BETWEEN THE NINE DRAGONS AND A DIVINE WIND: HOW HONG KONG'S WEATHER MIGHT HAVE AFFECTED AN ALLIED INVASION TO RETAKE THE TERRITORY

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Synopsis

In the War in the Pacific during World War II, the question of whether or not to engage Japan directly in China was a major one for Allied planners. If the Japanese weren't enough of a problem, an age-old factor - the weather - certainly would have provided the Allies with additional concerns. The Pacific and Asia are home to some of the most extreme weather in the world.

Hong Kong, a possible target in any Allied campaign in China, played host to some of this extreme weather. What this study attempts to do is to consider how Hong Kong's adverse weather conditions could have affected an Allied operation to recapture it from the Japanese.

Background

After Hong Kong fell to the Japanese in December 1941 and Great Britain was expelled from the Pacific, only the U.S. was left to face Japan in this theatre. The U.S. itself was in bad shape, as most of its Pacific Fleet had been mauled at Pearl Harbor. On the Asian mainland, Japan was still busying herself with China and Britain. A stalemate had developed with the former, while the latter was being pushed out of Burma into India.

However, the U.S. Navy's (USN) aircraft carriers were not caught in the Pearl Harbor debacle, and during much of 1942, they bore the brunt of the action against the Imperial Japanese Navy (IJN) in the Pacific. In a series of three engagements with the IJN (at Coral Sea, Midway, and Guadalcanal), with inferior numbers accompanied by

* The author would like to thank Mr. Ko Tim-keung for bringing a draft of this article to the attention of the Hon. Editor, and Professor Elfed Roberts for his comments on an early version of the draft.
heavy losses, the USN stemmed and then turned the tide of Japanese conquest by early 1943.

After evicting the Japanese from Guadalcanal, the Allies (mainly the U.S. and Australia) took advantage of this opportunity to move north against other Japanese positions in the Solomon Islands and New Guinea. This was the Southwest Pacific Area.

The USN, while assisting the Allied drives in the land-dominated Southwest Pacific, continued to wait for a chance to launch its own offensive in the Central Pacific Area, which was dominated by ocean. Such a drive was not opportunistic like the Southwest Pacific drive, but had been envisioned for almost 35 years prior to the war in the form of War Plan Orange (WP Orange).

The origins of WP Orange could be traced even further back to the last years of the 19th Century. During this time, many Japanese emigrated to the continental U.S. and Hawaii, and incurred the hostility of White Americans. In time, such acts aroused Japan's fury, who considered herself a great power after her defeat of Russia in the Russo-Japanese War of 1904-1905. Alarmed over Japan's growing influence in the Pacific, American war planners began to draft the forerunners of WP Orange in 1907.

In brief, WP Orange pitted the U.S. (Blue) against Japan (Orange). Orange planners expected the U.S. to lose the Philippines early in the war (which was what happened). The USN would steam all the way across the Pacific to recapture the Philippines, defeat the IJN in a decisive battle, and lay siege to Japan, eventually forcing her surrender. As for China (and Hong Kong), Orange planners had cautioned against trying to establish an American presence there. The Japanese were expected to have firmly planted themselves in and around China by the start of the war, and it was advisable for the U.S. to not undertake a campaign on the mainland.

The reality in 1943, however, was that there were other participants in the war, like Britain and China. Both had interests on the Asian mainland, and they could not be ignored. A common interest was Hong Kong, which both China and Britain wanted to recover after the war. At the start of the war, Hong Kong was a British responsibility, but
after Britain lost Hong Kong, the closest Allied power to the territory was its original owner China. Then there was Hong Kong's status as a port. Any mainland port that touched the Pacific attracted the attention of the USN, because it was in its interest that China continued to keep the bulk of the Japanese Army occupied on the continent while the U.S. seized Japan's possessions in the Pacific. Hence, Allied commanders like Admiral Ernest King, the USN's highest ranking officer and a member of the Joint Chiefs of Staff (JCS), thought that the U.S. had a major responsibility to help keep China in the war.\(^5\)

In 1943, China was tying down 20 per cent of the Japanese Army. No major fighting had occurred there for a while, but the Allies knew that this relative calm might not last. The fear that Japan would resume her efforts to knock China out of the war was real, and Allied planners wanted to prevent this by keeping the Chinese Army (of the Nationalist government) battle worthy. To do this, they had to establish and maintain secure lines of communication (LoC) into China. As Japan had already occupied China's ports and the lone road into China from Burma (the Burma Road), the sole means of supplying China was through a risky, costly, and feeble air route over the Himalayas (the Hump).

The best method of supplying China was to recapture a port on the China Coast and establishing LoC to the interior of China. Initially, the Chinese Army was allotted the bulk of this task - if it could be strengthened by deliveries over the Hump and (if the Allies could retake it) the Burma Road.\(^6\) But by 1943, supplies over the Hump remained minuscule, the Burma Road was not reopened, and the Chinese (Nationalists, Communists, and third party elements) preferred to fight among themselves rather than against the Japanese. With the Allied drives in the Pacific gathering momentum, the main responsibility for a campaign to recapture a port on the China Coast eventually fell to the U.S.

Hong Kong and Shanghai have long been the two best ports on the China Coast, with each possessing excellent harbour facilities. But Hong Kong rated ahead of Shanghai as the initial port to be opened up in China because of the strong Japanese presence around Shanghai. In the Hong Kong-Canton area during 1943, the Japanese still occupied only a beachhead. As long as Hong Kong remained a beachhead, and the Chinese forces ringing it maintained a measure of resolve, Japanese
forces to the north would tire themselves out trying to link up with the
beachhead. Should the Chinese collapse in the face of a Japanese attack,
then an Allied campaign to recapture Hong Kong would be jeopardized.

Japan had an incentive to retain Hong Kong. Besides being a part
of Japanese-held China, Hong Kong also lay just outside Japan’s Inner
Zone. This zone included Japan Proper, Korea, Manchuria, North
China, Formosa, the Pescadores, the Ryukyus, and the Japanese half of
Sakhalin Island. Well before the war, the British had already gained an
appreciation that a Hong Kong in Japanese hands would augment the
defence of the Inner Zone. Moreover, Hong Kong helped guard Japan’s
LoC to points west and her oil supplies in the Dutch East Indies. The
Japanese could still afford to trade space for time by forfeiting many
other parts of their Pacific empire to the Allies, but they were certain to
defend their Inner Zone and the positions that anchored their LoC to
and from it with the utmost vigour. If the Japanese lost Hong Kong,
this would provide hope to people living under Japanese rule elsewhere,
while it would send a message to the Japanese people that the war was
proceeding unfavourably for them.

By late 1943, the Allies had gained the upper hand over the
Japanese in the Pacific. It was the Allies who could dictate where the
next move would fall. As China was still in the game, Allied planners
began to take a closer look at the feasibility of a Hong Kong campaign.
One opponent the Allies couldn’t overcome, however, was Mother
Nature, so heed was paid to Hong Kong’s weather and how it could
affect an Allied campaign there.

A timeless enemy

Nature at its cruellest is a phenomenon that humanity’s best
efforts still cannot match. Even during a high-technology conflict like
World War II, the weather proved to be as indomitable a nemesis as it
had been throughout the history of war.

With World War II being fought over a greater expanse of the
planet than any other war in history, its participants had to endure
extreme variations in the weather, like the freezing cold of the Arctic
and the Soviet Union to the sweltering heat of New Guinea, or the
oppressive humidity of the South Pacific to the barren aridity of North
Africa. History has shown that the weather, a factor that most folks accept as a part of daily life, has helped decide the outcome of a few military campaigns.

Hong Kong’s climate was not as extreme as that of the Soviet Union or North Africa, but it could be a potential nuisance or menace to opponents battling for its control. Up to this time (1943), it had not shown itself to be a factor during the two most recent times Hong Kong changed hands - in 1841 and 1941. If the Allies returned to reclaim Hong Kong by force, they would likely be deprived of such a walkover.

Usually, the weather favours the defender, because he should have a greater degree of familiarity with his stronghold and probably be more entrenched against the invader and the weather. Although Hong Kong had been British territory for 100 years before the war, Japanese knowledge of Hong Kong was fresher because they were in control of it. Allied knowledge of Hong Kong’s weather was an inadequate substitute for actually being in Hong Kong. Things were certain to change in the territory after the British were kicked out, and they did.

Factors to consider

Hong Kong’s collection of unfavourable weather included rainfall, cloud and fog, temperature, humidity, and winds. All of these factors had already been experienced by the Allies elsewhere. If they considered the control of a specific territory to be crucial, then they would do just about anything to obtain it. Therefore, any objective’s weather could be no more than a secondary factor. Simply put, if an objective is chosen, the rationalisation would be that it was chosen regardless of its weather - because the advantages of having it outweighed the potential disadvantages posed by the weather or any other factor. Its weather would be played down, and the attackers would be prepared to suffer the consequences of trying to take it. On the other hand, if an objective is rejected, its weather could be played up (especially if it was potentially violent) as a cause for the rejection.

Rainfall

Hong Kong received an average annual total of 85 inches (2,159 mm) of precipitation, with the bulk of this amount falling in the middle
part of the year (May to August). In fact, it rained about two out of every three days during the months of June and July, with June having a better than 40 per cent chance of experiencing three or more consecutive days, and even a 25 per cent chance of having at least an entire week, of rain.

In a largely undeveloped place like Hong Kong during the war, heavy rains falling on land usually translated into mud. Thus far in the war, both sides had already experienced the difficulty of moving across mud in various theatres. In Hong Kong, only the urban areas had all-weather roads, so its roads and terrain outside of the urban areas were trafficable only during periods of dry weather.\(^{10}\)

Then one must remember that 75 per cent of Hong Kong was mountain. By the nature of their sloped sides and rocky terrain, mountains are already difficult to traverse in good weather. In times of bad weather, mountains are even harder to negotiate, especially if they have been stripped of vegetation. This was the case with Hong Kong during the Japanese occupation. As the war dragged on, supply shortages of everything became acute. Whereas coal was the preferred fuel for industrial and residential use, the increasing difficulty of importing this item into Hong Kong forced people to switch to firewood. This resulted in the felling of trees throughout the territory, thus depriving the mountains of the foliage that anchored their soil, and increasing the chances of erosion and landslides.\(^{11}\)

Machinery was the epitome of the Allied arsenal, and embodied from its factories, to its logistical functions, and finally to the fighting machines on the frontline. But machinery was also very susceptible to the weather. In Hong Kong, with its high rainfall and lack of all-weather roads outside of the city, construction activities would be needed to improve its roads for the vehicle-oriented Allies. But construction would be curtailed during periods of heavy rainfall.

Without a suitable system of roads, the Allies would be unable to take full advantage of their superior mechanised transport in Hong Kong. The necessity of supporting China with a strong LoC inland from Hong Kong would have taxed its inadequate roads past their limit. Estimates for the portion of supplies landed each day that could be transported inland to support the Chinese amounted to no more than 25 per cent,
and this was on a good weather day. An alternative was to utilize the sole railroad in the territory - the Kowloon-Canton Railway (KCR). However, the KCR was primarily a passenger railway, so rolling stock for transporting freight was in short supply.\(^\text{12}\)

A third option was to transport the supplies by water via the Pearl River and its tributaries, which lead up to Canton and points beyond. This method, if fully operational, would greatly increase the amount of supplies headed inland. It too was dependent on various factors, like Allied control of both banks of the Pearl, the availability of suitable river craft (Canton could still handle large vessels, but as the river branches out and tapers off, smaller vessels would be needed), and the weather.\(^\text{13}\) Without modifications, the mediocre communications inland from Hong Kong would not do justice to its generous port capacity.

As for ground operations, the Allies enjoyed a crushing supremacy over the Japanese in the quantity and quality of their armour, but Hong Kong's mountainous terrain would have ensured that armour could see only limited duty there.

On a bad day, mechanised transport would become bogged down on Hong Kong's muddy roads. The Allies would have felt Hong Kong eerily similar to Italy, a place that was also mountainous and experienced high rainfall. There, the Allies had armour superiority, but it was of limited value, and their advance was slow. Their advances along the coast were a bit faster because it was relatively flat, just like Hong Kong's. However, during bad weather days, a lack of natural ground in many of the coastal areas (due to urbanisation) to absorb rainfall could cause flooding. In addition, there was human-induced flooding. Southern China was still mainly an agrarian region, where farmers would deliberately flood their fields in April of each year to fertilize their crops.\(^\text{14}\) That added at least a month to the flood season.

Infantry would also find the combination of rainfall and challenging terrain as harsh for them as they would be for their vehicles, if not more. Without substantial support from mechanised forces, infantry would be deprived of a vital factor to combat the Japanese.

Air support, a key ingredient in offensive operations worldwide, and one in which the Allies enjoyed superiority and obviously hated to
do without, would also be affected by heavy rainfall. Incendiary bombing, which would become a favourite strategy with the Allies against Japanese targets elsewhere as the war progressed, would naturally be less effective during the middle part of the year in Hong Kong. Heavy rainfall also affects the performance of propeller aircraft by cooling their engines excessively.\textsuperscript{15} Overall, air operations of all kinds would be less effective or even grounded during periods of heavy rainfall.

The flip side of air operations is anti-aircraft defence. A simple, inexpensive device employed as an anti-aircraft measure was the barrage balloon. This was a large hydrogen-filled, dirigible-shaped balloon attached to a steel cable anchored to the ground or a ship and floated several hundred to several thousand feet above it. The cable was stronger than it looked, and was meant to discourage low-level air attacks by having the ability to damage or clip the wings of a low-flying aircraft. This forces the aircraft to fly higher, which decreases its attack accuracy, and aids the effectiveness of one’s own anti-aircraft artillery and intercepting aircraft.\textsuperscript{16}

However, a hydrogen-filled barrage balloon (in the days before helium use was common) is highly flammable. This is a liability during a thunderstorm, during which a spark of lightning could turn a barrage balloon into an incendiary hazard that is more dangerous to its user than to the enemy.

Cloud and fog

Cloud and fog often went hand-in-hand with heavy rainfall to restrict air operations. Reconnaissance of Japanese positions would be very difficult. High level bombing or close support, favoured by the Allies and employed extensively in other theatres, would have to be cut back or even cancelled. If cloud and fog were present at the beginning of the amphibious stage of the Allied assault on Hong Kong, when the Allies would be at their most vulnerable, crucial air support would be inadequate or even lacking. If the Japanese contested the landing, and this was expected, the Allies would be faced with a precarious and probably dangerous situation.

While cloud and fog are most prevalent during the beginning of
the year, relatively clear months like July and August might also be problematic since the middle of the year was the rainy season. Air power, one of the Allies’ biggest assets, might not realize its full potential over Hong Kong.

Another factor in which the Allies were much better endowed than their opponents was artillery, including naval gunfire. The latter had been, and would continue to be, invaluable in pulverising land targets before the actual amphibious landings. But naval and land-based artillery were very dependent on aerial and ground observers to achieve accuracy. If these were limited by cloud and fog, enemy targets would be inadequately softened up or even missed, thereby leaving more of the work to the ground forces. Then the role of Hong Kong’s ubiquitous mountains would become even more prominent. Even on a good day, artillery cannot completely neutralise an enemy who is well dug into a mountain. But it can still keep the enemy pinned down, making it hard for him to shoot back or launch counterattacks. A deficiency or absence of artillery and aerial support brought about by cloud and fog provides the enemy with a chance to come out and pull off a few surprises, especially an enemy who lives by the sneak attack like the Japanese.

Conversely, barrage balloons benefit from low ceilings because they could hide in the overcast sky, with only their thin wires exposed, and wait for unsuspecting enemy aircraft that may be flying low. Barrage balloons could be worthy supplements to the progressively effective Allied combat air patrol (CAP), which was a constant umbrella of aircraft patrolling the skies over any Allied position. When the CAP is limited by cloud and fog, barrage balloons can partially fill the void. The winter months in Hong Kong (the beginning of the year) were generally the best time to employ barrage balloons.

Temperature and humidity

Hong Kong’s temperatures only go in one extreme—upwards. Even during winter, they almost never approach freezing (32°F/0°C). February, Hong Kong’s coldest month, averages a tolerable 59°F (15°C). Certainly Hong Kong would not be mistaken for the Soviet Union of Alaska.

But the mid-spring to summer months (April to September) would
not be so kind to either side, though. Most days in Hong Kong during these six months would be too hot, too humid, or both. In fact, it was possible for every day in July and August (62 straight days) to experience temperatures exceeding 80°F (27°C). On some days, the temperature neared the 100°F (38°C) mark. Combine this with a punishing humidity (almost 90 per cent relative humidity from April to August), and the result is a formula for misery.

Ground operations may be affected because of the painful effects high temperatures and humidity could have on infantry during the heat of battle. Dehydration and heat stroke, just two of the maladies associated with high temperatures and humidity, don’t bear the same negative connotation as malaria, but both were just as effective at putting soldiers out of action. The Allies had already experienced these hazards in the Pacific and Burma, both of which boasted even higher temperatures and humidity than Hong Kong. In many of these campaigns, the conditions brought about by the temperature and humidity, like disease, were even more effective than the Japanese in causing Allied casualties.

On the logistical front, temperature and humidity also affect machinery, of which the Allies had plenty. The tools of war are always operated more intensely than peacetime machinery, and hence are always in need of maintenance. While it is usually more durable than peacetime machinery, military hardware is also more complex. In addition, due to its constant employment, military hardware inevitably breaks down and undergoes attrition, capture, and destruction. The desire of the Allies to maintain the strength and condition of their war machines at optimum levels was part of the reason why their support personnel well outnumbered fighting personnel, especially in the American ranks.

Having to service the hardware in a hot and humid environment like Hong Kong would be quite an ordeal for maintenance personnel. Moisture from the humidity accelerates the depreciation of equipment. High temperatures, combined with the high temperatures already generated by machinery being brought in during the heat of battle, only further complicate the maintenance problem. If the machinery cannot be serviced in a relatively cool place like a hangar or a shady spot, then the personnel may have to wait until night time or early in the morning, which would consume valuable time. Due to the wholesale clearing
of Hong Kong's forests for fuel, shady spots were increasingly hard to come by as the war progressed.

On a more insidious note, temperature and humidity could affect the employment of chemical warfare. Thus far in the war, the use of chemical warfare had been minor, with both sides retaining their stockpiles of chemical warfare agents as deterrents rather than as first options. But as the war increased in ferocity, there was always the possibility that one or both sides might resort to more unconventional means on the battlefield.

Hong Kong, however, probably would not have been a good place to start for any side that wanted to resort to chemical warfare. Depending on the type of chemical agent used, Hong Kong's high temperatures and humidity during the middle of the year could be too adverse towards the effective employment of certain chemical warfare agents. Too high a temperature (above 75°F/24°C) could cause a premature evaporation of some agents, and excess humidity means that more water is present to react with some chemicals and therefore dilute the agents. At the other end, too low a temperature (below 32°F/0°C) or humidity could also be unfavourable for chemical warfare. Hong Kong's temperatures never go that low, and its period of low humidity occurs during the last three months of the year, which for most other factors related to the weather was the best time of the year for a Hong Kong landing.

Winds

Being on the China Coast, Hong Kong received its fair share of winds, and then some. Winds could be unpredictable because they can change direction and speed. On the ground, a wind velocity of greater than 30 miles per hour (48 kilometres per hour) affects the accuracy of artillery fire control. If chemical warfare were employed, winds of greater than only 16 mph (26 kph) would blow any chemical agents (in gas form) off course, and a reverse wind could blow the agent back to the offending side.

Aside from thunderstorms, winds of greater than 30 mph (48 kph) could also diminish the value of barrage balloons. If the Japanese decided to attack the invading Allies in Hong Kong by air, they could try to exploit Hong Kong's mountainous terrain by flying low and using
the mountains to evade Allied radar, and then pouncing on Allied positions at the last minute, thereby achieving a measure of surprise. Depending on the strength of the Japanese response to the invasion, the Allied CAP may or may not have been able to handle all of the attackers. Moreover, the CAP would have been highly dependent on radar. Barrage balloons could partially compensate by being placed near a mountain pass where the enemy could be expected to pass through. This tactic, however, would be negated in the presence of strong winds, which can blow through a mountain pass faster than over a peak.

But air operations could be negatively affected by the wind too. Air drops of supplies depend on calm weather, lest the supplies become lost or fall into enemy hands. The same applies to bombing operations. In a compact setting like Hong Kong, a bomb that is blown even slightly off its target can fall on friendly territory or civilians. The dropping of airborne forces to secure certain objectives, already risky during good weather, is made infinitely more difficult when performed during periods of strong winds. (A wind of just 16 mph/26 kph is enough to blow a paratrooper well off course.) If airborne forces land too far from their objective, surprise would be lost because they would have to fight their way to reach the objective and sustain casualties in the process. Should they reach their objective, they would have to take additional casualties holding it. Sometimes they are left to their fate.

On the other hand, strong winds can benefit incendiary bombing, which depends on the wind to spread the flames farther - as long as they don’t spread in the wrong direction. All it takes was for a wind of more than 18 mph (30 kph) to do the job, and this was most common during the early months of the year in Hong Kong.

While Hong Kong was at its windiest during the winter and early spring, this was minor compared to the proliferation of typhoons during the summer (which, incidentally, is the mildest part of the year when there are no typhoons). A typhoon was the weather phenomenon that could do the greatest damage to a military operation in the Pacific.

Simply defined, a typhoon, which comes from the Chinese term tai fung, is known in meteorological circles as a tropical cyclone, which is a very strong mixture of wind and rain with sustained wind
speeds of at least 64 knots (1 knot equals 1.15 miles per hour). Unlike hurricanes in the Atlantic, Pacific typhoons can occur at any month, although most take place from May to October. Compared to the other weather factors that could influence a Hong Kong operation, a typhoon is more intense, more mobile, and more unpredictable. Even the USN lacked the means to predict the movement and intensity of a typhoon. If one was spotted by reconnaissance, the need to code and decode messages or to maintain radio silence meant that such information would be outdated by the time it was received. Typhoon tracking was very sketchy during the war, and remained so for decades thereafter.22

'It is a memorable experience to watch a big typhoon, but it is better to do so from a well-built house than from a ship at sea.'23

The power of a typhoon is beyond the ability of most people to gauge. Its sustained winds can reach 130 knots, while periodic gusts can exceed 150 knots. Rain accompanying a typhoon strikes early (usually when the centre of the typhoon is about 250 nautical miles away), late (the heaviest rainfall occurs after the passage of a typhoon's centre), and hard. The last refers to the horizontal motion of typhoon rains, which hit like knives or bullets, and could cause damage, destruction, injury, and death. The energy released by only a small-scale typhoon during a 24-hour period is equivalent to that of almost 500,000 atom bombs, or about 20 billion tons of water.24

Typhoons tend to weaken once they reach land, but that doesn't mean people are out of danger. On the contrary, for most people the danger has only begun. To give an example, in September 1937, Hong Kong was struck by one of the most powerful typhoons ever to visit the territory. Gusts of up to 145 knots were recorded, six inches (15 cm) of rain were dumped on the territory in just two days, and sea levels rose 15 feet (4.57 meters). Hong Kong's fishing community suffered the worst of it. Of the 3,500 junks and sailing craft present, 1,255 were sunk and 600 seriously damaged. The death toll from these losses totalled some 11,000.25 That was about one per cent of Hong Kong's population at the time.

In the Tai Po area of the New Territories, the carnage was even more frightening. Tidal waves of up to 30 feet (over nine metres) in height formed at Tolo Channel, crashed onto its shores at adjacent Tolo
Harbour, and engulfed everything in their way up to a quarter mile (400 meters) inland. At least 200 people were killed (a heavy loss, considering that the area was sparsely populated back then), and the Tai Po Road (one of Hong Kong’s few major roads at the time) and KCR were temporarily put out of commission, which isolated the survivors from the rest of Hong Kong for two days.  

In Victoria Harbour (between Kowloon and Hong Kong Island), 28 of the 101 steam vessels present were stranded, resulting in five deaths. Shore facilities on both sides of the harbour were wrecked, including Kai Tak Airfield. Fortunately for this part of Hong Kong, which was and remains the most congested part of the territory, no tidal wave struck here because the eastern entrance at Lyemun Pass was too narrow for enough water to break through. But Victoria Harbour was still vulnerable to strong winds and rough seas, which were what caused all that damage in its vicinity.

The implications that the “Great Typhoon of September 1937” (typhoons didn’t acquire female names until after the war) had on a potential Allied landing in Hong Kong were profound. First, all kinds of operations would be impossible during a typhoon. Everyone would worry about how to take shelter from the storm rather than fight the enemy. Given the expected relative positions of the two sides, the Allies were sure to be more exposed to the elements than the Japanese because they were on the offensive and had to establish LoC inland. Second, Hong Kong was intended to serve as a port of entry for LoC into China. With its extensive waterfront facilities, Victoria Harbour would have served as the primary berthing area for ships, and Tolo Harbour was considered a good secondary anchorage. Depending on the path of any typhoon that hits Hong Kong, Victoria Harbour may be afforded some protection by the mountains that surrounded it on the Kowloon side. Tolo Harbour (and neighbouring Plover Cove) was roomy and calm enough for ships - as long as there was no typhoon.

Once a typhoon hits Tolo Harbour, as it did in 1937, this area is at a disadvantage. Typhoons usually approach Hong Kong from the east or southeast, and Tolo Channel and Tolo Harbour are in the eastern part of Hong Kong. The winds in a typhoon blow in an anti-clockwise direction, which is an arc-like motion from east to west when one is facing north. In the case of Tolo Channel (which is the outlet to the sea
for Tolo Harbour), its entrance faced the northeast, which was like an open door for a typhoon. The 1937 typhoon took advantage of such a tailor-made entrance to surge through it with a tidal wave.\textsuperscript{30}

If a typhoon during peacetime could cause so much damage, then one of similar magnitude during wartime, when the stakes are higher, could really set back the Allied timetable. The Tai Po Road would likely have served as a conduit to funnel supplies north to China, and a disruption to its service (even temporarily) would do much to hurt the supply situation. Moreover, if LoC by land into China were that vulnerable, then LoC by sea to Hong Kong would be even more precarious. Such a supply line would likely come from the southeast and pass through the strait between Luzon and Formosa. This region also happened to be a major alleyway for typhoons, not to mention an area of strong Japanese concentrations if either Luzon or Formosa (or both) continued to be in enemy hands.\textsuperscript{31}

Due to their extensive commitment in the Atlantic, Allied merchant shipping and its escorts were more precious commodities in the much larger Pacific. The Japanese had not made it a policy to attack supply vessels thus far in the war, but that did not mean they would not alter this policy as the Allies pushed closer to the home islands. A typhoon, however, would not wait nor discriminate. While ships at harbour enjoy a little bit of protection from a typhoon, ships at sea don’t have this benefit. The only option was evasion, and that depended on knowing the whereabouts of the typhoon. As noted earlier, this was an extremely difficult task during World War II.\textsuperscript{29}

Another category of shipping in which the Allies weren’t as well endowed as they would have liked was landing craft. These vessels were mandatory for Allied operations in the Pacific. But Europe received first priority for landing craft for much of the war, leaving just enough for the Allies to take to the offensive in the Pacific. Hong Kong’s ability to serve as a lifeline into China depended entirely on a secure LoC that could be established to it by sea, and this in turn depended on the ability of the Allies to secure Hong Kong from the sea by an amphibious assault. The more landings the Allies carried out, the greater the toll on their landing craft, as the same craft would be used over and over. But landing craft were rather lightly-protected ships, which also made them prone to attrition through enemy action, breakdowns, and the weather.
So whether Allied LoC were disrupted by the Japanese or a typhoon, the end result would be the same - troops and supplies prevented from achieving their objectives, and Allied strategy would be hampered. The Allies could do something about the Japanese, but not much about a typhoon.

As nasty as it is, a typhoon does have a redeeming factor. The rain that accompanies it can help alleviate the water supply problem in a place as dependent on rainfall for its fresh water as Hong Kong (which itself has no rivers). During wartime, an adequate water supply was a most invaluable resource for both sides.23

The B-29

There was another important reason for recapturing Hong Kong: to use it as a base from which to bomb Japan. Before the war, China was thought to be the best place from which to do this.24 During her conquests of 1941-1942, Japan had wisely expanded her perimeter far enough so that she would be impervious to retaliatory bombing raids by Allied land-based aircraft, or so she thought. The Doolittle Raid on Tokyo in April 1942 was as unorthodox as it was daring, having been accomplished by land-based bombers operating from aircraft carriers, but it was not practical to replicate on a large scale. If the Allies wanted to devastate Japan, they needed a real land base and a bomber with enough range and bomb capacity to reach Japan.

That bomber was the Boeing B-29 Superfortress. It was classified as a Very Heavy Bomber (VHB), and it was, with a maximum bomb load of 10 tons, a range of 3,600 miles (5,800 km), and a top speed of 358 mph (577 kph). But it could not display all of these qualities at the same time, for speed and range decreased as the bomb load increased. The B-29 had been originally designed to operate from across the Atlantic to hit Germany, but once the older Allied bombers were performing adequately against Germany by 1943, the decision was made to operate the B-29 in the war against Japan. Initially, China was believed to be the best place from which to operate the B-29s.

Southeastern China, of which Hong Kong was a part, was deemed the best part of China to begin B-29 operations against Japan.25 The prerequisite, of course, was a strong enough LoC being established
into the territory. Kai Tak Airfield would presumably serve as the base for the B-29s. It was right on the shores of Victoria Harbour, which would make supporting the logistical requirements of the B-29 easier. On paper, its runways of between 4,500 to 4,800 feet long (1,372 to 1,463 metres) were just long enough to accommodate a B-29, which needed at least 4,375 feet (1,333.5 metres) of runway on a soft surface at sea level to take off. But such numbers were theoretical, because in practice a runway had to be much longer before it could safely operate a B-29. Lengthening Kai Tak’s runways would be time consuming, if not impossible, because the area around Kai Tak consisted of mountains and dwellings. While there were other places in Hong Kong that were under consideration for airfields, none were as well-equipped or logistically supportable as Kai Tak.

Furthermore, a B-29 needed sturdier, preferably all-weather, runways to support its maximum 70-ton weight, and Kai Tak’s runways were still mainly grass with a maximum load factor of 35 tons, although the Japanese began to convert them to concrete during the occupation. Prisoner of war labour was used to make this conversion, and sabotage ensued. By some accounts, the sabotage was so effective that in certain places the concrete could not even support the weight of a bicycle.

The B-29 was built to withstand extreme weather conditions - at least on its exterior. During its manufacture in the U.S., the first batch was fitted out in blizzard conditions outdoors. When this first batch arrived in India, the weather shifted to the other extreme. Midday temperatures in India went as high as 115°F (46°C), which limited takeoffs to the early morning or late afternoon. Also, India was humid during the summer, which was monsoon season. Its rainfall during this time was even heavier than that experienced in Hong Kong. Rains caused the fields in which the B-29s were parked to become muddy, and much effort had to be spent freeing them, thereby wasting time.

All of these factors combined to affect the serviceability of the B-29s if they weren’t maintained properly. In India, maintenance could only take place at night, which posed another problem. The maintenance crews required light to work during this time of the day, and the lights they used attracted insects, including malaria-bearing mosquitoes. Even without the weather, a good number of B-29s were out of order at any one time because such a new piece of equipment was bound to have defects.
Hong Kong's temperatures don't go as high as India's, but they are hot enough to affect machinery. The B-29's new instruments were especially vulnerable. In tropical areas (Hong Kong is semi-tropical), temperatures inside a B-29 during a hot day could reach 150°F (65.5°C). Besides affecting crew comfort, the heat takes a toll on the B-29's engines, which would be damaged if the temperature of its cylinder heads exceeded 428°F (220°C). If the engines haven't yet been damaged, they would have suffered decreased efficiency due to the higher temperatures, thereby requiring longer takeoffs. Temperature variations also affect the air pressure of a B-29's tyres. Improper inflation of tyres affects the takeoff and landing distance of an aircraft, and could result in shorter tyre life. Hence, early morning takeoffs were recommended if the B-29 were to operate from Hong Kong. A temperature of 75°F (24°C) demanded a 10 percent increase in runway length (due to the lower efficiency of the B-29's engines), and 20 percent if the temperature reached 100°F (37.7°C). But summers in Hong Kong would not be conducive to the efficient operation of a B-29, for even early morning temperatures during this period would have reached or exceeded 75°F.

Humidity and heavy rains can cause corrosion, fungal build-up, and ultimately malfunctions on idle B-29s. Electrical equipment is particularly at risk to such weathering, and when that is gone, the B-29 has lost its technological edge. Idle engines are also affected by heavy weathering, which can contaminate engine oil with impurities and thus damage the engine.

Then there is the all-powerful typhoon, which could pose a serious threat to B-29 operations. In July 1946, Hong Kong was hit by another typhoon, and Kai Tak got the worst of it. Winds of up to 130 knots were recorded. The runway was holed, and five transport planes and two Sunderland flying boats, all unserviceable, were lost - a testimony to the vulnerability of grounded aircraft to the weather and anything else. The toll would have been higher had some aircraft not been evacuated prior to the typhoon's arrival. Although the Allies did not have the power of foresight during the war, they already knew about the 1937 typhoon, which also damaged Kai Tak.

A loss of seven planes might have seemed tolerable to the materiel-rich Allies, but not so in the case of the B-29. It was the most expensive project of the war (US$3 billion in those days) - even more expensive.
than the US$2 billion Manhattan Project that built the atom bomb - and its total production run stopped just short of 4,000. (In comparison, the combined production run for its predecessors - the B-17 and B-24 - surpassed 30,000.) As previously mentioned, the B-29’s novelty was enough to render some of its numbers unserviceable due to mechanical failures. But a low production rate and a shortage of trained air crews and fuel also contributed to its meagre deployment when it first went into action in 1944. In a place like Hong Kong, bad weather could reduce the number of operational B-29s even further.

The fuel shortage problem was exacerbated when the JCS ordered that bombing operations against Japan commence before Hong Kong’s recapture. Thus, the B-29s began bombing Japan from bases in Central China. Such extreme distances for the time - about 1,600 miles (2,575 km) from their targets - increased the fuel consumption of each aircraft and reduced its bomb load to two tons. As a land or sea route into China had not yet been reopened, all supplies had to be flown in over the Hump by the B-29s themselves (sometimes supplemented by B-24s), which was a wasteful task because each B-29 had to expend two tons of fuel to haul one ton of supplies. These early bombing missions were inauspicious, with a good raid numbering only about 100 unescorted B-29s (compared to the 1,000-plane raids the Allies were by then routinely making against Germany), and usually less. The primitive airfields of Central China were not all-weather; although the runways would be painstakingly constructed to such standards, and a few B-29s would sometimes be mired in mud after heavy rains and therefore written off for a mission.

Tokyo (enemy capitals were used as benchmarks), however, lay beyond the range of a B-29 operating out of Central China. If B-29s were to operate from Hong Kong, which was about 1,800 miles (2,897 km) from Tokyo, each bomber would theoretically be able to carry only about 20 percent of its maximum 10-ton bomb load. This doesn’t take into account other factors, like the need to fly off course and make evasive manoeuvres during combat, and obviously the weather. This would necessitate cutting back even further on bombs in favour of more fuel. While B-29s based in Hong Kong could bomb other areas of Japan that were closer, the Allies knew that only an ability to get off consistent and heavy strikes at the Japanese capital would have the desired political, if not military, effect on the enemy. Hence, a bomber
utilizing only 20 per cent of its bomb capacity was not the way to obtain satisfactory returns on a US$3 billion gamble. Even worse was a bomber that could not make it to the runway due to breakdowns or adverse weather.

Eventually, the Allies captured the Marianas Islands in the Pacific, and the B-29s were transferred there. The Marianas also suffered from typhoons, but they were closer (no more than 1,600 miles) than Hong Kong to Tokyo. When the B-29s began bombing Japan from the Marianas, each plane carried about two tons of bombs. The results continued to be unsatisfactory, and were an indication of how the B-29s likely would have fared had they operated from Hong Kong. Not until the Allies acquired more aircraft and tried a new tactic - stripping down each B-29, loading it with six tons of incendiary bombs, and making them fly lower to ease the stress on the engines - did Tokyo begin to burn, as it did in March 1945, when as many as 100,000 of its inhabitants were incinerated in one raid.

Aside from its distance advantage, the Marianas were also safer from Japanese interference than Hong Kong. This advantage became even more significant later in the war, when Japanese control of the Pacific ebbed, but swelled in China. Should the Japanese not contest an Allied landing on Hong Kong, they were expected to harass the LoC established into it with a sizable naval force. The Hong Kong area was a good place for the Japanese to make their stand. They had shorter LoC plus the potential support of land-based aircraft from nearby Japanese-held areas. The Allies, presumably coming from the southeast, would have extended LoC that were potentially vulnerable to attack on the flanks, and such LoC would be passing through a typhoon-infested area.52

So it was evident how vital a secure LoC into Hong Kong from the sea was in order for B-29 operations to begin from there. In the absence of such a LoC, the strategy of having the B-29s fly their own supplies to Hong Kong (if the Allies somehow managed to recapture it by land), like they did for Central China, would be impractical. Even without Japanese interference, the weather alone was enough to ensure that establishing and maintaining LoC into Hong Kong would be a monumental undertaking indeed.

But, until the Central Pacific drive made better progress, China
remained an integral part of Allied strategy to defeat Japan. Even if her expected contribution to Allied victory over Japan had been downgraded and a squadron of B-29s based on the mainland was not as promising as a combat-ready Chinese Army, the politics of basing such a new and promising weapon on Chinese soil were thought to be enough to boost Chinese morale.\textsuperscript{43}

**The issue is in doubt**

By the end of 1943, Allied planners had not settled on a decision to drop Hong Kong from the list of future objectives, nor did they elevate its status to that of a territory whose possession was beyond debate. In short, if a campaign in China was likely, a port on the China Coast would need to be opened up, and Hong Kong was a leading candidate for such a port. The development of the war in 1944-1945 would determine Hong Kong’s importance.

As the USN’s Central Pacific offensive gathered momentum in early 1944, the adjacent Southwest Pacific offensive under General Douglas MacArthur also stepped up its pace so as not to be left behind. The competing dual advances sped up the Allied timetable, and brought the Allies to within striking distance of Japan by summer 1944.

In China, it was a different story. Chinese forces here had not faced a major Japanese attack since 1938. When the Japanese attempted to link their possessions in the south (including Hong Kong) with the large portion of China they held north of the Yangtze River with a major offensive in the summer, the Chinese forces standing in the way largely disintegrated without offering much resistance. By early 1945, the Hong Kong beachhead had linked up with the rest of Japanese-held China. By now, the prospect of recapturing Hong Kong from the sea, while still not entirely infeasible, was made harder due to the potential ease with which the Japanese could reinforce Hong Kong from the interior of China. Intelligence reports indicated that the Japanese probably intended to wage a last-ditch defence of Hong Kong like they were already doing in the Pacific.\textsuperscript{54}

The Japanese eventually overextended themselves in China, while China belatedly began to receive supplies in some quantity once the road link from Burma was reopened and the air link over the Hump
became more secure. This allowed the Chinese to reoccupy some of their lost territory as 1945 progressed. Talks of an attempt on Hong Kong from the interior of China were revived, although a Hong Kong in Allied hands was now considered a luxury rather than a necessity. The USN was still expected to make a contribution, even if it was only to finally open up a port in China to further alleviate her supply situation, and the possession of which would complete the blockade around Japan and the Inner Zone.  

Whether the USN, the chief underwriter of the Allied offensives in the Pacific, had enough resources for only a luxury objective was another story. As the Allies neared Japan, they encountered the wrath of two types of "divine wind." The first was man-made in the form of massed Japanese suicide plane attacks on the USN and Britain's Royal Navy (RN). This was the Kamikaze, and was the ultimate desperation measure employed by the Japanese in a bid to stem the Allied advance. While the measure eventually failed, it proved extremely nerve wracking for the Allies to face it down, and men and ships were lost in fighting off this threat. The prospect of more Kamikazes awaiting an invasion of Japan did not sit well with the USN.  

The second was the more natural typhoon. The USN's Third Fleet had the misfortune to be caught in two of them during the last nine months of the war. The first typhoon hit the Third Fleet in December 1944 off the Philippines with winds of 125 knots. It claimed three destroyers sunk and 28 other ships damaged, 146 aircraft destroyed, and almost 900 dead or wounded. The second typhoon struck in June 1945 off Okinawa. This one wasn't as deadly, with winds kept below 100 knots, but it still damaged 33 ships, destroyed or damaged 92 aircraft, and killed or wounded 10 men. The Japanese could not have done so well in a conventional attack by this stage of the war.  

The end of the war did not spare the USN from further punishment. In October 1945, a large assembly of support vessels was struck by a typhoon off Okinawa. Winds of 100 knots and waves as high as 35 feet (almost 11 metres) combined to damage, ground, or sink almost 270 ships, most of which were amphibious vessels. The typhoon also damaged over 60 aircraft and inflicted almost 200 casualties, including 36 dead. Shore facilities and supplies were also extensively damaged or destroyed. Fortunately, the war was over, or else the loss (even
temporarily) of so many valuable amphibious vessels would have set back any invasion of Japan, or elsewhere.\textsuperscript{57}

In addition, after Japan agreed to surrender in August 1945, several ships of the RN heading to Hong Kong to re-establish British rule over the territory were caught in a typhoon and suffered losses.\textsuperscript{58} In all four cases, together with the 1937 and 1946 typhoons that straddled the war, the Allies suffered substantial losses without being able to hit back - because there was nothing to hit! Hence, the Japanese got their "divine winds," but none were able to save them from defeat.

**Conclusion**

It should be noted that neither of the two typhoons that consumed the Third Fleet nor the one that hit Okinawa right after the war were as powerful as the 1937 or 1946 typhoons that hit Hong Kong. Still, the typhoons were strong enough to rattle and even damage the largest and best protected warships, including collapsing the forward flight decks of two aircraft carriers and slicing the bow off a heavy cruiser in the June 1945 incident. (The ships survived, but the cruiser and one of the carriers were knocked out of the war.)\textsuperscript{59} Support vessels, which are not as sturdy nor as fast as the biggest warships, would stand to suffer even more from a typhoon, as demonstrated by the October 1945 storm.

For the weather to prevail in a military campaign is one of the most cost-ineffective ways to lose the campaign. The enemy would have suffered few or no losses in return, which is damaging to morale. On the other side, however, if by a certain stage of the war the weather has become one’s most formidable ally, then that is usually an indicator that he has shot his bolt, and has to depend on something outside of his control.

The weather factors examined range from seemingly trivial to potentially devastating. All, however, are capable of causing unnecessary losses if either side has paid insufficient heed to any of them. In land operations on terrain as mountainous as Hong Kong’s, more weight is put on the ability of the foot soldier to achieve key objectives, because the help afforded by machinery would be relatively limited. But the foot soldier is usually more vulnerable to the elements than his supporting machinery. Certainly machinery could be replaced,
but it was harder to replace soldiers with combat experience.

Because the weather changes from day to day, so must the extent to which it could influence the approval or rejection of a certain operation in war. Hong Kong’s weather, as formidable as it was, could not by itself determine if it merited recapture or not. Nor could any objective’s weather be the lone factor. If it was, then many of the war’s campaigns would not have taken place. If the control of a specific territory was judged crucial, then the powers concerned would do anything within their capacity to seize or retain it.

No place in the world has perfect weather at any time of the year. In Hong Kong’s case, its worst weather occurs during the middle of the year. Had a Hong Kong operation taken place, Allied planners would have naturally preferred that it take place towards the end of the year. That would give the Allies up to six months of relatively trouble-free weather with which to work. A Hong Kong operation was bound to include amphibious landings, and these were very susceptible to bad weather. It was important for the Allies to gain at least a foothold on land, as it would give a political and psychological boost to the Allied war effort, as well as put them in a better position militarily vis-à-vis Japan. The China Coast was a perimeter within Japan’s empire, and any breech made here would accelerate Japan’s demise. So that first foothold was vital, just as it was equally vital for the Japanese to prevent it. In Japan’s history, foul weather had worked in her favour when she had to defend against an amphibious invasion, so it wasn’t unprecedented for the weather to play a decisive role in war. For the Allies, the last thing they would want was to see a Hong Kong operation in progress be thwarted by a non-human entity like the weather. Such a contest would be a no-win situation for the Allies.

In the end, the Allies never carried out any landings on any port on the China Coast. Their destruction of the IJN and blockade of Japan by sea and air was so complete that they didn’t have to worry about the Japanese in China, which remained a secondary theatre at the end of the war. Hong Kong’s weather was never specifically mentioned as a factor, but was probably on the minds of some Allied planners after the poundings their navies had taken in the last months of the war. Hong Kong returned to British, and eventually Chinese, rule, and was fortunate to have not undergone a destructive campaign for it to change hands again.

Miller, p.21-22, 24.

Miller, p.33-36.


Ernest J. King & Walter Muir Whitehill, *Fleet Admiral King, A Naval Record* (New York: W.W. Norton & Co., Inc., 1952), p.432. The JCS was the military committee that directed the war on the American side.


Colonel Lindsay T. Ride, "Memorandum on the Liberation of Prisoners-of-War, Hong Kong," 30 Sep 43, p.11-13; Series 2/33, BAAG (British Army Aid Group) Correspondence Concerning Operations, September 1942- November 1943; Personal Papers of Sir Lindsay Tasman Ride (microform); Canberra, ACT: Australian War Memorial, 2001 (hereinafter known as the Ride Papers).

Unless otherwise noted, information for this section was collected from Weather Information Branch, HQ, USAAF, R&A Report #71087, "Climate of Hong Kong (China)," October 1943; Intelligence Reports ("Regular Series"), 1941-1945; Research and Analysis Branch Division; Records of the Office of Strategic Services (OSS), RG 226; National Archives (NA), Washington, DC.

Later, it was reported that an all-weather road ran from Hong Kong to Canton, and the Japanese had improved other roads nearby to the same capacity. See "G-2 Estimates of the Following Places: Haiphong-Liuchow Peninsula-Hainan Island-Hong Kong-Swatow-Amoy-Foochow-Santuao-Wenchow-Hangchow Bay Region-Laoyao-Chingtao-and the Tip of the Shantung Peninsula to Include Wei Hai Wei," 17 Feb 45, p.5; Ch.7 - Intelligence, Correspondence, 1945, Folder
"Naval Group China Papers," RG 38; NA, Washington, DC (hereafter referred to as "G-2 Estimates").

(1) KWIZ 66/52, 6 Jul 44; Series 10/17, KWIZ (Kweilin Intelligence Summary) nos. 66-69, September-October 1944; Ride Papers. (2) "Enemy Press Extracts: 17 Mar 45-14 Apr 45," 31 May 45, p.1, 4, 7; Series 2/37, Contains Correspondence Relating to the Closure of BAAG and Intelligence Reports, December 1942-November 1945; Ride Papers. (3) Stella L. Thrower, Hong Kong Country Parks (Hong Kong: Government Printing, 1984), p.97.

Navy Department, Office of the Chief of Naval Operations (OP-30), Bureau of Yards and Docks, "Joint Preliminary Study for Advanced Base: Hong Kong Including Port Shelter and Mirs Bay," Nov 44, p.10-11, 14; Foreign Publications and Reports, 1940-50, Guatemala-Hong Kong; Office of Naval Intelligence; Records of the Chief of Naval Operations, RG 38; NA, Washington, DC (hereafter referred to as Navy Department, "Advanced Base: Hong Kong").


CPS 107/1, "Plan of Campaign Within China," 24 Apr 44, p.15; ABC 384 China (12-15-43), Sec. 1-A; Top Secret "American-British-Canadian" Correspondence (known as the "ABC" File) Relating to Organizational Planning and General Combat Operations During World War II and the Early Postwar Period, 1940-1948; Office of the Director of Plans & Operations; Records of the War Department General and Special Staffs, RG 165; NA, Washington, DC.

Hong Kong Royal Observatory, Tropical Cyclones and Aircraft Operations in Hong Kong (Hong Kong: the Observatory, 1976), p.2 (hereafter referred to as HKRO, Tropical Cyclones).

The case for the barrage balloon is made in Major Franklin J. Hillson's (USAF), "Barrage Balloons for Low-Level Air Defense," Aerospace Power Journal (Summer 1989). The author said that barrage balloons were still a viable concept in 1989, by which time technology had progressed and the Cold War was winding down. (Article is available online at http://www.airpower.maxwell.af.mil/airchronicles/apj/1989Articles/hillson.html.)

The "Climate of Hong Kong (China)" study did not state how low humidity had to be to have an adverse effect on chemical warfare, although it seemed to imply that Hong Kong's 58-62 per cent relative humidity from October to December
would be unfavourable.


19 Spring 1944 estimates for the number of Japanese aircraft able to oppose a Hong Kong landing numbered 400, with perhaps another 1,150 in nearby areas able to be diverted to Hong Kong. Allied planners believed that they could maintain a CAP of about 120 aircraft over Hong Kong at any time. See (1) CPS 107/1, p.35-36, 40. (2) JIC 177, “Campaign in China: Japanese Aircraft Available to Oppose a Landing in the Hong Kong Area,” 21 Mar 44, p.3-4; CCS 381 Hong Kong; RG 218; NA, Washington, DC.

20 Heywood, p.15.


26 (1) HKRO, Meteorological Results, p.6. (2) *South China Morning Post (SCMP)*, September 4, 1937, p.12.

27 (1) HKRO, *Meteorological Results*, Appendix II. (2) Charles E.J. Father, *Airport of the Nine Dragons: Kai Tak, Kowloon* (Surfer's Paradise, Queensland: Ching
Typhoon winds that approach Hong Kong from the southeast blow on Victoria Harbour from the north, so Kowloon's mountains can serve as a partial barrier. See Donald Alan Mantner & Samson Brand, *An Evaluation of Hong Kong Harbor as a Typhoon Haven* (Monterey, CA: Environmental Prediction Research Facility, Naval Postgraduate School, 1973), p.53.

Navy Department, "Advanced Base: Hong Kong," p.14-15. However, Tolo Harbour could do little more than serve as a secondary anchorage because shore facilities in Tai Po were limited.

(1) Heywood, p.7-8. (2) Adamson & Kosco, p.12. Although described by many sources as a "tidal wave," the wave would be more appropriately described as a storm surge because it is not caused by the moon.

The evasion option became more popular after the war, probably because of better typhoon location and tracking methods. See Mantner & Brand, p.78-79, 88. The authors cited British and American dissatisfaction with Hong Kong as a "safe haven" for ships during a typhoon.


CPS 83, "Appreciation and Plan for the Defeat of Japan," 8 Aug 43, Map F; CCS 381 Japan (8-25-42), sec.6; Geographic File, 1942-45; Records of the U.S. Joint Chiefs of Staff, RG 218; NA, Washington, DC. The map shows that Hong Kong lay within the minimum area required for the air bombardment of Japan.

United States Army Air Force, *B-29 Erection and Maintenance Manual* (Dayton,
OH: USAAF, 1944), p.178 (hereafter referred to as USAAF). The higher the altitude of an airfield, the softer the surface of its runway, and/or the heavier the B-29, the longer its runway had to be for the aircraft to take off. Kai Tak was at sea level, but its runway was soft-surfaced for much of the war.

The B-29 runways that were constructed in India and China were 8,500 feet (2,591 metres) long and hard-surfaced. See Keith Wheeler and the editors of Time-Life Books, Bombers Over Japan (Alexandria, VA: Time-Life Books, 1982), p.99.

Peter Pigott, Kai Tak: A History of Aviation in Hong Kong (Hong Kong: Government Printers, 1990), p.67. After the war, the press reported that the Japanese had cleared some residences and hills around Kai Tak to make way for its expansion. See SCMP, September 11, 1945 (Morning Edition), p.2.

The Japanese apparently had a scheme to extend one of Kai Tak's runways to about 5,580 feet (1,700 metres), which still didn't allow much latitude for B-29 operations. See "Japanese Scheme for Extension of Kai Tak," 7 Nov 42; Series 10/38; WIZ (Waichow Intelligence Summary) Vol.2; Nos.27-72 (Excluding Nos. 35, 37, 64, 65), April 1943-April 1944; Ride Papers.

USAAF, p.178. The U.S. also faced a rubber shortage after Japan gained control over most of the world's natural supplies. But it eventually produced synthetic substitutes.

According to temperature data available for the three most recent years before the war in Hong Kong (1937-1939), early morning (1-5 AM) temperatures began to approach 75°F by late April, and didn't dip well below this figure until mid- to late November. See HKRO, Meteorological Results, 1937, 1938, and 1939 (Hong Kong: Government Printers, 1938, 1939, and 1940) for hourly temperature readings for each day of the year.
45 USAAF, p.178.


48 CCS 323, "Air Plan for the Defeat of Japan," 20 Aug 43, p.3; CCS 373.11 Japan (8-20-43), pt.1; RG 218; NA, Washington, DC.

49 The mission for B-29s flying their own supplies over the Hump was codenamed MATTERHORN (for the B-24s DRAKE). See (1) CPS 86/2, "The Defeat of Japan Within Twelve Months After the Defeat of Germany," 25 Oct 43, p.4; sec. 8; RG 218; NA, Washington, DC. (2) CCS 417/2, "Overall Plan for the Defeat of Japan," 23 Dec 43, p.10-15; sec.10; RG 218; NA, Washington, DC.

50 Wheeler, p.35, 59. The runways in China were 19 inches (almost half a metre) thick and made of hand-crushed rock.

51 CPS 86/2, Map II, "B-29 Factor of Effectiveness at Various Ranges". The exact ranges and maximum bomb load at each range are as follows:

- 1,367 miles (2,200 km) 10 tons
- 1,484 miles (2,390 km) 8 tons
- 1,614 miles (2,600 km) 5 tons
- 1,860 miles (3,000 km) 2 tons

As the figures show, an extra 500 miles (805 km) one way for a B-29 theoretically reduced its bomb load by 80 per cent!

52 Waichow Intelligence Summary No.16, 14 Jan 43, p.9; Series 11/7; Chop Suey, WIS Sub-Division No.1; Prisoner of War Camps and Covering Letters: File Ref. 5668/A; Waichow Intelligence Summary Nos.29-34; May-June 1943; Ride Papers. Allied planners believed that the Japanese could commit up to four battleships and three fleet carriers to harass Allied LoC to Hong Kong. See CPS 107/1, p.37, 119.

(1) South China Weekly Situation Report No.4, 30 Mar 45; Series 1/1; War Diary, January-April 1945; also includes South China Weekly Situation Reports Nos.1-23, 9 Mar-23 Oct 45; Ride Papers. (2) South China Weekly Situation Report No.14, 8 Jun 45 (rest of details the same as above).


Adamson & Kosco, p.149-150, 190.

Commander in Chief, U.S. Pacific Fleet and Pacific Ocean Areas Report, Serial 0395 of 11 February 1946; Entry 351; World War II Action and Operational Reports; RG 38; NA, Washington, DC.

Alderson, p.57.

Adamson & Kosco, p.52-53, 185-187. Interestingly, the carriers in question, the *USS Hornet* (CV-12) and *USS Bennington* (CV-20), had survived previous Japanese attacks (including Kamikazes) without suffering anything worse than strafing, but they couldn't escape the typhoon.

CPS 107/1, p.15.
A pre-war map of Hong Kong, circa 1930s