礎建設的改善，在漁船和小艇居住的人都已移居岸上，以船隻為生的人數大幅減少了，而船主和船員亦會在颱風時把船隻停泊在避風塘，因此近年颱風造成的海上傷亡已大為降低。無論如何，颱風時船隻能夠及時避風仍然是防災減災中最重要的其中一環。

記載中影響維多利亞港最嚴重的風暴潮可能是一八七四年史稱「甲戌風災」的颱風所造成。據報當時鶴園村、馬頭圍村、土瓜灣村、馬頭角村和馬頭涌村所有房屋被毀，情形可能就像二零一一年的海嘯沖毀日本東北沿岸地區的模樣；同時中環也遭受水浸，水深數英尺。

一九三七年的颱風在香港造成另外一次最為慘烈的風災，為吐露港帶來記載中破壞該區最嚴重的風暴潮，潮水沖毀了九廣鐵路沙田至大埔段的一截路軌，摧毀了大埔墟百分之八十的房屋，並在大埔、沙頭角等地區造成三百多人死亡，有目擊者形容潮水湧上岸上時高達五至七英尺。在維多利亞港，海水湧上尖沙咀彌敦道，不少市民在街上撈取漁獲。

颱風「溫黛」（Wanda）於一九六二年吹襲香港，維多利亞港和吐露港都錄得第二次世界大戰之後最高的水位，也是有自動驗潮記錄以來最高的水位。當時的風暴潮在沙田淹死了百多人，是戰後最嚴重的海水淹浸事件。一九七九年颱風「荷貝」（Hope）吹襲香港時的風暴潮也很高，但不高於堤岸，可是海水從大埔林村河口湧入沿河溯上，奪去三人性命。颱風「愛倫」（Ellen）於一九八三年吹襲香港時，美孚新村曾出現水浸，但風暴潮沒有造成傷亡。

一九八零年代以後，正面吹襲香港的颱風數目不多，嚴重風暴潮也因此較少出現。二零零八年颱風「黑格比」（Hagupit）在香港西南偏南掠過，距離香港有一百八十公里之遙，但其風暴潮仍為維多利亞港帶來「溫黛」以來最高的水位。風暴潮在大澳造成水浸，有居民需要緊急撤離；大浪和潮水也衝擊長洲東灣，侵蝕了一排臨海房屋的地基，造成地台下陷（見附圖）。假如「黑格比」的移動路徑更靠近香港，其引起的風暴潮將會更高，或會造成可比擬二零零五年颶風「卡特里娜」（Katrina）的風暴潮對美國新奧爾良市所造成的破壞。

進入二十一世紀，人造溫室氣體引致的全球暖化仍在不斷惡化。二零一二年七月，美國太空總署的衛星首次觀測到格陵蘭冰原差不多整個冰面都顯示融化現象，比往年夏天只有稍多於一半面積的冰面融化更為廣泛。地球暖化導致全球平均海平面上升，將會加劇風暴潮的影響，令颱風吹襲時更容易出現海水氾濫並且水位更高。到了二一零零年，類似颱風「黑格比」引致的風暴潮可能會頻密出現，更不能排除重現猶如一九三七年或一八七四年的特大風暴潮。

相比百多年前，香港臨海已少有容易受海水推倒的舊式房屋或寮屋，整條村落被夷平的情況也許不會再出現，可是地面設施和地面以下的基建例如鐵路和隧道等仍可能成為海水氾濫的災區。二零一二年十月颶風「桑迪」（Sandy）吹襲美國東岸地區，風暴潮引致紐約市地鐵水浸，發電廠因被水淹浸而發生火災，全市因此而癱瘓，市民生活大受影響。

二零零八年颱風「黑格比」引起的風暴潮在長洲東灣侵蝕了臨海房屋的地基（筆者攝）

「黑格比」、「卡特里娜」和「桑迪」所造成的風暴潮以及格陵蘭融冰可能都是警號，告訴我們風暴潮對現代社會仍會構成威脅，同時全球暖化會令這威脅日益增加。故此對應風暴潮的減災防災措施不能鬆懈，長遠而言香港可能有需要視乎實際情況提升海港防護建設，才能真正趨吉避凶，免受海水氾濫的危險。

細數風雲 Weather and Records

Hong Kong Weather Reflections of an Old Timer

華德斯博士
Dr. Dan Waters

已經九十多歲的華德斯博士是教育家及香港歷史學家，上世紀五十年代從英國移居香港，服務於政府。他對香港文化保育貢獻良多，於1998年獲頒銅紫荊星章 (Bronze Bauhinia Star)。現時是皇家亞洲學會香港分會榮譽會員；他不但活躍於電台節目，亦是涉獵題材廣泛的作家。他對香港的天氣、民生、民情，如數家珍。這位英倫紳士愛上這裡四季，扎根香港，可堪稱我們的活字典。

'This is the weather the cuckoo likes, and so do I.'

——***Thomas Hardy***

In the autumn of 1954, my future Hong Kong boss drove into my yard in England. He had decided to look me up and give me a briefing.

'There's water rationing in Hong Kong!' the late SJG Burt exclaimed. When I told him I had served in the legendary British Eighth Army in the deserts of North Africa in World War Two, it seemed to reassure him. He continued: 'We have a bad typhoon every seven years'. My only defence was that while I had not personally experienced any of the 'Great Winds of southern Europe', such as the *Bora* in the Adriatic, the *Mistral* in the south of France, the *Sirocco* in southern Europe or the *Foehn* on the slopes of the Alps, I had lain in bed and wondered if the roof would stay on in a good old English north-easterly gale.

The conversation with Sydney Burt reminded me of the saying by Samuel Johnson: 'When two Englishmen meet their first talk is of the weather'! It gives a lead in to other subjects.

The sea journey from England to sub-tropical Hong Kong, for my family and me, took 31 days. With largely rural conditions still existing in the New Territories and over the border, in China, I was immediately struck by the clarity of the winter atmosphere. It seemed from North Point you could almost reach out and touch the Kowloon Foothills. A few years later, on 16 January 1959, a record was set with a relative humidity of only 10 per cent. The conditions then contrasted markedly with the horrid pollution we know today, especially in places like Causeway Bay, Central District and Mong Kok.

In the 1950s there was little air-conditioning. In Statue Square Queen's Building (where the Mandarin Oriental Hotel now stands) and Prince's Building were two lovely old colonial style structures with high ceilings and balconies, and they were designed so a 'through draught' kept the buildings relatively cool in summer. If a building faced south the breeze from the south-west monsoon helped to keep it cool in the summer and it was protected from the cold of the north-east monsoon in the winter.

Similarly, there were the Chartered Bank of India, Australia and China (as it was then called), the Supreme Court and the old Hong Kong Club. None of these had air-conditioning. The only fully air-conditioned building in Statue Square, in those days, was the third Hong Kong and Shanghai Bank (now HSBC) Headquarters which was completed in 1935.

Old Prince's Building (Courtesy of Information Services Department)

The splendid old Prince's Building was completed in 1904 and demolished in 1965. It was replaced by the present air-conditioned Prince's Building. Colonial style buildings depended on high ceilings, wide verandahs and a through current of air, if possible catching the south-west monsoon. The Chinese saying has it that, 'Even with a thousand taels of gold it is difficult to buy a building facing south' (千金難買向南樓).

Statue Square in the early 1960s. (Courtesy of FormAsia Books)

The picture of Statue Square was taken in the early 1960s. It shows the Hong Kong Bank, completed in 1935, which was the first air-conditioned building in the territory, way ahead of its time. Alongside is the Chartered Bank of India, Australia and China, completed in 1957 (the previous building had no air-conditioning). One of the colonial style buildings is Prince's building and the other was the Supreme Court which was officially opened in 1912. Later, it became the Legislative Council Chambers. The building still stands today.

As government servants, we 'went into whites' on or about 1 May, and most of us wore shorts, open-necked short-sleeve shirts and knee-length socks. For civil servants, except for black shoes, everything was white. Our attention was sometimes drawn to the Chinese saying, 未食五月粽，寒衣唔好入籠, meaning, 'Do not store your winter clothing until you have eaten "Fifth Moon (Dragon Boat) Dumplings".' Incidentally, this is similar to the old English saying, 'Don't cast a clout till May be out'.

On the 1st November, or thereabouts, we changed back into winter clothes.

Hong Kong in the Nineteen-Sixties

The 1960s has sometimes been described as, 'The One Damn Thing After Another Decade'. There was the cholera outbreak in 1961; the runs on the Hang Seng and the Kwong On Banks in 1965; and the 1966 and the 1967 Riots. It was also an eventful decade as far as the weather went.

Typhoon Wanda, which struck on 1 September 1962, was the last devastating typhoon from which lessons were learned on how to batten down. Over in Kowloon I recall our concrete–framed, multi-storey building swaying. I beavered away mopping up water driven in around the edges of windows. Objects, 'flying in the wind', frequently broke glass in windows of neighbouring apartments. But once a bad storm gets 'inside a building' you are in deep trouble.

Severe flooding, as the 'eye' of Wanda passed over the Colony, coincided with high tide. But fortunately due warning, particularly regarding Tolo Harbour, was given, unlike with the

1937 Typhoon which was one of Hong Kong's worst typhoons on record. On that occasion it was estimated 11,000 souls perished. Hong Kong's population at the time was slightly less than one million so somewhere in the region of one per cent perished in that storm. They were mostly boat-people. This figure is appreciably greater than the eight-and-a-half thousand or so in the Allied Army, the Japanese Army and civilians who were killed or died of wounds in the brutal attack by the Japanese on Hong Kong in December 1941.

The death toll from Wanda was 130[1], with an estimated 2,000 craft sunk or damaged. In addition to the death and destruction in September 1962, there was a direct effect on the Royal Observatory. A 154 knot gust (*From Time Ball To Atomic Clock*, by Anthony Dyson) wrecked the weather radar at Tate's Cairn. In today's language this amounts to 284 km/hour.

The 1906 Typhoon was also extremely severe. With a population then of approximately 320,000 it has been estimated there were 10,000 fatalities amounting to something like three per cent of the population. Anglican Bishop Hoare had gone boating near Castle Peak with eight young curates when the storm blew up. Their small craft was driven on to rocks and only two curates survived. Today, there is a monument to Bishop Hoare in the grounds of Bishop's House. During the same storm five Petty Offices from the French Navy torpedo ship 'La Fronde' lost their lives while helping the local population. A monument

1 The death toll from Wanda was subsequently estimated to be 183 by Ho Pui-yin in "Weathering the Storm: Hong Kong Observatory and Social Development".

was erected in their memory at the junction of Gascoigne and Jordan Roads. To alleviate traffic congestion the monument was moved into the Hong Kong Cemetery (the old Colonial Cemetery) in Happy Valley in the late 1960s.

Following on from Typhoon Wanda, in 1962, 1964 was to become known as the ‘Year of Gales’. Five typhoons occurred in the one year, while another four typhoons passed close enough to cause strong winds and to disrupt shipping. The Observatory tracked a total of 44 storms in that year.

Although I am not able to record here every tropical cyclone in recent decades, few severe tropical typhoons have approached Hong Kong twice as did Agnes from 24 to 30 July 1978. Although not particularly powerful, it was a wet storm bringing 519 mm of rain.

Another severe typhoon, Ellen, struck on the 8 and 9 of September, 1983. This caused havoc among shipping and destroyed much of Hong Kong’s vegetation. There were 22 dead or missing, about 400 ships sunk, driven ashore or damaged and widespread damage elsewhere.

In the 80 years between 1884 and 1963 some 100 typhoons, accompanied by flooding and landslides, vented their wrath on Hong Kong. That is a little more than one tropical storm a year. Yet how is it people today can have lived in Hong Kong for the past 30 years without ever having experienced a really bad typhoon? One can only ponder why the weather pattern seems to have changed?

Water supply

Rainfall diminished in the wake of Wanda and Hong Kong's worst drought in history commenced in the autumn of 1962. The following year, 1963, was on average the hottest, sunniest, and least humid year since records began in 1884. Water shortage was the main topic of conversation for most of the year. The Chinese saying, 打風不成三日雨 , means, 'if a typhoon does not strike directly it will bring three days of rain'. Such a typhoon would have been welcomed in 1963.

I felt sorry for the folk in resettlement estates where there were long queues at standpipes. However for most of us the water was turned on for only four hours once every four days. The Governor, Sir Robert Brown Black, insisted the same restrictions also apply to government house. Although wells in the urban areas, long disused, were reopened and water was shipped in by tanker, the additional amount obtained was obviously limited. Sheet-metal workers did a roaring trade making water containers for storage. That was before the introduction of plastic water containers a few years later. In 1963 people even stole water and priests and clerics of all denominations prayed for rain.

The night the water was turned on children were the first to bathe; then mother, using the same water; followed by father who was the grubbiest. But the water remaining was too valuable to waste and was used for scrubbing the floor and finally for watering the plants. There were no 'damp (hand) towels' in restaurants, plastic table cloths were used, and barbers did not shampoo hair. Of course swimming pools were closed.

Water was turned on in different districts at different times and on different days. A small advertisement appeared in the English press:

> 'Gentleman living in Mid-Levels with water supply on Monday, seeks lady living in Tsim Sha Tsui with water supply on Tuesday. Purpose: sharing bath water!'

There was also a severe water shortage in 1967, when, for a period, the rationing was again four hours of water once every four days. But the drought was not so prolonged nor so severe as in 1963. In the mid 1960s Hong Kong started to receive water piped in from the Dong Jiang (East River) in China and, later, Plover Cove Reservoir and High Island Reservoir were constructed. A desalination plant was built out at Castle Peak but this was little used and proved to be something of a white elephant.

Although the 1960s was a dry decade, the 12 June 1966, brought a rainstorm with 157 mm of rain falling on Aberdeen between 6:30 a.m. and 7:30 a.m. and, in the 24 hours to noon on 12 June, 401 mm was recorded with floods and landslides killing more than 60 people. I was reading the newspaper early in the morning in my flat on King's Park Rise. After it started to rain, the intensity just seemed to keep on increasing. I don't recall having seen it rain like that since.

Nevertheless, the Hong Kong Observatory gives the following 'rainfall records': Maximum hourly, 145.5 mm, on 7 June 2008: Maximum daily, 534.1 mm, on 19 July 1926: and Maximum monthly, 1346.1 mm, in June 2008.

Cold spells

Having lived in sub-tropical Hong Kong since the mid-1950s, the lowest temperature I recall was about five degrees. It must have been colder in the good old days of the 19th century. Colonial style buildings had open fireplaces and chimney stacks at that time.

The former Kowloon British School (Courtesy of KY Shum)

There was extremely cold weather at times during the 19th century and the lowest temperature on record was 0.0 degrees Celsius taken on 18 January 1893 at the Hong Kong

Observatory. Colonial buildings were often constructed with open fireplaces for burning solid fuel. This photograph shows the former Kowloon British School, officially opened in 1902 at 136 Nathan Road, Kowloon. The building is now occupied by the Antiquities and Monuments Office. The chimney stack has two chimney pots and two flues to discharge the smoke from the fireplaces below.

In that splendid book by GAC Herklots, *The Hong Kong Countryside Throughout the Seasons*, first published in 1951 but long out of print, a temperature of 32 degrees Fahrenheit (0.0 Celsius) was recorded on 18 January 1893, 103 feet above sea level at the Royal Observatory in Kowloon. Herklots mentions an icicle on Mount Kellet between 15 and 30 cm long.

During the same cold spell, which lasted several days, after it had rained during the night, two members of the legal profession were spotted (illegally) making a long 'ice-slide,' just as I used to do in England in my youth. At the same time the Hong Kong hills were covered with hoar frost. On information supplied by the Royal Observatory the lowest temperature ever recorded was 0.0 degrees. Of course colder temperatures have been recorded on high ground, such as on Tai Mo Shan or elsewhere in the New Territories.

So, the cold is not really a problem in Hong Kong where we have our share of winter sunshine. Nevertheless February can bring a nasty, damp cold. On the 24 February, 2012, as I write this, the humidity is 100 per cent.

I remember shortly after I arrived in the British Crown Colony, in the winter of 1954-55, sitting in the unheated staff room of the college where I taught. A Chinese colleague asked what I had done over the weekend. I told him I had been swimming at Repulse Bay. He looked bewildered as he stood there in his overcoat. ‘Chinese don’t like heaters', he proceeded to inform me by way of reply. ‘They make the air too dry. If it’s cold we put on an extra layer of clothing.’

I must admit that, although I went swimming during the first winter when I arrived in Hong Kong, I have not swum in the winter since.

Hot weather

So much for the cold weather. But what about summer? The highest temperature of 36.1 degrees Celsius was recorded on both 19 August 1900 and again on the 18 August 1990. But, believe it or not, higher temperatures have been recorded in England! In Faversham in Kent, on 10 August 2003, a temperature of 38.5 degrees Celsius was recorded. But, compared to world-wide temperatures these are nothing really. I recall in the summer of 1943, in Tripoli in Libya, after the Desert War was over and we as soldiers were waiting to embark for the invasion at Salerno, in Italy in September, the mid-day temperatures were in the mid 40s Celsius.

When newly recruited expatriates came to Hong Kong, in early post-war years, we came by ship, and, as civil servants, we served four-year tours. Some well-meaning old timers used to tell newcomers that, with no air-conditioning, the ‘third summer’ invariably seemed the worst. Expatriate wives appeared to suffer more than their husbands from being ‘under the weather' as they looked forward to home leave, to 'get out of the heat'.

But is the Hong Kong weather all that bad? Life expectancy at birth here is 78.4 years for males - just 1.8 years below Swiss men who are in the top position. Yet life expectancy is 86.7 years for females which is the world's record Hong Kong having overtaken Japan. We Hongkongers now live, on average, one-third longer than in 1950. The climatic conditions must be a contributing factor. There are many of us in Hong Kong who have reached our nineties or are even older.

As a child in England I looked forward to the first snowfall of the winter and I enjoyed hearing my father talk about the 'Great Cold', in 1860. On that occasion a whole ox was roasted on the River Thames, in London, although how this was done without melting the ice has always been a mystery to me.

Many decades later, I have chosen to stay in Hong Kong after retirement from Government service and one of the reasons is that, in spite of the present day heavy pollution, I prefer the weather here to the English weather. Even today I live at home without air-conditioning, although my wife has her air-conditioned room in which she spends much of her time. For my part I am more contented to be in touch with nature and the 'seasonal changes' rather than living in an artificial atmosphere.

Historical Weather Observations in Hong Kong

呂永康
Lui Wing-hong

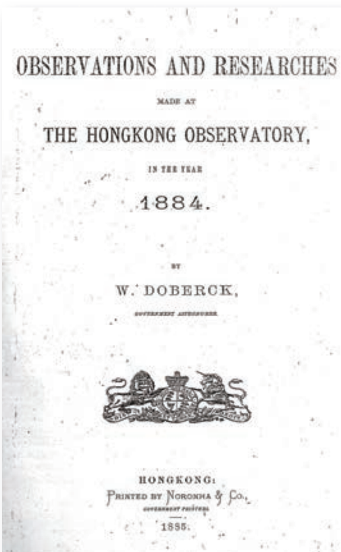
總學術主任呂永康，加入了天文台工作超過三十年，經歷了天文台不少的變化，本文記述了天文台自一八八四年起出版有關氣象觀測的刊物，及與氣象觀測有關的歷史進程。根據記載，雖然早期天文台主要在尖沙咀總部作天氣觀測，而香港其地點所設立的觀測台站不多，但當時出版的觀測記錄資料頗為豐富，更有包括東南亞地區的資料。文中亦敘述了一些觀測背景的變化，例如觀測數據所採用的單位及地點的轉變。本文亦介紹了天文台在日常業務中所收集到的船舶天氣報告。在沒有現代設施（例如雷達及氣象衛星）的時期，這些報告雖然相當有限，但對當時天文台的天氣預警服務已是非常重要。一九零六年九月為香港帶來重大傷亡的颱風正好帶出了這個重點。除了歷史價值以外，這些歷史氣象資料對研究氣候變化的工作亦是不可或缺的。

With the increasing concern on climate change, researchers have been studying the past changes in the weather conditions throughout the world. There are not too many historical weather observations in southeast Asia in the past century or so. The Hong Kong Observatory was established in 1883 and started making comprehensive weather observations at its headquarters in Tsim Sha Tsui, Kowloon since 1 January 1884. These historical records constitute a valuable source of information for the study of climate change in the region. Before 1884, the Hong Kong government had begun to make weather observations, but no unified approach was adopted and the data collected are of reference value only[1]. In fact, very few of these weather records before 1884 exist today. In addition to weather observations in Hong Kong, the Observatory had also collected weather observations made by ships over the seas in the vicinity of Hong Kong. Details on these weather observations are provided in the following paragraphs.

Starting from January 1884, observations were made on pressure, temperature, wind direction and speed, cloud type, cloud amount, direction of cloud motion, rainfall and sunshine duration at the Hong Kong Observatory's Headquarters[2]. Observations for selected hours were made at first and it was not until 1 January 1916 that hourly observations of the main weather elements round the clock commenced. These observations, as frequent as hourly, were published regularly although the title of the publication had changed several times over the years. For example, the first publication of such a series was known as "Observations and researches made at the Hong Kong Observatory in the year 1884" (Figure 1). These publications were later grouped under the series "Meteorological

Results Part I", covering the years 1884 – 1939 and 1947 – 1986. The publication was re-titled as "Surface observations in Hong Kong" for the years 1987 – 1992. During the Second World War, no weather observations for the Observatory were available from 1940 to 1946[3]. Full weather observations at the Observatory resumed in the latter half of 1946 after new equipment were obtained to replace those removed or damaged during the war. While most of the observations in the series "Meteorological Results Part I" were taken at the Observatory's Headquarters, observations at other locations in Hong Kong were also provided, such as Victoria Peak and Cape D'Aguilar in the 1880s, although the number of weather stations at those times was significantly less than that of today. From 1993 onwards, the Observatory publishes the daily and monthly meteorological summaries annually, presenting observations in a condensed format to improve readability.

Another source of historical weather observations kept at the Observatory was the China Coast Register. The Register was compiled daily based on weather information received from telegraph companies. Information now available at the Observatory includes those for the years 1897 – 1916, consisting of daily weather observations at the Observatory


OBSERVATIONS AND RESEARCHES

MADE AT

THE HONGKONG OBSERVATORY,

IN THE YEAR

1884.

BY

W. DOBERCK,

GOVERNMENT ASTRONOMER.

HONGKONG:

PRINTED BY NORONHA & CO.,

GOVERNMENT PRINTERS.

1885.

Figure 1 Cover of the first publication of the official weather observations for 1884 in Hong Kong.

Headquarters, Gap Rock (a small island some 40 km to the southwest of Hong Kong, now known as Wenweizhou Dao (蚊尾洲島)[4], as shown in Figures 2 and 3), Victoria Peak and cities in southeast Asia (known as the Far East then) such as Amoy (now known as Xiamen), Canton (now known as Guangzhou) and Manila. The Register provides a valuable record of daily observations of pressure, temperature, humidity, wind direction and speed as well as the weather conditions at those locations. Information from Gap Rock are particular useful in studying tropical cyclones, passing close to Hong Kong in those days. Brief description of the pressure distribution in the region and forecast for Hong Kong were also included in the Register. The records were integrated into the "Monthly Meteorological Bulletin" during the years 1917-1932 and listed on the Observatory's Weather Maps for the years 1934-1941.

Figure 2 A recent photograph of Wenweizhou Dao where a lighthouse operated by the Guangdong Maritime Safety Administration is located.

Figure 3 Map of the location of Gap Rock. (In 1985, the first automatic weather station jointly built by the Observatory and the Guangdong Meteorological Bureau commenced operation at Huangmao Zhou（黃茅洲）just to the northeast of Gap Rock.)

While studying these historical publications or records, we could easily see the changes in the history of meteorological observations in Hong Kong, such as the changes in the units of measurement of various weather parameters, the instruments employed and the monitoring stations. British units were mainly adopted in the measurements before the Second World War and metric units were gradually used after the war. For example, pressure and rainfall were provided in inches of mercury and inches respectively in the early publications and were later changed to millibar (hectoPascal) and millimeters respectively since 1947. Temperatures were provided in degrees Fahrenheit in the early days and changed to degrees Celsius since 1961. Due to the effect of urbanization around the

Observatory Headquarters, measurements of sunshine duration were moved to King's Park Meteorological Station with better exposure in 1961.

From records of observation made over land, we now turn to those over the sea. The Observatory started to collect ship weather reports as early as the 1890s. However, only limited records from that period exist today. These ship reports were plotted on the Observatory's historical weather maps starting from 1909[5]. Some of the reports were listed out on the back of the weather map or published in the Observatory's annual report. The parameters available in the ship's weather report normally included pressure, temperature, wind direction and speed as well as weather conditions, etc. Figure 4 shows an example of such a historical weather map. It is evident that there were not too many observations in the region at the time and the plotting of the weather observations was also slightly different from that of today. More comprehensive ship weather observations were available at the Observatory from 1949 onwards.

Apart from providing information on the historical weather events, we could also find the first tropical cyclone name adopted by the Observatory and published on its weather maps of 5 September 1952, known as Nona. These maps provide a very useful source of information for studying historical tropical cyclones in the northwestern Pacific.

During the early 20th century, facilities such as radar, satellite or aircraft observations and automatic weather stations were not yet available. Thus, land and ship weather observations, even though they were rather limited, were

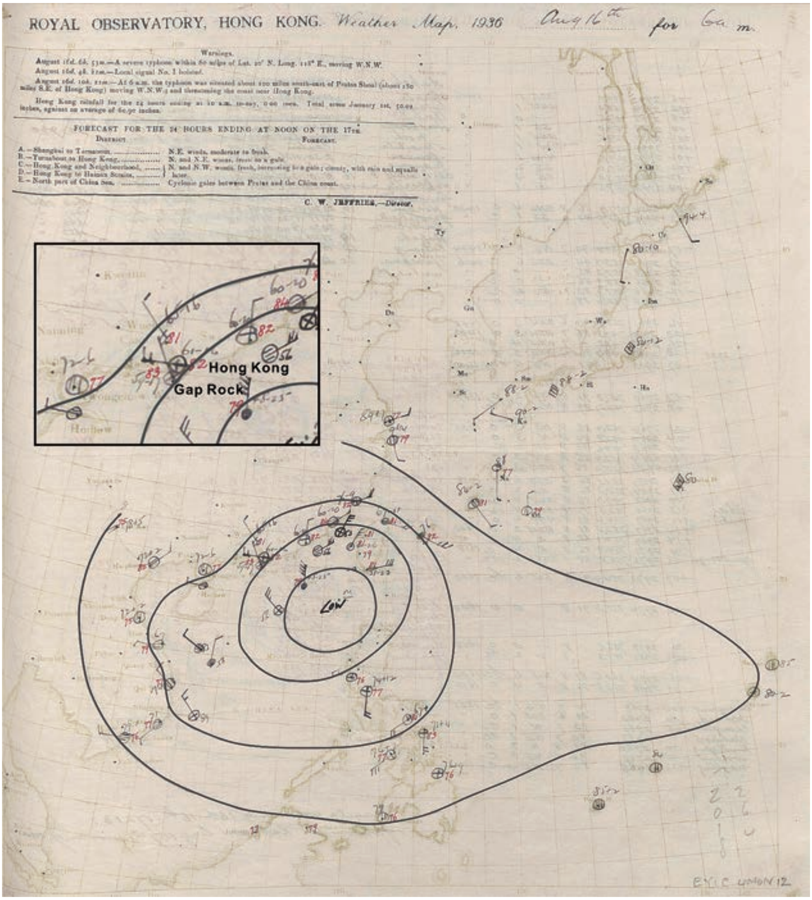


Figure 4 A historical weather chart prepared by the Observatory for 6 a.m. on 16 August 1936. The inset near the top left shows the blow-up area around Hong Kong, with the plotted observations for Hong Kong and Gap Rock shown.

already invaluable to the warning services provided by the Observatory, especially during the passage of tropical cyclones. The severe loss of life and damage incurred during the passage of a typhoon in September 1906 clearly demonstrated this fact. Very little weather information was received at the Observatory as the typhoon approached the territory. The sudden arrival of the typhoon resulted in more than 10,000 deaths in Hong Kong, and substantial property losses and damages amounting to millions of dollars at the time[6]. Dr. William Doberck, the then Director of the Hong Kong Observatory, made this remark in the Director's Report for 1906[7]: "Could earlier warning have been given it would doubtless have contributed to the saving of life and property as far as the boat population in the harbour is concerned".

As these historical records are invaluable to the studies of climate change, the Observatory strives to preserve its historical records of observations. The Observatory has also started converting these records into electronic form for ease of archival, processing and application. Similar efforts are being conducted in other parts of the world as well, such as a project on digitizing weather records from historical ship logbooks in the United States[8] to facilitate the studies on global climatic change.

References:

1. *Weathering the Storm, Ho Pui-yin, Hong Kong University Press*
2. *From Timeball to Atomic Clock, Anthony Dyson*
3. *Meteorological Results Part I, 1947*
4. *http://www.gdmsa.gov.cn/gzhbc/ShowArticle.asp?ArticleID=535*
5. *A century old weather map, Director's Blog of 17 November 2009 (http://www.hko.gov.hk/blog/en/archives/00000042.htm)*
6. *The Calamitous typhoon at Hong Kong 18th September, 1906*
7. *Director's Report for 1906, Hong Kong Observatory*
8. *Old ship logs fill in weather history of past 250 years (http://www.usatoday.com/weather/forecast/2010-11-26-oldweather26_ST_N.htm)*

"Hong Kong Had Turned to Ice" : Record of Lowest Temperature in January 1893

呂永康
Lui Wing-hong

本文從一個科學和歷史的角度，敘述了香港自有紀錄以來最低氣溫的個例。文中節錄了香港天文台的歷史氣象紀錄，並參考了當時的報章及刊物有關寒冷天氣的報導。可以看到，那一次寒冷天氣的過程對當時的民生有頗大的影響，而中國內地亦然。隨着全球暖化的影響，香港日後出現這樣寒冷天氣的情況或許較為罕有。但值得注意的是，雖然氣溫總括來說是將會進一步上升，但冬季時非常寒冷的低溫情況亦仍會間中出現。

Cold weather is not unusual in Hong Kong during winter, but the cold weather on 18 January 1893 should worth special attention as it set the record for the lowest temperature of 0°C recorded at the Hong Kong Observatory's Headquarters in Tsim Sha Tsui, since instrumental observations began in Hong Kong in 1884.

In Hong Kong, the Observatory uses the description term "cold" and "very cold" in its weather bulletins for temperatures in the range of "8 to 12°C" and "less than 8°C" respectively. The cold event of 18 January 1893 occurred amidst a spell of cold weather in the territory. The minimum temperatures were in the "cold" or "very cold" category for nine consecutive days from 14 to 22 January (Fig.1). It was also wet with rain and there was practically no sunshine during the onset of the cold spell (between 13 and 17 January, Table 1), with northerlies prevailing between 14 and 19 January. A closer look (Fig. 2) showed that the minimum temperature of 0.0°C occurred at around 7 a.m. on 18 January and temperatures were below 5°C throughout the previous day. The sun eventually came out on 18 January after the 0.0°C was reached and temperatures rose to a maximum of 7.7°C that day.

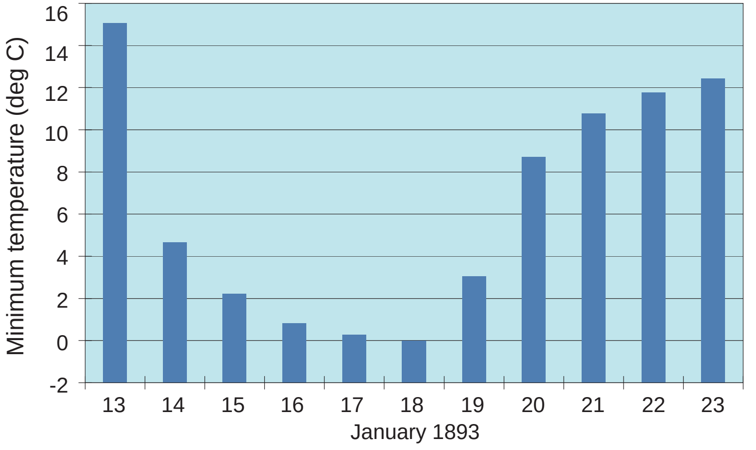


Fig. 1 Daily minimum temperatures recorded at the Hong Kong Observatory Headquarters during 13 - 23 January 1893

Table 1 A selection of meteorological parameters recorded at the Hong Kong Observatory Headquarters in January 1893

Date	Minimum temperature (°C)	Total Rainfall (mm)	Total Bright Sunshine (hours)
13	15.1	3.6	Nil
14	4.7	2.4	Nil
15	2.2	12.4	Nil
16	0.8	14.6	Nil
17	0.3	0.3	0.1
18	0.0	Nil	10.2
19	3.1	Nil	5.7
20	8.7	Nil	8.3
21	10.8	Nil	10.1
22	11.8	Nil	9.8
23	12.4	Nil	9.4

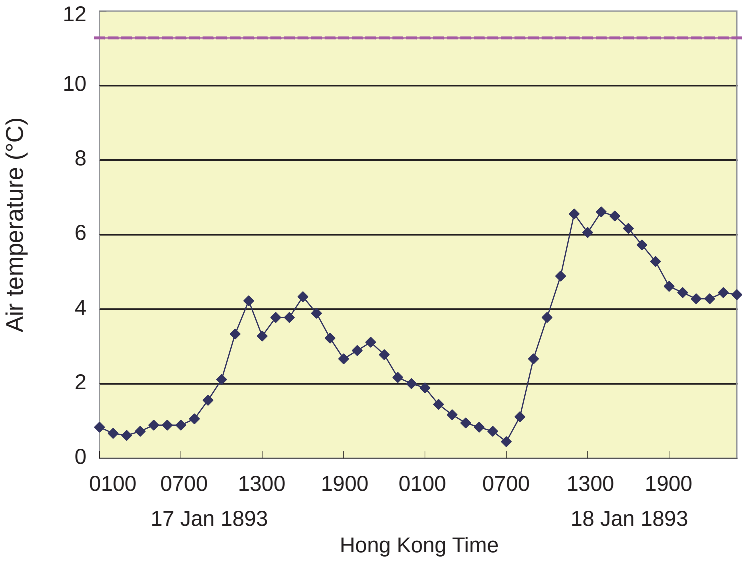


Fig. 2 Hourly air temperatures (blue) recorded at the Hong Kong Observatory on 17 – 18 January 1893. The lowest hourly temperature reading was 0.4°C recorded at 7 a.m. on 18 January. The minimum of 0.0°C should have occurred around this time. The mean minimum air temperature for January 1893 is shown in red.

The weather map for 17 January 1893 (Fig. 3), reconstructed based on the limited weather observations available, shows an intense anticyclone covered China, bringing temperatures in the range of 4 to 7°C to the coast of southern China.

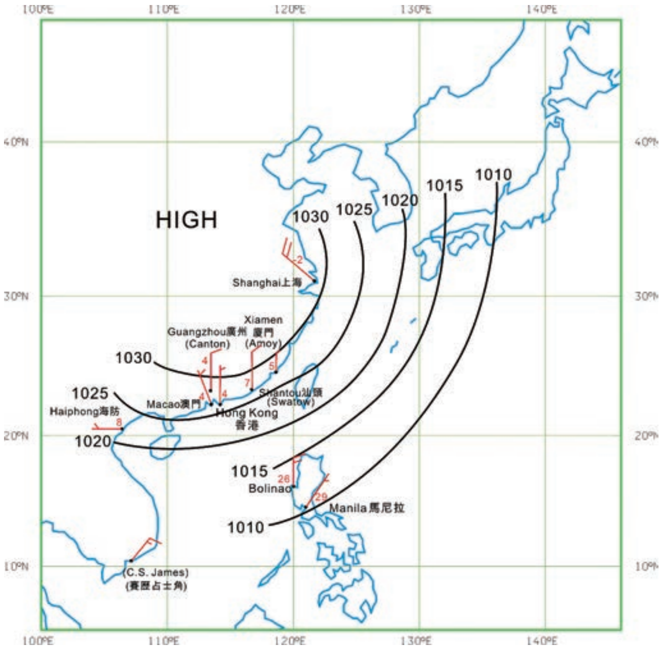


Fig. 3 Weather map for 4 p.m. on 17 January 1893, re-constructed based on information extracted from the China Coast Meteorological Register published by the Observatory. Shown alongside each station are the wind direction and speed and the temperature in degrees Celsius.

The China Mail of 17 January 1893 reported that "Peak residents speak of the accumulation of ice in the Hill (Victoria Peak) district as having largely increased, and in many parts of the roads were positively dangerous, their surface being covered with a coating of ice on which it was almost impossible to get a firm foothold". It also reported that the telegraph wires in the hill district "suffered greatly" with "ice upon the long stretches of wire". According to the newspaper, snow was reported in many places over China, such as Shanghai (上海), Taiyuan (太原), Kaifeng (開封), Tianjin (天津) and cities in Shangdong (山東) province during the past week or so. In an earlier Observatory's publication[1], it was recorded that "Hong Kong had turned to ice, and that description was no exaggeration. Icicles formed on the rigging of sailing ships in the harbour…". On the following day, China Mail reported slight improvement in the weather conditions and "The Peak roads cleared of ice last night, although the wind was as biting as ever".

Mr. Charles Ford, Superintendent, Botanical and Afforestation Department in the old days, submitted a special report [2] on the cold event to the Acting Colonial Secretary at the time. He reported that the temperature fell to a minimum of -0.6°C in the Botanical Gardens on 17 January. He also estimated that, based on private observers in the hill district, the temperature at the summit of Victoria Peak was in the region of -4°C. In another report for 1893[3], Mr. Ford remarked that "Within the Gardens the most regrettable losses by cold were many valuable orchids. Many inside houses were killed, and all the plants growing on a tree of Fiscus retusa were killed".

Mr. L. Gibbs wrote an article for the Hong Kong Naturalist [4] describing that "The rain froze as it fell and I well remember that by the time I reached Magazine Gap a heavy ulster I wore was frozen stiff in front of me".

The Medical Report of Shanghai[5] for the year ending 30 September 1893 also reported that the cold event was noticeable in China. Dr. Alexandar Jamieson pointed out that "The year 1893 began with great severity. Snow fell heavily, and from the middle to the end of the month snow storms occurred frequently along the entire coast, extending as far south as the tropic of Cancer". He also reported that the minimum temperature at Zikawei Observatory in Shanghai fell to -12°C, the lowest ever recorded there. A more recent Chinese publication on the history of meteorology in Shanghai, China[6] also reported that very cold weather affected Shanghai during the winter of 1892-1893 with temperatures of below -5°C being recorded for 17 days. It also confirmed that a minimum temperature of -12.1°C were recorded there. There was another report[7] by Mr. Tail, an expatriate gentleman in Hong Kong that the cold event in 1893 was historic in intensity. “It seems to be one of the only recorded instances anywhere, anytime, of freezing temperatures at sea level in the tropics”.

It should be noted that very cold weather was not uncommon in the early days of the Observatory. Table 2 shows occasions with minimum temperatures of 4.5°C or below recorded at the Observatory’s Headquarters since 1884. There were 26 of such occasions since 1884 with half of them before and half of them after the war years, but only three cases after 1970. The minimum temperature at the Observatory after the war years was 2.4°C, which was recorded on 11 February 1957. This was only about 2°C higher than the lowest minimum before the war years.

Table 2. Occasions with daily minimum temperature of 4.5°C or below recorded at the Hong Kong Observatory's Headquarters since 1884

Number	Rank	Minimum temperature (°C)	Date of record
1	1	0.0	1893.01.18
2	2	0.3	1893.01.17
3	3	0.8	1893.01.16
4	4	2.2	1893.01.15
5	5	2.4	1957.02.11
6	6	3.1	1893.01.19
7	6	3.1	1900.01.09
8	6	3.1	1955.01.11
9	9	3.6	1901.02.05
10	10	3.8	1917.01.09
11	10	3.8	1948.01.26
12	10	3.8	1957.02.10
13	10	3.8	1972.02.09
14	14	3.9	1901.02.04
15	14	3.9	1917.01.08
16	14	3.9	1956.01.09
17	17	4.0	1969.02.05
18	18	4.1	1916.01.04
19	18	4.1	1919.02.04
20	20	4.2	1957.02.12
21	20	4.2	1974.02.26
22	22	4.3	1925.02.01
23	22	4.3	1948.01.27
24	22	4.3	1952.02.19
25	22	4.3	1975.12.14
26	26	4.4	1952.02.18

With the rising temperature trend under global warming, minimum temperatures of such a low value had not recurred since the 1980s. Nevertheless, despite the general trend for global warming, we should pay attention to the low temperatures experienced in the past few winters, for example, minimum temperatures of 5.8°C and 7.2°C were recorded at the Observatory on 17 December 2010 and 12 January 2011 respectively, indicating that there would still be an occasional chance for rather low temperatures in winter. Nevertheless, the record of 0.0°C at the Hong Kong Observatory might continue to be an historical record for many years to come!

References:

1. *From TimeBall to Atomic Clock, Anthony Dyson, (pages 52-53)*
2. *Special report on the cold event to the Acting Colonial Secretary, 1893*
3. *Report of the Superintendent of the Botanical and Afforestation Department for 1893*
4. *The Hong Kong Frost of January 1893, L. Gibbs, The Hong Kong Naturalist, November 1931 (pages 318 -319)*
5. *Medical Reports for the year ended 30th September 1893, China Imperial Maritime Customs (pages 34-35)*
6. *上海氣象誌，上海社會科學院出版社，1997 (第 63 頁)*
7. *http://www.batgung.com/northeast-monsoon-hong-kong*

Broadcasting Tropical Cyclone Warnings in Hong Kong - a Historical Perspective

江君彥
Kong Kwan-yin

江君彥先生是美國國家海洋及大氣管理局水文預報中心的氣象學家。他年青時在香港居住，對天氣特別是颱風一直都很有興趣，可以算是早期的「天氣發燒友」。每當熱帶氣旋吹襲香港，江先生都不斷留意及收錄電台播出的熱帶氣旋警告。他移居美國後從事氣象專業，對香港天氣的關心未減，並繼續收錄電台播出的香港熱帶氣旋警告，並加上氣象衛星、雷達圖像等資料，製作短片在互聯網共享。他在文中特別分享了颱風愛倫襲港時的珍貴電台廣播錄音，及重温過去半個世紀電台播出這些重要信息的歷史。

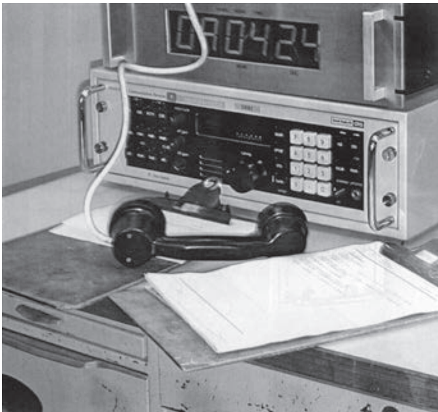
From 1961 up to 2010, an average of 6 tropical cyclones affect Hong Kong every year (Reference 1). Whenever a tropical cyclone brings gale force or stronger winds to Hong Kong, the Hong Kong Observatory would issue frequent tropical cyclone bulletins, typically once every hour, to warn the public of the imminent dangers of the approaching storm. Nowadays, the public can view these bulletins at the Observatory's web site through the Internet. However, it was not too long ago that the public could only rely on more traditional media outlets such as TV and radio stations for the latest tropical cyclone warnings issued by the Observatory. These broadcasts, which are known as "Typhoon Bulletins" (風暴消息), are made available every 15 minutes[1] on the two major Cantonese-speaking radio stations in Hong Kong.

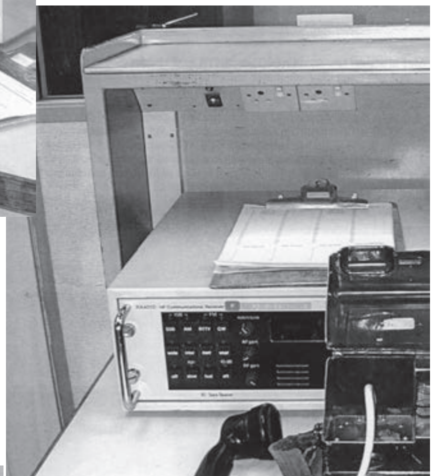
The two major Cantonese-speaking radio stations in Hong Kong, Radio Television Hong Kong (RTHK) and Commercial Radio Hong Kong (CRHK), now broadcast these tropical cyclone warnings in their own studios. However, from 1963 until 1999, the studio was actually located inside the Hong Kong Observatory headquarters in Tsim Sha Tsui. The Observatory's annual report for 1963-64 mentioned that "a direct broadcast in Chinese was made by Radio Hong Kong [now RTHK] from a booth at the Royal Observatory. The booth was connected by landline with the Continuity Room at Radio Hong Kong. A V.H.F. link was maintained at these times to avoid disruption of the

1 The tropical cyclone bulletins were broadcasted at exactly 15 minutes, 30 minutes, 45 minutes, and 58 minutes from each hour. The practice of broadcasting the last bulletin at 58 minutes of the hour was probably to accommodate the commercial messages of CRHK. As the joint broadcast efforts ended, RTHK began the practice of broadcasting the bulletins right on the hour since Severe Tropical Storm Goni in 2009.

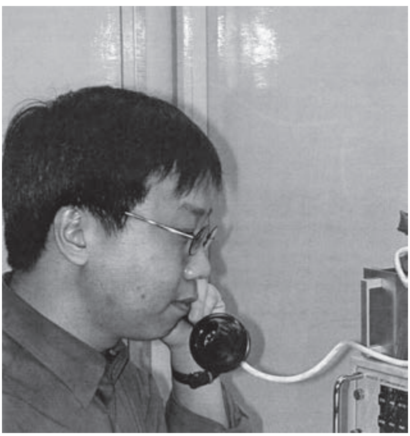
service due to failure of the landline". Back then, the Typhoon Bulletins were a joint effort of RTHK and CRHK. Each station would delegate staff members to be sent to the Observatory as soon as they were notified that the No. 8 signal would soon be hoisted. The team included some well-known broadcasters from both radio stations. These all male broadcasters would rush to the Observatory to station there round-the-clock and broadcast the Typhoon Bulletins directly received from the Observatory's Central Forecasting Office. Well-known voices including sports commentators and radio drama team members could be heard in these bulletins. These were just about the only instances where a voice of CRHK could be heard on RTHK and vice versa. As an example, radio recordings of tropical cyclone warnings during Typhoon Ellen in 1983 broadcast through RTHK have been posted on the Observatory web site (Reference 2) where Chan Sum (陳森) and Yeung Kwong-pui (楊廣培) were members in the CRHK drama team whereas Ben Lee (李學斌) and Tsang Wing-keung (曾永強) were in the RTHK drama team. The RTHK football commentator Ho Kam-kong (何鑑江) appeared during the No.8 Signal. The late RTHK broadcaster Chung Wai-ming (鍾偉明) was also heard in many of the Typhoon Bulletins in earlier years.

Over the years, radio stations in Hong Kong have worked closely with the Observatory on broadcasting tropical cyclone warnings to the public. These Typhoon Bulletins have survived the test of time over the decades and have become part of the collective memories of Hong Kong people who have experienced the wrath of historical strong typhoons first hand.





Broadcasting equipment located at the Observatory in the past.



HKO staff notifying radio station staff to come to the Observatory for the broadcast of Typhoon Bulletins.

References:

1. http://www.weather.gov.hk/informtc/tcStatTable4b.htm

2. http://www.weather.gov.hk/informtc/historical_tc/ellen_broadcast_uc.htm

細數風雲 Weather and Records

輻射監測與福島核事故

馬偉民
Ma Wai-man

Mr. WM Ma is a senior scientific officer of the Hong Kong Observatory, responsible for Emergency Preparedness and Assessment in radiation monitoring work. In this article, Mr. Ma looks back to the history of radiation monitoring work of the Observatory and shares his experience on how the Observatory's staff tackled the sudden event of the radiation incident in Fukushima, Japan in March 2011, in an effort to providing the most up-to-date information to the public. To him, team spirit and dedication of staff are the most memorable part of the incident.

天文台在輻射監測的工作早在上世紀六十年代初已經展開，當時國際社會處於冷戰高峰期，各強國進行多項的核武測試。儘管核武測試地點偏遠，但其產生的人工放射性核素亦隨風擴散至全球各地。輻射監測的結果對瞭解核武測試的影響有一定的作用。

八十年代中廣東省開始籌備建立大亞灣核電站，加上一九八六年四月前蘇聯徹爾諾貝爾核電廠發生了嚴重的核事故，大大引起了市民對核安全的關注。天文台亦在一九八七年大幅擴展其輻射監測的工作，開展「本底輻射監測計劃」和隨後的「環境輻射監測計劃」。計劃實施至今已有二十多年，監測結果顯示香港的環境輻射水平並沒有顯著變化。

天文台的輻射監測和評估科於九零年代初成立，輻射監測工作和覆蓋範圍進一步擴大，同時亦開始建立專業團隊，設立監測及評價中心，引入事故後果評價系統，發展輻射數據管理系統，進行核事故應急演習和培訓等等，以配合大亞灣應變計劃的執行。

二零一一年三月十一日日本以東的太平洋發生猛烈地震和海嘯，引致日本福島第一核電廠發生嚴重核事故。這核事故震驚全球，輻射污染成為世界各地的關注點。現時信息科技發達，不論實況或謠言均能快速地廣泛傳播，加上早期事態發展變化迅速，市民對其關注較徹爾諾貝爾核事故時有過之而無不及。要應對這局面需要爭分奪秒，刻不容緩。

碰上這從沒有預見的情況，天文台迅速動員，輻射監測和評估科的專業團隊首次空群而出，在其他同事支援下，二十四小時不停監測和分析日本方面的最新輻射數據，同時加強香港本地的環境輻射監測工作，包括增加空氣和其他樣本的採集和檢測，進

行額外的空中輻射巡測等等。此外，天文台每天運用大氣擴散模式，模擬輻射洩漏在未來兩三天的散佈情況，務求掌握事態最新發展，向各部門提供專業意見和支援。

福島核事故期間天文台同事不斷監測和分析日本的輻射數據

天文台聯同政府飛行服務隊在香港境內進行額外的空中輻射巡測

在核事故發生後的十數天，「輻射雨襲港」和「吃鹽防輻射」等謠言不時出現，市民心情和生活亦受到影響。天文台的專家每天均透過電台，電視台及其他渠道向市民詳細解釋香港的環境輻射水平和評估最新情況，以釋除公眾疑慮。許多市民透過電郵或直接打電話到天文台詢問輻射的影響，同事們不遺餘力地說明實際情況，讓市民安心。

天文台的相關軟件開發小組亦馬不停蹄，發生核事故後迅速製作並推出核事故監察特別網頁，將最新監測和模擬結果透過天文台網站公佈，方便市民獲得相關的最新信息。推出初期為保證輻射數據能不斷更新，負責系統維護的同事更曾一度整晚留守在監測及評價中心，檢測線路以確保數據傳送維持正常。

福島核事故在二零一一年五月開始穩定下來，天文台的輻射監測工作亦逐漸恢復正常。核事故期間我充分體驗應急情況團隊合作的重要性。有些同事甚至連續數星期每天都要處理額外的應急工作，其敬業樂業的精神十分可嘉。在辛勞的工作背後，收到市民電郵表示讚賞，就是對我們的最佳鼓勵。

日記一則

胡宏俊
Woo Wang-chun

Mr. WC Woo, scientific officer, recollects his unforgettable experience of tsunami training in Bangkok in 2009 as well as participation in the monitoring of possible local tsunami, following the Japanese earthquake event on 11 March 2011. Although the tsunami threat to Hong Kong was not that significant during the event, he and other HKO staff worked together to closely monitor the situation and took appropriate measures to alert the public.

一個平凡的星期五。雲中帶晴，不冷不熱，氣候宜人，卻因上星期染上了感冒而仍身感不適，吃了好幾天藥還沒有痊癒。幸而早前取得了今天的事假，而剛好本來要辦的事又給取消了，正好趁這天假期好好休息，服藥也能盡情一點，不用顧慮副作用。

也許是昨晚下重藥的結果，起床時已是日上三竿，卻還有點頭昏腦脹。看過報紙，吃過午飯，正打算多睡半場的時候，太座忽然來電，語帶慌張的告訴我日本發生了海嘯，問我要不要回天文台幫忙。那時，我還沒有意識到事態的嚴重，以為她又舊聞當新聞，告訴我兩天前在日本發生的輕微海嘯，於是安慰她說，是有海嘯，但兩天前已處理了。她緊張的回應，不是啊！是剛剛發生的，電視新聞都報導了。這時我才心感不妙，掛上電話後立即查看手機，果然，已收到太平洋海嘯警報中心發出的短信，網上新聞也作出了相關的簡報。通過電話與同事了解情況後，我便立即趕回天文台協助處理。

一般人得悉日本大海嘯這消息，可能會感到震驚，也許會致電旅居日本的親友慰問一下。然而，天文台的同事在震驚未完之際，便要即時處理價值百萬的問題：這次海嘯會影響香港嗎？我們是否需要發出海嘯警告或海嘯報告？我們應該為公眾提供什麼訊息呢？

香港位處中國東南沿岸，南面是南中國海。從風險而言，在菲律賓以西的馬尼拉海溝是最有可能產生顯著海嘯而影響香港的地區。然而，南中國海通過呂宋海峽與太平洋相連，香港也有可能受到太平洋的海嘯影響。這種情況在過去六十年出現過四次，唯錄得的海嘯都不過三十厘米[1]。雖說過去從未發生，但若某天

1 1960 年 5 月 23 日智利發生有儀器記錄以來規模最大的地震，強度達 9.5 級。該地震引發跨越太平洋的海嘯，在遠至夏威夷、日本和菲律賓等地造成傷亡和破壞。當時，香港錄得三十厘米水位異常。

太平洋出現海嘯，到達香港時仍達半米或以上的話，其引致的海水上升和急流也有可能在香港境內造成破壞。因此，在香港海嘯警報系統中，除特別注重的南海地震外，亦包括了對太平洋地震的應對。

回到天文台後，同事們已發出地震報告，並開展了海嘯標準作業程序訂下的工作，包括監察海嘯波從地震源頭擴散的情況、閱覽太平洋海嘯警報中心和日本氣象廳發出的海嘯警報和地震訊息、分析驗潮站和分佈在太平洋上的海嘯浮標的數據、以及利用海嘯走時模式推算海嘯抵港的時間等等。經討論後，我們認為雖然顯著海嘯影響香港的機會不大，但也有可能在香港出現不到半米的海嘯，而且事件已廣受公眾關注，於是按程序發出海嘯報告，並繼續緊密監察，根據當時情況適時更新報告內容。

颱風的來臨通常會有一兩天的準備，即使引致暴雨的天氣形勢也往往有跡可尋，地震和海嘯卻在任何時候都可以發生，不會有任何預警，因此，事前的準備功夫尤其重要，標準作業程序和警報範本都必須預先準備妥當，然後在事故來臨時按「劇情」發展，隨機應變。

三年前，有幸得到天文台的提名，參加聯合國教科文組織海洋學委員會在曼谷舉辦的一週課程，學習如何制定和執行海嘯標準程序。課程中，除了學到有關海嘯的技術知識和參與演習外，更有機會與其他國家的海嘯工作者交換經驗。雖然海嘯可以造成極大災害，但發生機會卻很低，各國負責運作海嘯警告的人員不多，能與他們分享心得和聽取他們的寶貴經驗，實在是難能可貴的事情。學員間也爭取時間，確保將海嘯專家傳授的知識和技術帶到自己的機構內。無論是與馬來西亞同學一同試行海嘯走時模式的實驗、與內地和新加坡同學於晚飯時就海嘯警告運作細節上

的交流、或與汶萊和印尼同學在早餐時就地震站建設的討論，都是令人難忘的體驗。

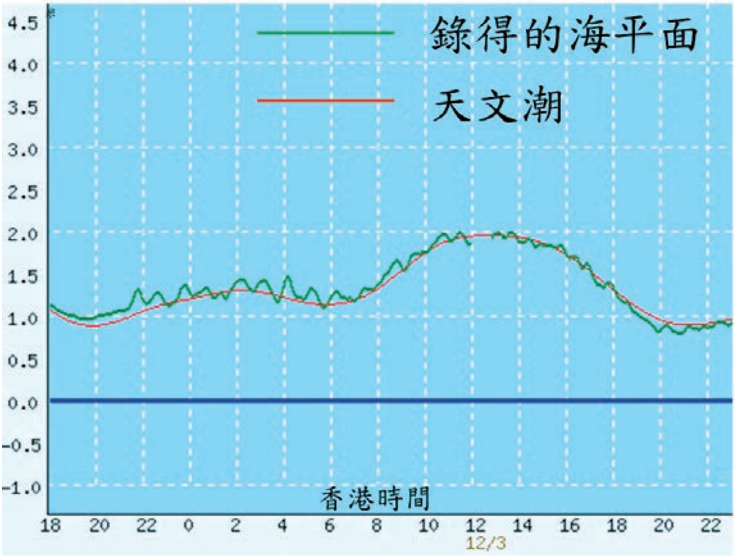
筆者（右三）在海洋學委員會課程中參與桌上演習的情況。

課程期間，剛巧遇上「五一二」四川地震，媒體傳來地震造成的重大災情，令人神傷。我在課程末的分享會上表示：生靈塗炭，更使人感到任重道遠。雖然世上沒有能定時定點準確預報地震的技術，但我們卻能在地震發生後，利用海嘯數值模式、海嘯浮標和驗潮站等工具，推算海嘯抵達的時間和高度。及時和清晰的海嘯警告可以減少人命和財產損失，因此，我們都肩負著以科學保障公眾安全的重任。

過去數年間，天文台地震部的工作很大部分也是為了監測及應對地震和海嘯：海嘯數值模式的應用、海嘯標準作業程序的檢討和更新、以及海嘯警告和海嘯報告範本的編製，固然與海嘯直接有關。即使是香港寶珊寬頻地震站的建立和為其加入全球地震台網的申請，也是為了加強對南海地震的監測。而開發自動地震資訊系統的其中一項主要目標，亦是為了監測可能產生海嘯的地震。

日本三一一海嘯傳播至香港需約七個多小時。雖然在日本的海嘯高度驚人，在太平洋一些島嶼也錄得兩三米高的海嘯，但海嘯波具方向性，在琉球群島、台灣和菲律賓等地的海嘯高度相對較低。因此，在收到當地的報告後，我們已頗有信心在香港的海嘯高度不會超過半米，沒有需要以海嘯警告取代海嘯報告。

直到晚上九時許，海嘯「準時」到達。我們看著橫瀾島、石壁、鰂魚涌等驗潮站相繼出現水位變化，幅度在二十厘米左右，屬預期之內，始能放下心頭大石，鬆一口氣。一個多小時後，確定了隨後的海嘯波也沒有產生更大的水位波幅，我們方才發出最後海嘯報告，解除戒備。



3 月 11 日在鰂魚涌錄得的水位異常。

塵埃落定，我們眾人圍在一起觀看電視新聞報道，屏幕上盡是海嘯蹂躪日本的駭人影像，心裡感到極度不安，唯有默默向當地災民送上至誠的祝福。大自然的巨大威力、人類的渺小，都在這場海嘯災難中表露無遺。

在回家的路途中，的士司機急忙為我報導海嘯的最新情況，還繪形繪聲的告訴我，海嘯就像一幅巨大水牆橫掃太平洋，恐怕把不知多少條船打沉了。我沒好氣的告訴他，在太平洋上的海嘯不高，遠洋輪船才不會被海嘯吞噬，只有在近岸淺水的地方，海嘯才會令海平面急漲而造成災害。說著書本知識，方才想起整個下午都沒吃過藥，感冒卻在緊張透頂的工作中消失了。

追蹤熱帶風暴杜蘇芮

林鄺泗蓮
Lam Kwong Si-lin, Hilda

Mrs. Hilda Lam, Assistant Director of the Observatory, gives an account of the monitoring and the passage of a rather special and untimely storm, Tropical Storm Doksuri, which threatened the territory just prior to the 15th Anniversary of the establishment of the Hong Kong Special Administrative Region at the end of June 2012. Doksuri is one of the many storms with which she has close encounter while working in the forecasting office. In her last typhoon season after over 30 years of service at the Observatory, she is appreciative of the opportunity of leading the forecast and warning operations in respect of Doksuri, and being the first woman meteorologist, as the Acting Director, to personally sign off the Tropical Cyclone Warning Signal No. 8 in the 130-year history of the Observatory.

　　進入 2012 年 6 月下旬，數值模式已預測將會有一個熱帶氣旋或低壓區於 6 月 30 日前後，移近並非常接近香港。屆時香港回歸 15 周年，有多項慶祝活動包括國家主席到訪，解放軍跳傘表演等，另外新舊政府交接，立法會日以繼夜審批議案。由於熱帶氣旋的發展，可能影響社會各界的活動，為此，天文台的預報隊伍，特別加倍留意，迎接準確預報熱帶氣旋的挑戰。

6 月 28 日，天文台同事在維多利亞公園進行高空氣象觀測，為支援解放軍進行跳傘表演作出準備

　　熱帶低氣壓杜蘇芮於 6 月 26 日在西北太平洋上形成向西北偏西方移動，翌日增強為熱帶風暴，並於 28 日橫過呂宋海峽，晚上進入南海，以西北偏西的路徑及相當快的速度(每小時 27 公里)移向珠江口一帶。

杜蘇芮有兩個特點，第一是移動速度快，第二是強度偏弱。在整個生命過程，都只是維持在熱帶風暴的級數(即中心風力為每小時63-87公里)，而主要原因是由於它處於一個垂直風切變較大（即高空風向或風速與低層風向或風速出現明顯差別，不利熱帶氣旋的發展）的大氣情況。在衛星雲圖上，杜蘇芮海平面中心往往顯露於其相關的對流雲團以外，相距可達100公里。正因如此，利用衛星圖像上的雲團中心，尤其是在晚上來訂定杜蘇芮的海平面中心位置，幾乎是不可能。同樣地，雷達圖像上，完全找不到一般環繞熱帶氣旋的螺旋雨帶。因此，在追蹤杜蘇芮的位置及評估其強度方面，預報員彷彿回到上世紀七、八十年代，沒有精細雷達及衛星資料的幫助，只能倚靠地面氣象站及海上船舶及浮標的氣象報告。這對於新一代的預報員，可以說是不可多得的經驗。

在預報熱帶氣旋路徑方面，現時主要是倚靠多個數值模式合成方法，基本上是利用各個模式的預報路徑，以加權平均法定出預報路徑，並不時因應實況觀測資料，調整預報路徑。

在6月28日晚上，當杜蘇芮橫過呂宋海峽時，Basco島上及附近船舶的報告證實它具有熱帶風暴的風力。考慮到杜蘇芮移動快速，天文台當晚於它進入本港800公里範圍內不久，即發出一號戒備信號。其後東沙島的報告支持杜蘇芮的預報路徑基本正確，並幫助識別在衛星雲圖上杜蘇芮的旋轉中心。天文台根據預報路徑在29日下午改發3號強風信號。在當日下午，本地風力開始增強。杜蘇芮顯然已進入本港256公里雷達範圍，但由於其雨帶疏鬆，我們無法在雷達圖象上追蹤杜蘇芮。同事們深感無奈，只有努力應付這一場"障礙賽"，以近岸浮標、海島上氣象站及部份在南海北部的鑽油台上的報告來繼續監測杜蘇芮的路徑及強度，但無可避免，杜蘇芮的定位及預報的不確定性相應增加。

6 月 29 日國家主席抵港在香港國際機場的情況，當時天文台已發出一號戒備信號 (上：文匯報圖片；下：政府新聞處圖片)

隨著杜蘇芮移近廣東海岸，天文台的自動氣象站及沿岸的氣象站開始發揮作用。接近黃昏時，作為香港的前哨站的橫瀾島開始吹強風。本地普遍吹強風的情況，亦預料很快會出現，因而是適當時候積極考慮再高一級的信號－8 號信號。

由於 8 號信號會促使全港各行各業基本停頓下來，故此，要否發出 8 號信號，從來都不是容易的決定。市民的安全當然是首要的考慮，但不必要地妨礙市民的活動，亦須避免。就杜蘇芮的路徑、強度、風力分佈及本港風力情況作出評估後，天文台於晚上 9 時許發出 8 號預警，表示在未來兩小時內改發 8 號信號。杜蘇芮進一步接近香港，並在翌日凌晨於天文台的西南 70 公里左右掠過，其後在澳門以西一帶登陸，並迅速減弱。本港風力亦相應下降，天文台於清晨 3 時許除下 8 號信號，並於早上 9 時前取消所有熱帶氣旋警告信號。

杜蘇芮襲港期間，本港有狂風驟雨，部份地區，尤其是離岸及高地吹烈風。幸好本港受到的損毀尚算輕微。29-30 日的大部分活動能夠如期舉行。天文台預警杜蘇芮的任務亦得以圓滿完成，大家如釋重負。

筆者在天文台工作 30 多年，近 10 年來，長期參與預報中心工作。今次於退休前最後的颱風季節裏，有機會在杜蘇芮襲港期間，以署理台長的身份，與預報隊伍一同處理熱帶氣旋的預告及警告業務，並成為香港天文台建立 130 年來，首位女性氣象人員簽發 8 號熱帶氣旋警告，真是機遇難逢，亦深感榮幸。

6 月 29 日晚上天文台在網頁上發佈將會發出八號熱帶氣旋信號的消息

忘不了的韋森特

岑富祥
Sham Fu-cheung

Mr. FC Sham is the Chief Experimental Officer responsible for organizing airport weather forecast and warning services. He recalled an unforgettable night during the passage of Severe Typhoon Vicente in July 2012. Vicente brought windshear, low level severe turbulence and microbursts to the Hong Kong International Airport. Monitoring the weather condition at the airport very closely, FC Sham and the aviation forecaster provided up-to-date weather information and issued warnings to the staff of the Civil Aviation Department, Airport Authority and airlines to support their operations and contingency planning. The team led by FC Sham experienced the ferocious winds at the airport control tower and treasured the opportunity in providing weather forecast and warning services to safeguard the airport under the No. 10 signal.

夜深了，我還在機場控制塔內通宵達旦地工作，渡過了一個不一樣的晚上！這全因為強颱風－韋森特。

韋森特進入南中國海後，先假裝向偏西移動，靠近香港經度時，速度放慢，然後小碎步轉圈，在温暖潮濕的海面上盤旋，吸收了大量的水氣，威力增強後，才向偏北移動，逐步靠近香港。

八號風球生效時，我和其他同事在傾盆大雨下，乘坐本台專車從東涌地鐵站進入機場控制塔，隨即瞭解天氣情況及跟進事項，便立刻開始值夜班的航空天氣預報工作。午夜前，韋森特逐漸靠近，風力及雨勢增強，機場範圍出現風切變和低空強烈湍流，加上出現微下擊暴流警告，機場航機升降量受到嚴重影響。機場預報員其中一項重要任務，就是更新機場天氣預報和向機場內工作人員發出天氣警告。當評估最新颱風資料，向機場氣象所主管匯報後，便立即更新機場天氣預報，把預測風力調高；接着把最新颱風資料通知民航處、機場管理局和航空公司，讓他們按照有關資料作出應變。

韋森特的中心距離香港雖有100公里，但由於暴風圈龐大，午夜後，部份地區已達至暴風程度。香港天文台於二零一二年七月二十四日零時四十五分發出自一九九九年來第一個十號風球！機場控制塔外，狂風挾着大雨肆虐，一切都變得朦朧不清。由於風力大得驚人，好像一對魔掌把控制塔搖來搖去，處身塔內令人感到一陣暈眩。控制塔的設計是可以抵擋暴風，安全不是問題，反而我有點兒擔心在外站工作的同事。暴風雨下，有同事在京士柏山用人手發放氣球，以測量颱風附近的高空氣象資料；在大帽山，有雷達機械組的同事留守，確保天氣雷達正常運作，他們處身的工作崗位，比機場控制塔危險得多。韋森特的暴風圈花了差不多三小時才掃過香港！這期間，令人仿如置身於黑洞，時間空

間都扭曲了，不其然擔心會否有意外或損傷，大家都緊守崗位，默不作聲地工作，只盼望風暴快些過去。

有些人認為十號風球下仍需工作，真是不幸。不過事情總有兩面，另一角度看，外站工作的同事就好像電影中「洛奇」的主角，不認命、不服輸，積極面對困難。疾風知勁草，我們應當向這一群默默工作者說一聲：「多謝」！

由於能夠在十號風球下當值，對天文台人員來說是很難得的機遇。機場氣象所的工作人員在十號風球緊守崗位，提供機場氣象服務，但亦不忘抽出片刻拍照留念。

130 有緣相聚

Under the same sky