CHAPTER - II

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Shortly after the Japanese attack on Pearl Harbour, President Franklin D. Roosevelt of USA had remarked that he would like to bomb the enemy mainland as soon as possible to avenge the attack. The intervening distance made it seem like wishful thinking until it occurred to the operations officer on Admiral King's staff that long range Army bombers might be launched from a carrier's deck. The idea intrigued King and the Army Air Corps.¹ To give this idea a practical shape twenty-four specially selected air-crews were put through an elaborate training at Eglin Field, Florida. They practised to perfection to take off from just 500 feet runway in modified twin-engine B-25 bombers. Finally, for this ultroneus mission sixteen crews were shortlisted. Lieutenant Colonel James H. Doolittle, an aeronautical

scientist and a daring pilot with several speed records to his credit, was to lead a team of sixteen crews (sic). ²

On 18 April 1942, starting with Doolittle's take off at 7.20 a.m., all the sixteen aircraft took off from 467 feet runway of USS carrier Hornet. Doolittle had briefed his team that "thirteen planes would drop their four bombs apiece on Tokyo; three single planes would hit Nagoya, Osaka and Kobe. They were not to return to the carrier but after having overflown Japan, were to make for small fields in China." ³

After almost five hours of uneventful flying, at 12.30 p.m., the first five bombers of Doolittle's team were carrying out sweeps over Tokyo and one of the crews, Fred Braemer, released the first bomb. There was no effective opposition, from the Japanese fighters or anti-aircraft batteries, as plane after plane, dumped its explosives over unwary and unsuspecting Tokyo. Captain Edward York, one of the pilots, discovered that he did not have enough fuel to make it to China. So, he turned north-west for Vladivostok in Soviet Russia, knowing fully well that he would be

2. Ibid., p.305.
3. Ibid.
interned. He landed safely in Vladivostok, where the plane's crew of five was taken into custody by the Russians. The other fifteen bombers could barely make it to Japanese-occupied China. Amongst those, three men were killed in crash-landings or bailouts, and eight were captured and brought to Tokyo for trial. The rest, including Colonel Doolittle, were very much alive and headed for Chiang Kai-Shek's lines by means of various routes.

This pioneer raid in itself did little material damage to the Japanese. But it certainly lifted the morale of Americans, still shaken by the fall of Bataan. It seemed to be a pledge that America would soon go over to the attack. This daring raid by the Americans awakened the Japanese authorities rudely. They could no longer believe that Japan was impregnable to bombings. It forced the Japanese to retain fighters at home to repel further similar attacks. For the first time some of the Japanese began to doubt whether victory was certain. And, it was more than two years before the US army Air Forces again bombed Japan. According

4. Ibid., p.309.
to the *United States Strategic Bombing Survey*:

The Japanese started the war aware of the fact that a major offensive action cannot be undertaken without local control of the air. They also appreciated the vulnerability to air attack of surface objectives, both on land and at sea. The Japanese failed, however, to appreciate the full scope and complexities of the requirements for continuing control of the air.⁶

The Japanese Air Forces were primarily designed and trained for cooperation with the army and navy, and were mostly armed with fighters, fighter-bombers and torpedo-bombers. They had expected the war to be swift, short and conclusive. They were, indeed, ignorant to a great extent of the true meaning of air power.

American military planners had been deliberating upon the means to destroy the Japanese islands of Hokkaido, Honshu, Kyushu and Shikoku by means of incendiaries even before the Japanese attacked Pearl Harbour on 7 December 1941. It was a sort of raw response culminating into full fledged hatred against the expanding influence of the Japanese. A meticulous research was being carried out as to the effects of incendiaries on the Japanese houses and

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buildings. The air warfare as advocated by Giulio Douhet and Billy Mitchell was the subject of deep interest and elaborate discussions at the Air Corps Tactical School with specific reference to Japan. During the spring of 1939, one of the school's instructors, Major CE Thomas, delivered a lecture on air operations against Japan. He described Japan as a compact, highly integrated modern industrial state, as an ideal objective for aerial bombings. The earthquake and fire of 1923 had demonstrated the fearful destruction that incendiary bombs could inflict on Japan's cities. Major Thomas speculated that direct attack against Japanese civilians might prove highly effective in breaking their morale. But according to him humanitarian considerations would rule out this kind of warfare.7 In 1940 the National Defence Research Committee was established in USA to coordinate the military work of American scientists in order to create incendiary weapons.

When the Second World War erupted on 1 September 1939, it brought to the fore the dominant role of 'Surprise' as an

element of War and the increasing lethal power of Air Forces. It appeared as if the sayings of Giulio Douhet and Billy Mitchell were there to be fulfilled.

Luftwaffe (German Air Force) destroyed the Polish Air Force in an air raid lasting just a few hours. German Stuka bombers and tanks completely shattered any trace of organized resistance from the Polish ground forces. Between 1939 and 1940 Luftwaffe did not come across any resistance in the European continental skies. Holland, Belgium and France were given a severe beating by the Germans. Great Britain, too, was receiving its daily dose of bombs from the skies and was trying hard to put up a heroic fight to sustain herself.

Japan was making deliberate inroads into the imperialistic interests of Great Britain in Asia. American leaders were watching the Japanese exploits in China and the indiscriminate use of Air Power by the Germans, against non-combatants and civilians in Poland, Holland, France, and Great Britain. In the light of all these developments, President Roosevelt exhorted his people, in his address to the US Congress on 16 May 1940, to recast their thinking about national protection. He called upon the Americans to
possess the ability to turn out at least 50,000 planes a year in order to meet any possible contingency.8

The Japanese, while carrying out the attack on Pearl Harbour, had perhaps assumed that it would provide them an ascendancy on the sea and ensure sufficient defence in oceanic space to establish a basis for a sustainable position. In the Pacific setting the aircraft carriers assumed a capital ship status. Their important role was conclusively reconfirmed in the decisive battles in the Coral Sea and at the Midway. The Japanese soon lost their supremacy in aircraft carriers to Americans in battles which were fought beyond the range of surface fleets. Battles at Sea were now being increasingly fought by the aircraft off the carriers rather than by battleships. By gaining local command of the air and commencing island-by-island advances, the US Army Air Forces weakened the Japanese Air Forces, beyond the point of recouperability. Aircraft carriers helped to extend the range of aircraft by moving close to

the intended target areas for bombing. It also resulted in the achievement of a local control of the air, which enabled the amphibious operations for the seizure of island-air bases.

The Pacific campaign entered the final phase when the Japanese home-islands were brought within the radius of operation of B-29 Superfortress bombers. In these operations in the south-west Pacific, the bulk of the Allied forces were provided by the United States while the British bore the main brunt of the campaign in Burma. There were, in addition, a substantial number of Australian and New Zealand forces in both the theatres of war. Sir Robert Saundby observes:

The sequel to the attack on Pearl Harbour was like the bursting of a dam. The Japanese armies flowed outwards till they had spent their force and gradually rumbled to a halt. The most difficult task facing the Allies was to stop retreat. They had to get rid of the defensive attitude that was in danger of becoming a habit, and inculcate an offensive spirit...It was fortunate for the Allies that the military knowledge and the skill of the Japanese did not match their high standards of courage and endurance, and they were ignorant of the true meaning of air power.9

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The secret of Allied advance from base to base was their control of communications which the Japanese neglected. Each Japanese base was totally dependent upon sea or air transport reinforcement and did not maintain communication with one another. General George C. Kenney, Commander of the Fifth Air Force, "took out" Japanese base after base by isolating it, cutting its communications and pounding its airfields till all opposition had ceased. "It was the aim of the airforces", he stated, "to create a situation in which land forces could go in with the rifles on their backs".10

The Pacific campaigns of the Allies were carried out by a joint coordination of Navy, Army and Army Air Forces. Even the first strategic bombing of Japan, heralded by the Doolittle raid of 18 April 1942, became possible only because the range of operation of B-25 bombers was extended by the carrier Hornet. Later, many a vital Japanese shipping was successfully interdicted by American submarines. The intermediary islands were wrested out of the Japanese hands at the cost of many marine and foot-soldiers' lives; after

10. Ibid., p.196.
the fiercest of struggles, abounding in blasts, injuries, bloodied encounters and gory deaths. The airforces were having a dominating, though not an exclusive, role in these fights. General James Doolittle while testifying before a Congressional Committee regarding the planned invasion of Japan had remarked: "The navy had the transports to make the invasion possible, the Army had the power to make it successful but the B-29s made it unnecessary".¹¹ The contribution of strategic bombing against Japan is but one important segment of the Allies' Pacific campaign. "The wizardry of technology, the productive capacity of entire nations, and the loyalty and will to fight of the civilian home fronts - these were marshalled in the struggle."¹²

**Japanese Plans**

According to the *United States Strategic Bombing Survey*: "The attack on Pearl Harbor was designed around surprise, the range of carrier task forces, and the power of

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¹² Emme, Ibid., p. 215.
aircraft, to sink surface vessels."¹³ This attack was executed with the loss of 29 Japanese pilots. Two days later, on 9 December 1941 the Japanese sank the British battleship, Prince of Wales, and the battle cruiser Repulse off the coast of Malaya with the loss of four Japanese-Navy medium bombers. Allied air power in the Philippines, Malaya, and the Dutch East Indies was literally eliminated on the ground itself, in a matter of a few days. "The Japanese started the war aware of the fact that a major offensive action cannot be undertaken without local control of the air."

¹⁴ However, the Allies began to see, more clearly than the Japanese, the full scope of the basic requirements for air power. According to the Survey:

Japan's governmental structure provided no effective civilian control of her Army and Navy. In the years between the 1931 invasion of Manchuria and the 1941 attack upon Pearl Harbor the military cliques of Japan exerted a progressively tighter control over the foreign and domestic affairs of the nation. These cliques included groups within both the Army and Navy, but because of the repeated military successes of the Japanese Army in Manchuria and China and the prestige so acquired, and because of the more ambitious and aggressive nature of the Japanese Army leaders, the political position of the Army was ascendant to that of the Navy. The final decision to enter the war and to

¹³. USSBS, Summary Report, n.6, p.1.

¹⁴. Ibid.
advance into the Philippines, the Dutch East Indies, Malaya, Burma and to the southeast was, however, made with the full concurrence and active consent of all important Japanese Army, and Navy leaders and of almost all her important civilian leaders. 15

The Japanese Navy had been gravely concerned about its declining oil supply after the Japan's economic embargo of July 1941, imposed by the United States and Great Britain. The decision to attack Pearl Harbour, according the Survey was based upon the following main considerations:

(a) The Russian threat on the Manchurian flank was neutralized by the German victories in Europe which could lead finally to the collapse of the Soviet Union.

(b) Great Britain was in a defensive posture and was struggling hard to defend her home islands.

(c) The forces which the Allies could deploy in the Pacific in the event of a Japanese onslaught would be insufficient, especially in the Air, while confronting the Japan's fully trained and mobilized forces. This could enable Japan to occupy the entire area within the perimeter comprising of Burma, Sumatra, Java, Northern New Guinea, the Bismarck Archipelago, the Gilbert and Marshall islands, Wake and from there north to the Kuriles.

(d) With the Burma road severed, China would be forced to negotiate.

15. Ibid.
(e) The United States, committed to aid Great Britain, would be weakened by the attack on Pearl Harbour. She would not be able to take to offensive action within a period of one and half to two years. During this period the perimeter could be fortified and required air bases could be built. This perimeter could be backed by a mobile carrier striking force based in Truk.

(f) The defence of the perimeter would not only undermine American support to Allies but would also enable the Japanese to extract raw materials such as bauxite, oil, rubber, and metals from Malaya, Burma, the Philippines, and the Dutch East Indies. Japan could ship these to the home islands in order to strengthen her industrial and military machinery for the war effort.16

The Japanese Army was assigned the primary task of conquering Malaya, Sumatra and Burma. And because of the limited range of Japanese aircraft the initial air support could be provided in northern Luzon only above 16° north latitude. The task of the Navy was to launch operations in the Philippines, Borneo, Celebes, Java, northern New Guinea, the Bismarck Archipelago, Gilbert islands and Wake, in addition to the attack on Pearl Harbour.

The Japanese Army was to take over the control of the Philippines as soon as the landing forces were established

16. Ibid., p.2.
ashore. In these initial engagements, the Japanese were not relying solely upon their volume of air strength although they certainly believed that they had a clear superiority in numbers not only of aeroplanes but in the training and experience of the airmen as well. They relied upon the most important element of war—Surprise. In 1941, the average first line Japanese pilot had about 500-800 flying hours, and about 50 per cent of Japanese Army pilots and 10 per cent of Japanese Navy pilots had acquired actual combat experience in China or in the border skirmishes with the Soviet Union in 1939. The carrier-air-groups were specially trained in shallow-water torpedo drops for the Pearl Harbour attack. And the Japanese Army units were fully trained for the support of ground operations, in Malaya and the Philippines. It has been aptly brought out that—

following the initial successes at Pearl Harbor, Malaya and in the Philippines, Wake, and Guam were occupied in December, and Rebaul in January. The Japanese gained air superiority in Burma with the loss of 102 planes and, with troops specially trained for jungle fighting, occupied that area at a cost of 7000 soldiers killed. At the end of 4 months of war, they had carried out the substance of their initial program and with greater ease than they had foreseen. 17

17. Ibid., p.3.
The Japanese air forces had played a significant and remarkable role in these operations.

American Plans

According to the Survey, it had been decided, even prior to the Japanese attack on Pearl Harbour that in the event of a possible war with Japan, Germany would still be tackled first. The United States was to maintain a defensive role in the Pacific. It was believed that it would be possible to hold to the Malaya barrier and successfully engage the Japanese fleet in the Central Pacific and eventually make an advance against Japan itself. It was later admitted that -

The United States plan had little basis in reality. With the forces then available no adequate plan of defense was possible... To have implemented an adequate plan in December 1941 would have required better intelligence regarding Japanese intentions and capabilities, an earlier understanding of the predominant and indispensable role of air strength and full public support for the necessary appropriations, well before the actual outbreak of war.\footnote{Ibid.}

The Survey has also pointed out "that the loss of relatively antiquated battleships at Pearl Harbor did not
substantially reduce the actual combat capabilities of our Navy of that time as opposed to the Japanese Navy with its superiority in aircraft carriers and battle-line speed." 19

Prior to May 1942 the Americans kept building up their strength in Australia and in the islands lying between Pearl Harbour and Australia while providing resistance through their isolated forces in the Philippines and by sporadic carrier and land based air raids. They concentrated on training and production programmes.

The Japanese attack upon Pearl Harbour appears, in part, to be a strategy to ease Allies' pressure upon Germany and, in part, to assess the degree of American preparedness before initiating Japanese offensive for expansion. In any case, since the Americans did not perceive a direct threat to their homelands, they allowed themselves to be persuaded to deal with Germany primarily, and to harass the Japanese communications, shipping and supply routes on a reduced priority. America had resolved to deal with Japan to avenge itself and it suited Great Britain as it could keep its Asiatic possessions secure from the Japanese tide. Moreover,

19. Ibid., p.4.
American preparations were still inadequate when it became evident to them that the Japanese intended to advance south from the Bismarck Archipelago, and threaten their communications with Australia. Nevertheless, Americans decided to make an attempt to hold on to Port Moresby, a line north of Espiritu Santo, and the Fiji Islands.  

It was sheerly by chance that the Americans came to know about the movement of a group of transports, protected by the Japanese carrier Shoho, accompanied by a covering force including two carriers, on way to occupy Port Moresby in May 1942. By virtue of this piece of intelligence the Americans were able to concentrate at the appropriate point. The Japanese carrier Shoho was sunk by Torpedo-plane and dive-bomber attack. In the ensued air engagement, with the Japanese covering force, Japanese air groups were badly depleted and Americans lost Lexington. The Japanese turned back from Port Moresby to return to Revalul and for the first time Japanese advance had been checked. "The combat in this Battle of the Coral Sea was entirely carrier air action."  

20. Ibid.  
21. Ibid.  

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In June 1942, once again due to an exceptional piece of intelligence, the Americans were able to check a Japanese move towards Midway despite their preponderance of numbers. In this case the Japanese transports were supported by an advanced striking force, including "the most powerful surface forces yet assembled in the war and four of Japan's remaining eight operational carriers. An additional Japanese carrier was in a supporting force farther to the north."\textsuperscript{22} The Americans, on the other hand, had comparatively weaker forces comprising of three carriers, the \textit{Enterprise}, \textit{Yorktown} and \textit{Hornet}, the only ones available for combat action in the Pacific at that time.

The American planes located the Japanese fleet and sank three of the enemy's carriers and so damaged the fourth that it became an easy prey to the American submarines. The Japanese were forced to beat a hasty retreat. Later, the interrogation of surviving officers by the \textit{Survey}, revealed that the Japanese carriers were sunk by American carrier based dive bombers. Americans lost \textit{Yorktown} in this engagement. On the whole, the combat in this engagement was

\textsuperscript{22} Ibid.
also based upon air action. After Midway, the Japanese Navy was greatly hobbled by its increasing weakness in the air.

The scene of intense fighting shifted back to islands south of Rebaul, the seas surrounding them and the air over both. The Japanese had resolved to make all out efforts to capture Port Moresby, if need arose, from the overland routes from the northern shore of New Guinea. They had started constructing airfields in the Solomons. The Joint Chief of Staff of USA ordered a two pronged attack, one from the chain of Solomon islands commencing with Guadalcanal, and the other directed towards northern New Guinea from Port Moresby, with the objective of capturing Rebaul. General Douglas MacArthur and Admiral Robert Ghormley were to ensure the line of communications with Australia and press hard with the attack.

The Japanese landed at Buna on the North Coast of New Guinea opposite Port Moresby on 21 July 1942 and infiltrated the Owen Stanley Range but their lines of communications were cut by the American air attacks. Japanese advance was straffed so much that their attack was checked and effectively pushed back by the Allied ground forces which were air dropped. The Japanese were unable to reinforce
their attack. The Americans made a surprise landing at Guadalcanal on 7 August 1942, backed by the air support from the US carriers. The American Marines quickly captured an under the construction airfield thereat and named it Henderson Field. Japanese attempts to run in reinforcements were defeated by air attacks. They, however, managed to cause, at a great loss to themselves, a substantial damage to the American shipping and shore installations while operating from a chain of airfields between Guadalcanal and Reaul. By the close of 1942, all Japanese attempts to retake Guadalcanal had got petered off and operations to capture Buna were almost complete.

The Allies were now securely established in these critical areas and set out to progressively build up local superiority in the air, ground and sea. The Japanese had suffered heavily. The Allies losses too were great. In fact, the Japanese never fully recovered from these disasters. They had lost many of their best pilots and experienced troops. This was to have an adverse impact upon the subsequent campaigns for the Japanese, and render an advantage to the Allies. The Allies could now hope to advance. But major preparations were required before
decisive advance could be undertaken. According to Sir Robert Saundby: "Realizing the vital part which strategic air bombardment would play in the defeat of Japan, it was intended to capture the bases occupied by Japan, one by one, until the heavy bombers could be brought within range of Japan itself."23

The Japanese fought bitter defensive battles on each island. Fierce air, sea and land battles raged. In the air the Americans were able to inflict heavy losses on the Japanese, because the new Japanese pilots being sent in combat were just not up to the standard of those whom they replaced. On the whole, the "Japanese expansion through the Pacific and Indian Oceans had been extravagant in its wastage of aircraft and aircrews, while Americans had been learning from experience."24

The Japanese industry and its home populations came increasingly within the radius of action and consequently effective striking distance of United States' long range bombers. The strategic positions across the Pacific were to


enable the Americans "to complete the interdiction of Japan's overwater shipping, to mount large scale air attacks against the Japanese home-islands, and to prepare for an invasion of the home-islands themselves."\textsuperscript{25}

It was clearly understood by the Allies that whatever be the shortcomings of Japanese naval, ground and air resources, whatever be superiority of resources which the Allies could bring in to bear upon the Japanese, the soldiers and sailors of Japan would continue to fight until death in their loyalty to the Emperor and in obedience to their officers. And they would exact a fearful price. Therefore, it was thought prudent to employ the air forces not only in direct support of other military operations but also to fulfill an independent role effectively, bypassing the traditional fronts of war; to strike into the enemy's home territory - a perspective which appeared especially attractive to raise the sagging morale of the Chinese.\textsuperscript{26} It was argued by the espousers of strategic bombing concept that bombing might destroy either the capacity of the enemy

\textsuperscript{25} USSBS, Summary Report, n.6, p.6.

\textsuperscript{26} Saundby, n.9, p.199.
to continue fighting by wrecking its industrial facilities deemed essential for the conduct of war, or its will to continue fighting by affecting the morale in its home front, which was, indeed, necessary for the maintenance of the war effort, or to achieve both the aims simultaneously.

The Bombing of Japan

The strategic bombing of Japan commenced on 15 June 1944 when fifty B-29 bombers, flying from bases in China, attacked the Imperial Iron and Steel Works at Yawata, which produced a quarter of Japan's steel. The B-29s returned literally unscathed. The reconnaissance photographs revealed that the target had also not been damaged at all. The attack had to be launched again.

Initially, at the top of the target lists were aircraft plants, steel plants and coking ovens. The B-29s were assigned Showa Steel Works in Manchuria in July 1944. They had to attack it many times. They were also to attack the steel plant at Yawata. The B-29s flew both by day and night and at various altitudes. They bombed visually when the weather permitted and by means of radar when it did not. They attacked an aircraft plant at Okayama during day and
then tried an incendiary raid by night on Nagasaki, without any tangible result. The Twentieth Bomber Command (China) had flown total of forty-nine missions up to 31 March 1945, when it was deactivated. It had air-dropped almost 11,000 tons of bombs, but out of these only 800 tons had fallen on the Japanese home-islands.

In China, although major air bases had been built but the operations from these bases were proving extremely uneconomical and cumbersome. The main problem was that of logistics, as it took almost ten gallons of aviation gasoline to deliver one gallon over the Hump from India to Chengtu air fields. Though the missions flown therefrom had almost inconsequential effects yet they were valuable, primarily for training the air-crews and breaking-in of new aircraft. It was, indeed, a back-breaking way of fighting the air war. There appeared no hope to carry out the kind of campaigns that visionary air planners had desired "but for the Japanese... it was the beginning of the end."27

In order to strike targets in Japan or Manchuria from their home base airfield around Kharagpur, close to

Calcutta, the B-29s had to fly first to air fields around Chengtu in China - a distance of about 1200 miles. At Chengtu, after landing, they had to refuel and take off in order to attack Japanese targets at a distance of 1300 miles. Thus each mission involved almost five thousand miles and more than twenty hours of flying time. Moreover, there had been communication problems as well. The Twentieth Bomber Command personnel often complained of lack of the barest necessities at Chengtu. "Even full Colonels had to walk two miles to their aeroplanes."\(^{28}\)

The American Joint Chiefs had already decided that B-29s were to have less precarious bases. The group of islands of Marianas was the only obvious choice. So, the day the B-29s were attacking the steel works at Yawata, the US Marines were storming Saipan. Even before the island was fully secured the work had begun to cut out enormous airstrips, "each 200 feet in width and 8500 feet long"\(^{29}\) for the impending operations of B-29 Superfortresses.

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29. Caidin, n.27, p.184.
The first raid from Saipan was launched against the Musahi Engine Works in north-west Tokyo. This target designated as 'target No.357' was destined to become the most elusive. In the repeated air raids, the target remained undamaged mainly due to weather conditions. For instance, during the raid of 24 November 1944, there were strong winds at the operative height, and the target below was completely obscured. On 27 November 1944, the B-29s returned overhead Tokyo to find Musahi Works completely covered by clouds, and on 3 December 1944 though the plant was visible yet because of high winds the bombing got scattered. The repeated attacks on the Musahi Works continued. Between November 1944 and May 1945 these attacks cost the Americans a total of fifty-nine B-29 Superfortresses. But the air-crews kept trying relentlessly and, at last, they succeeded.

The problem of bomber operations over Japan was due to extremely high wind velocities, which were as much as 200 knots at 25,000-30,000 feet height; the normal operating altitude of B-29 bombers. Due to high wind velocities it resulted in drift which was difficult to correct and bombing runs had to be charted directly upwind or downwind. Attacking Japan's best defended cities directly in the face of a 200-knot wind was unthinkable but it had to be done.
When going downwind the B-29s would reach ground speeds in excess of 500 miles per hour, in which case neither bombsights nor bombardiers could function properly. Moreover, the high winds made it impossible for crews to make a second pass if the run-in failed. "If a navigational error brought a plane in downwind from target, it most of times was not able to attack at all."\textsuperscript{30}

General Hap Arnold, the Chief of the Army Air Forces, was particularly unhappy with this sort of situation wherein the chosen targets were outliving the attempts by precision bombing. At the same time Arnold's Committee of Operations Analysts' had pursued its investigations into incendiary raids to the point of building models of Japanese structures and testing their flammability. For elaborate data and ideas, the Offices of Strategic Services, Foreign Economic Administration, Air Staff Intelligence, Army G-2, and British Ministry of Economic Warfare, had been consulted by the Committee. "Since the Japanese had done a good job of concealing important data about their economy, particularly industries contributing to their war effort"\textsuperscript{31}, reliable

\textsuperscript{30} Craven and Cate, n.28, p.576.

\textsuperscript{31} Schaffer, n.7, p.111.
information was difficult to come across. Americans did not even know where some of the important installations were at this stage of war and good aerial reconnaissance photographs were almost impossible to come by.

The Committee of Operations Analysts proposed several Japanese cities for incendiary attacks and General Arnold sent out instructions in November 1944 to conduct a test raid. General Haywood S. Hansell was averse to this kind of bombing. He, however, did launch a small and inconsequential raid on the night of 29-30 November 1944.32 But when he got further instructions to mount a full-scale incendiary attack against Nagoya, using one hundred B-29 bombers, he protested. Nevertheless, he dispatched his bombers on to Nagoya on the night of 3 January 1945. The raid was inconclusive; bad weather hindered reconnaissance sorties also for any photographic evidence. "The ineffectiveness of so many of Hansell's operations stretched General Arnold's patience and strengthened the position of those in AAF headquarters who wanted to start burning the Japanese cities at once."33

32. Ibid., pp.119-22.
33. Ibid., p.124.
The official history of the Army Air Forces indicates strongly that Hansell's preference for precision bombing cost him his job. Hansell sent long explanations of the problems, but it did him no good. He was replaced on 20 January 1945 by General Curtis E. LeMay who did not have the same degree of commitment to ideology. LeMay was, indeed, a hard driving, battle-tested, and a ruthless veteran of the European theatre. General Hansell, despite his close association with high level planning throughout the war had probably failed to recognise a basic change of attitude that had taken place in Washington. The change reflected a growing hope, particularly amongst airmen, that some way may be found to bring adequate pressure upon Japan through burning the Japanese cities before the planned invasion.

General LeMay initially did not make any radical changes in the operations. At first, he continued the same type of high altitude daylight precision raids, against the aircraft plants, that were now becoming familiar to his airmen. But simultaneously he resorted to increased experimentation with incendiary attacks, with which he had already some experience while heading the Twentieth Bomber Command in China. He had succeeded in burning much of Hankow
in December 1944 and now he hoped to achieve better results in mainland Japan.

The comparative centralization of Japanese industries in a few major cities, the high proportion of wooden and other inflammable building materials, the disappointing results of precision attacks, and the determination to subject the Japanese to the maximum possible destruction as compared to the Germans, combined to produce a situation ripe enough for the introduction of incendiaries in bombing raids. So, when it was recommended to LeMay that Kobe, Japan's sixth largest city, should be experimented upon with incendiary bombings he, on 4 February 1945, promptly dispatched sixty-nine B-29 bombers. They dropped nearly 160 tons of incendiaries on the city's highly inflammable residential areas and on the adjacent factories and also on the commercial districts, interspersing the incendiary bombs with several tons of fragmentation bombs so as to discourage fire fighting efforts. "Reconnaissance photographs showed severe damage to the industrial area."34

34. Ibid., p.125.
The intensive air attacks on the Japanese, that marked the later stages of the war, began only in March 1945, at which time some radically new tactics worked out in General Curtis LeMay's headquarters were introduced. "These tactics involved 'maximum effort' low level attacks at night, with great compression of force in space and time." LeMay had made basic changes in B-29 operations, and in those changes he had staked his career. It was a fact, that even in the three months after LeMay's having been at the helm of affairs, the bombing force had not justified its existence by striking blows which could have made the Japanese wilt. In three months of operations the bombers had delivered down 7000 tons of bombs, half of the sorties had ended with the bombers unable to attack the primary targets. The obvious course was to drop more bombs and for a 'telling effect'.

LeMay realized that massive incendiary night raids would have to be carried out against the cities of Japan. This could offer several advantages. First, the specific targets for which so much effort was being expended, were, after all within an urban matrix. So, when a city would be

put to flames, the arsenal or factory would also be burnt in it. The Japanese cities were highly vulnerable to fire. Secondly, attack on a city by incendiaries could be effectively conducted even in an adverse weather without locating the target visually or by radar because 95 per cent of the city structures were inflammable. Thirdly, the night attacks were to be advantageous in the sense that the Japanese defences were not as formidable during the nights as they were in Germany. The Japanese night-fighter was still in its infancy and lacked airborne radar. Moreover, the Japanese flak was not awesome at night. This offered an added advantage so that the night raiders could hope to operate as low as 5000 feet LeMay's further gamble was stripping off B-29s of guns and ammunitions so that extra bombs might be carried at low altitudes.

LeMay, with Arnold's approval, decided to adopt incendiary attacks at night with a logic that the weather over Japan tended to be less cloudy at night, and radio-aids to navigation worked better during the hours of darkness. 36

The low level bombing raids could have posed certain hazards as well. In Europe, it had certainly proved tremendously expensive to the attackers. But from the reconnaissance photographs and information gathered from the test raids, it was estimated that the enemy did not have the right kind of anti-aircraft artillery or even search lights so as to be able to cause any harm to the US planes, especially if they flew singly rather than in formation. The expected results might justify the risk. "The invasion of Okinawa was only three weeks off. The change in bombing tactics would inaugurate a new bombing offensive preparatory to the next great landing operation."

The first massive night incendiary raid was dispatched against Tokyo on the night of 9-10th March 1945. This raid comprising of 334 B-29s was to burn down Tokyo. The key to the success of this raid was to be the saturation and right concentration of incendiary bombings as Air Marshall Sir Arthur Harris had proved over Hamburg. The bombers in this raid, carried 2000 tons of bombs, majority of these being incendiaries. The average load per aircraft was closer to

37. Ibid., p.870.
six tons than the three it had normally been. In this raid the first two path-finder planes passed over the city shortly after midnight to mark the target area: a rectangle measuring approximately four-by-three miles of the most built-up part of Tokyo or roughly 1.25 million people. They dropped over the heart of Tokyo napalm-filled M-47 bombs at 12.15 a.m. One hundred feet above the ground level the M-47 missiles split apart, scattering two feet-long napalm sticks which burst into flames on impact, spreading jellied fire. In minutes X was etched in downtown Tokyo. Ten more path-finders roared in to drop their napalm on the X. Then came the main force, three wings, in orderly but random formation, at altitudes varying from 4900 to 9200 feet. Searchlights poked frantically at the raiders, and puffs of anti-aircraft fire detonated and relumed without effect. There was no fighter opposition. According to Toland:

Whipped by a stiffening wind, the fires spread rapidly as succeeding bombers fanned out toward the residential areas to unload their thousands of sticks of napalm. Flame fed upon flame, creating a sweeping conflagration. Huge balls of fire leaped from building to building with hurricane force, creating an incandescent tidal wave exceeding 1800 degrees Fahrenheit.38

38. Toland, n.1, p.673.
Tokyo was a sea of flames. The tail-gunners in the returning B-29 bombers could see the glow of burning city as far as 150 miles away. The results of this raid exceeded all expectations. "Almost sixteen square miles of the city got burnt out, including 18 per cent of the industrial area, 63 per cent of the commercial area, and the heart of the residential district. Between 80,000 to 100,000 persons died in flames. A new stage of the air war had begun against Japan."\(^3\)

Several factors combined to make this raid by the incendiaries, particularly successful. The Japanese had not anticipated in their Air Defence or Fire Fighting Plans this kind of wholesale city-fires. They had no foreboding of this incinerative eventuality. Martin Caidin has rightly pointed out that "for the Japanese it was Akakaze or the Red wind, blowing across Tokyo, that took flames with it. There was no true fire-storm over Tokyo that night, the potential storm was transformed into an even deadlier force - the sweep conflagration."\(^4\)

The damage was so atrocious that Emperor

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Hirohito was impelled to personally inspect the tremendous damage.41

Two days after the Tokyo raid, Nagoya was struck, applying essentially the same technique, and Osaka and Kobe were also similarly lit. In these cities, modern buildings of stone and concrete withstood somewhat better than Tokyo's tinderbox buildings, but enormous areas were destroyed, along with industrial facilities. Docks and shipyards were devastated along with residential districts. The German naval attache in Japan sent out a dispatch to his Government stating that these raids were amazingly effective and that the subsequent air raids which followed were far more devastating than had been feared. They were crippling the Japanese industry. Within a ten-day period beginning from 9 March, the Allied bombers dropped 9,373 tons of bombs and burned out 31 square miles of the city areas. The plight of the Japanese empire, by the time this campaign began, is summarized by the Survey as follows:

By March 1945, prior to heavy direct air attack on the Japanese home islands, the Japanese air forces had been reduced to Kamikaze forces, her fleet had been sunk or

immobilized, her merchant marine decimated, large portions of her ground forces isolated, and the strangulation of her economy well begun.  

Moreover, by this time, the Japanese had already lost the Philippines and Iwo Jima and were suffering the investment of Okinawa. They were not able to send any tangible supplies to their fighting forces outside their home islands. They had to concentrate increasingly on a defence against the invasion. How long they would have continued to withstand all this, even in the absence of Allies' strategic bombing campaign, is debatable because "the blockade resulting from destruction of the Japanese merchant marine had, among other things, brought the national diet to below subsistence level."  

The Tokyo fire raid, "the most devastating air attack in the Japanese history, not excluding the attacks on Hiroshima and Nagasaki, later, became the pattern for the remaining operations of Twenty-first Bomber Command."  

42. USSBS, Summary Report, n.6, p.9.  
43. Brodie, n.35, p.128.  
44. Craven and Cate, n.28, pp.645-53.
an ease of expediency the American Air Forces embraced, in
the last stages of the Pacific War, as Weinberg observes:

the concept of area attacks which it had so long
opposed in Europe, where it had for years been
advocated and practised by the Royal Air Force. In the
face of a series of ever bloodier battles at the front,
there were few if any qualms about launching a rain of
death on Japan's cities, which now experienced what the
Japanese air force had first visited on China, and
which the Japanese balloon operation had been designed
to do on an even larger scale to Canada and the United
States.\textsuperscript{45}

Curtis E. LeMay's team had endeavoured to make the
Japanese city-burning as something of a 'science'. LeMay was
relentlessly launching his incendiary raids so much so that
often there arose a shortage of incendiary bombs in his
ammunition depots, which had to be replenished quickly
otherwise missions could not go on. He experimented with
different weapons as well as operational techniques. For
instance, he utilized the M-50 thermite incendiaries. The
characteristic operational feature of this incendiary bomb
was that it could penetrate the built up structures. It
would pierce through the Japanese structures and ignite in
the earth beneath them. However, the most utilized weapon

\textsuperscript{45} Weinberg, n.36, pp.870-71.
was M-69, a small incendiary bomb, many of which were dropped in a single casting and in clusters. According to William B. Sinclair:

Each of these clusters, arranged to explode at 2500 ft altitude, was constructed to release thirty eight incendiary bombs, made to fall in a random pattern, this arrangement furnishing the basis for big bombing success to come. The orderly design or distribution from one bomber with an intervalometer setting, or spaced fall, of one bomb every feet, could burn about sixteen acres, as each superfortress had a full bomb load of 16,000 pounds. 46

The destruction in Japanese cities was most exhaustive by such burning methods. The situation for the Japanese was turning utterly grim due to scarcity of resources and such raids as that of 9-10 March helped drive home the point to the Japanese that even their homes were highly vulnerable. Coupled with other military disasters, like the fall of Saipan, many Japanese leaders had begun to understand their country's quandary. But it did not bring the morale of the Japanese civilian population to a breaking point. 47 And this was not altogether unexpected by the Americans.


After March 1945, the B-29 bombers attacked Tokyo again and again, systematically destroying its undamaged areas. Thousands of tons of incendiaries were dropped on the northern parts of the city and in the areas along the Tokyo Bay in April 1945. In May 1945, the central and western parts of the city were struck. During these raids the fire-storms, caused due to winds, burned down the homes of about 570,000 people. Such incendiary attacks were simultaneously launched upon the cities of Nagoya, Osaka, Kobe and Yokohama.

The astounding success of the incendiary raids, upon the Japanese cities, marked the ultimate demise of the pre-war theory of precision-bombardment. The grim logic of victory by all means, prevailed over those who had sought some surgically precise method for the application of force. Now "thousands of tons of incendiaries were heaped on Japanese cities and the most vigorous advocates of the fire attacks were fire protection engineers as they preferred to call themselves."48

Some of the reasons for such relentless incendiary bombings appear to be that firstly, in Europe the early dreams of victory through air power had been dashed, and now Japan had provided another unmistakable opportunity. Secondly, by the end of June 1945 the dominant feeling at the AAF Headquarters was that the Japanese might be induced to surrender before the invasion planned for November. And thirdly, the votaries of an independent air force wished to make a strong case for themselves after the war.

Nevertheless, the incendiary area raids did adversely affect Japan's overall economy. They were gradually diminishing the ability of the Japanese forces to resist an invasion of their home-islands. But, such raids appear to be onslaughts on civilian populace only. Ronald Schaffer has also observed:

the tinderbox theory - that firebombing residential districts would ignite industrial concentrations - had generally proved incorrect. The most flammable zones did not contain the most important war plants and some of the workshops and factories that were destroyed could not have contributed to the Japanese military effort in any case, since American attacks on transportation had shut off their supplies and made it impossible to ship what they produced. While area raids set back production for a while, they could not

49. Craven and Cate, n.28, pp. 626-7.
interfere quickly and decisively with Japan's ability to fight - which meant that despite all the damage the fire raids had done, Allied troops could anticipate severe casualties if they landed on the Japanese main islands.\textsuperscript{50}

In any case, LeMay was sure that if he pushed the Twenty-First Bomber Command to its limits, within six months, he could destroy Japan's capacity to wage war. He was of the firm belief that the incendiary was the logical weapon and there was also the matter of will to fight, which the Air Force doctrine had long maintained must be destroyed along with ability to make war. In the battles of the Pacific islands the Japanese troops fought bitterly and preferred committing suicide to surrender, suggesting unequivocally that it would not be an easy task to make Japan surrender on ground battles, so LeMay and the like further felt that air power could only do it. Therefore, they directed a number of heavy incendiary attacks, against the six great industrial cities of Japan - Tokyo, Nagoya, Osaka, Kobe, Yokohama, and Kawasaki - with so much ferocity that there lurked in every Japanese mind an "aweful terror of the great fire raids on their cities."\textsuperscript{51}

\textsuperscript{50} Schaffer, n.7, p.137.

\textsuperscript{51} Brodie, n.35, p.131.
The strategic bombing of Japanese home islands was not without interruptions. After Formosa had been effectively neutralized by air attacks and mine-laying, the American Marines had to press further for the capture of Okinawa - the largest island in the Ryukyu chain - only about 350 miles from the mainland of Japan. So, between 17 April 1945 and 11 May 1945 more than 75 per cent of the total effort of the Twenty-First Bomber Command had to be devoted to support the Okinawa campaign. Every available aircraft, including B-29s, was marshalled to assist the American ground and sea forces who had put 60,000 men ashore by the first week of April 1945. There were 1900 Kamikaze attacks by the Japanese against the Allied shipping scoring 182 direct hits thereby sinking more than twenty-five ships. Moreover, the surface troops had to fight almost every inch assisted by air effort. Whatasoever, by 12 May 1945 LeMay's Command was relieved of this task and it resumed the incendiary raid of the six great industrial cities and by 15 June 1945 the targets in these cities were almost ruins.52

52. Saundby, n. 9, pp.218-19.
The attacks had a dual function of reducing the enemy's ability to resist both physically as well as psychologically. After Okinawa had been captured, the B-29s continued to bring destruction on to the Japanese cities and the Okinawa-based fighters and medium bombers brought it to Japanese hamlets and countryside. They were ranging over Japan as they had ranged earlier over the expiring German Reich; attacking trains, bridges, and whatever targets of opportunity presented themselves. Such operations deliberately blurred distinction between military and civilian objectives. The American pilots strafed Japanese civilians even in their fields and on the roads under a rationale that since Japan was mobilizing the people to resist the invasion, the entire population of Japan was a proper military target.53 Exhaustive programmes were adopted to put the Japanese cities to extensive fires to dehouse their denizens and to starve the common populace by denying them food supply through naval blockade and also by destroying their rice crop by chemical defoliant TN-8.54

53. Craven and Cate, n.28, p.696.
54. Schaffer, n.7, p.139.
means were considered fair and justifiable in order to achieve the aim of a capitulation of Japan. "In Japan, unlike Germany, the urban area-bombing seems to have contributed more to achieving the desired results than did the precision bombing of specific industries."55 And in reality, "Japan had already lost the battle of production; her economy had already proved grossly inadequate to the political and strategic ambitions of her leaders".56 The mainland of Japan, was almost isolated from its main sources of supply, and it suffered terribly from the effects of air bombardment. But for the Americans the problem was still there as to how to end the war quickly, humanely and economically!

But the exceptional ferocity and strong determination shown by the Japanese in their efforts to defend Iwo Jima and Okinawa, and the sudden "increase in the number of Kamikaze attacks, encouraged the belief that the final assault of Japan would be inconceivably bloody and bitter".57 In order to denigrate the Japanese will-power the

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55. Brodie, n.35, p.130.
56. Ibid.
57. Saundby, n.9, pp.219-20.
Combined Chiefs of Staff in May 1945, had adopted a programme to create doubt, confusion, hopelessness, and defeatism amongst Japan’s civilian and military personnel, and to alienate the Japanese citizens from their government. In support of this plan General LeMay had inaugurated a series of morale-shattering attacks, describing them as powerful psychological weapons which could be used to convince the Japanese and certain articulate minority groups in the United States that the air force policy was, indeed, to destroy Japan’s war-making industries and not the people of Japan. 58

Whereas, LeMay’s team was trying to make the Japanese city-burning a ‘science’ the Japanese were quickly transmuting this fiery routine into a kind of ‘art’ for themselves to be lived through courageously. But the Allies knew as much as the Japanese themselves that Japan was already almost defeated. But it was necessary to develop a clear consensus on that fact, so that Japanese could openly concede it. For such an aim a campaign, commencing from

27 July 1945, was launched, wherein American aircraft dropped 60,000 leaflets, on each of the eleven major cities forewarning the Japanese that some of their cities would be destroyed. On 28 July 1945 six of their cities were firebombed by 471 Superfortresses. Again, on 31 July 1945, twelve cities were warned and were firebombed on 1 August 1945. On 4 August 1945, another group of cities got the leaflet warnings followed by a heavy shower of incendiary bombs.

The potential of the strategic air offensive had appeared perhaps greater than its achievement. There were some Air Force officers who openly espoused violence without restraint declaring that -

We military men do not pull punches or put on Sunday School picnics. We are making war and making it in the all-out fashion which saves American lives, shortens the agony which War is and seeks to bring about an enduring peace. We intend to seek out and destroy the enemy wherever he or she is, in the greatest possible numbers, in the shortest possible time.59

General LeMay had also believed that "it was (politically) immoral to use less force than was necessary to achieve a military objective when adequate force was available."60

60. Ibid., p.212.
Both the principle of selective bombing with which the AAF had entered the war and its practice of area incendiary bombings had proved that Americans could go on to any lengths to make the Japanese feel helpless and miserable. They were, indeed, "able to reduce Japan more economically than Germany"\(^61\) by the use of exclusive incendiaries. The Japanese were of the view that "through skill in science, the enemy had developed materially, but without morality or true godliness, and this could no longer be tolerated."\(^62\)

The tactic of bombing Japanese cities with incendiaries, first employed in March's air raid on Tokyo, was naturally presented as conclusive proof of the 'inhuman' nature of the enemy.\(^63\)

The memory of World War II seems to have led some Air force leaders to feel that all-out annihilation war was the sole tradition of America's armed forces.\(^64\) There was also a sense of omnipotence accompanying the inclination to wage a

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61. Caidin, n.27, p.190.
63. Ibid.
64. Schaffer, n.7, p.215.
kind of total war which is evident from phrases like - "Then we burned Tokyo, not just military targets, but we set out to wipe out the place indiscriminately."  

**Impact of the Bombings**

Sir Charles Webster and Noble Frankland had defined Strategic Bombing as a means of direct attack on the enemy state with the object of depriving it of the means or the will to continue war. The definition enshrines the *sine qua non* of the heavy bomber, its ability to pass over the obstacles offered by an enemy's armies and fleets and deliver a blow to its vitals. In fact, "it had taken one B-29 and eleven dead men to wipe out each 35 square miles of Japanese cities with population of less than 100,000 and the B-29s with or without Atom bomb could have burned Japan out of war."  

By the end of July 1945, some ninety large and small, Japanese cities had become ash-filled deserts. Industry was strangled, with hundreds of millions of square feet of factory area destroyed. Hundreds of undamaged plants

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66. Caidin, n.27, pp.183-94.
which had been ignored by the B-29s stood just useless; denied the materials and tools with which to work, and abandoned by their labourers who had fled to the hills in the terror of future air raids.

In totality, it appeared as if a great torch had been applied to Japan. The results could have been appreciated only by seeing the mile after mile of blackened cinders, by smelling the horrifying mounds of charred and bloated dead. "It was, indeed, a terrible punishment which, in five months of concentrated strategic air attack, had dealt Japan a mortal blow."67 According to the Survey:

US War planes bombed Japan's sixty-six largest cities, destroying an average of 43 per cent of built-up areas. They forced 8,500,000 people, about a fourth of the country's urban population, to leave their communities. They damaged or destroyed roughly 2,300,000 homes, left an estimated 330,000 to 900,000 civilians dead and 475,000 to 1,300,000 injured. Strategic bombing severely reduced Japan's military capacity, largely by dislocating the Japanese economic system.68

Almost all the major cities in Japan were affected badly by the strategic bombings except the city of Kyoto.

67. Ibid.

The target cities were divided into zones or urban areas which were designated as UA-1, UA-2 and so on. When the requisite number of these zones in a city were destroyed the city was put off the target list. There was hardly anything which the Japanese government could do to save its cities from incineration. Japan's early warning system was not able to cope up with hordes of B-29s and all hopes were pinned upon Passive Air Defence to reduce the effectiveness of enemy's attacks. The Japanese had commenced evacuation of young children from the urban areas beginning in June 1944 and finally when there remained no doubt that the prime targets were cities and towns only, they started evacuating other groups as well. Despite the continued loss of industrial capacity with the incendiary bombings of cities, the government did not order the dispersal and relocation of critical industries until the last stages of the war. There was no respite in the air attacks and the bombing offensive kept increasing its intensity. In March 1945, the tonnage of bombings was 13,000, in July 1945, it was 42,000 and it was expected to be about 100,000 tons in due course.

General LeMay did not abandon the strategic bombing concept. If the weather was favourable his bombers carried
high explosives to specific targets and if it was unfavourable for precise strike operations then area incendiary bombings were resorted to which turned out to be mostly the case. The Japanese experienced increased paucity of resources both of their trained man-power and weapons, with the general intensification and escalation of conflict. They did not have new weapons to be used. The fabled Shusui Jet fighter which had the capability to climb to thirty thousand feet in just four minutes and which could have encountered the B-29s' menace was too late to be of any use. In daily worsening situations only supreme sacrifice could have provided the incomplete solution to the problem and perhaps it could only rekindle the hope of dwindling enthusiasm. On popular voluntary suggestions the authorities had ordered an extravagant but calculated expenditure of human lives in the form of Kamikaze weapons - piloted, rocket-powered flying bombs which were launched from the belly of medium or heavy bombers.

Kamikaze aircraft attacks became such a nuisance and menace for the Americans that General LeMay had to devote all his energies in order to neutralize the Kyusliu airfields from which such missions were originating. The
Americans were taking a heavy toll of the Japanese fighting men who were not only wrung of their basic necessities for carrying on their defensive strife but quite often of their lives also. The Japanese government initiated, in order to make up the loss of fighting elements, the formation of People's Volunteer Corps to fully commit Japan's all adult population to the defence of its home islands. The Americans continued to bomb the civilians now on the pretext that in view of the general mobilisation announced by Japan the civilians were proper targets as they were military men in the making.

Devastated by the strategic bombings but with its will still unslighted, Japan could not effectively wage war nor protect its people. "Unquestionably, the Japanese could have continued to resist"69, killing thousands of raiding Americans and in the process losing thousands of their own, "but the potency of enemy air offensive convinced the Japanese that defence against it was impossible and resistance futile."70 The physical destruction, resulting


70. Ibid.
from the air attack on Japan, approximated that suffered by Germany, even though tonnage of bombs dropped was smaller. 71 Professor Brodie has observed that "the bombing of urban areas in Japan was both more concentrated in time and more intense than in Germany, and it resulted in a higher incidence of both physical destruction and casualties." 72 In aggregate, "some 40 per cent of the built-up areas of the 66 cities attacked was destroyed. Approximately, 30 per cent of the entire urban population of Japan lost their homes and many of their possessions." 73 Industrial plants were heavily damaged because of saturation attacks with high explosives. The destruction in Japan was generally more complete than in Germany. Plants, specifically attacked with high explosive bombs, were, however, limited in number.

Great damage was also inflicted on the local transport facilities which seriously disrupted the movement of supplies within and between the cities. This hindered production, dispersal and repair operations and interfered

71. USSBS, Summary Report, n.6, p.17.
73. USSBS, Summary Report, n.6, p.17.
with the transportation of bare necessities from one place to another, causing hardships and starvations. Surprisingly, the railroad system was not subjected to substantial attack and remained in reasonably good operative conditions.\textsuperscript{74} The incendiary attacks eliminated completely the smaller commercial industrial and residential structures. However, the more substantially constructed office buildings and factories as well as the underground utilities survived. "By 1944 the Japanese had almost eliminated home industry in their war economy."\textsuperscript{75} However, there remained many industrial plants employing less than 250 workers, for subcontracted parts and equipment, for the war economy. Many of such plants were concentrated in Tokyo only and they contributed to almost 50 per cent of the total industrial output of the city. Such plants suffered heavily from the incendiary attacks.

The strategic bombings destroyed 470,000 barrels of oil and oil products, two billion square yards of textiles and 221,000 tons of foodstuffs. The economic consequences of the physical damage wrought by air attacks resulted in the

\textsuperscript{74} Ibid.

\textsuperscript{75} Ibid., p.18.
declining health, vigour and resistance of the Japanese people.\textsuperscript{76} The air attacks interdicted import of raw materials which affected production and resulted in the paucity of bare necessities for the common people. In July 1945, the last full month before Japanese surrender, electric power and coal consumption were both almost exactly 50 per cent of the peak reached in 1944. The Japanese electric power system was particularly subjected to specific attacks. Production declined to 44 per cent of 1944 peak. Output of air-frames was reduced to 44 per cent, aircraft engines were reduced to 25 per cent, ship-building to 25 per cent, army ordnance to 45 per cent and naval ordnance to 43 per cent of the 1944 peak. Oil refining had declined to less than 15 per cent of 1943 output. Primary aluminum production was reduced to 9 per cent of the 1944 peak. The nitric acid production declined to about 17 per cent and explosive production to 45 per cent of the 1944 peak.\textsuperscript{77}

The overall outputs capacities were reduced because of physical damage to industrial plants either due to area or

\textsuperscript{76} Ibid.
\textsuperscript{77} Ibid.
precision attacks, besides the decline in production consequent to the dispersal forced by the fear of further physical damage. The oil refineries' output was reduced to 83 per cent, aircraft engine's plants to 75 per cent, airframe plants' to 60 per cent, electronic and communication equipment to 70 per cent, army ordnance plants to 30 per cent, naval ordnance plants to 28 per cent, merchant and naval shipyards to 15 per cent, light metals to 35 per cent, ingot steel to 15 per cent and chemicals to 10 per cent. 78

The movement of people caused by strategic bombings did not come to a halt even after the war. Millions had been displaced as refugees or deportees and many of them found it difficult or impossible to get back to their homes as the destruction caused was so extensive that there were truly no houses or huts left intact to be called as homes. The Japanese labour force declined in efficiency due to malnutrition and fatigue. Many production hours were lost because of air-raid alerts, sickness, absenteeism and enforced idleness. The production hours lost rose to 40 per

78. Ibid. (These are the percentages of pre-attack figures).
cent in July 1945 as compared to 20 per cent in 1944. The production suffered also because of the fact that skilled personnel were drafted into the armed services. The Survey has observed:

Most of the oil refineries were out of oil, the alumina plants out of bauxite, the steel mills lacking in ore and coke, and the munition plants low in steel and aluminum. Japan's economy was in large measure being destroyed twice over, once by cutting off exports, and secondly by air attack.\(^{79}\)

Japan, with its major cities largely destroyed, was in a desperate condition. Much of Japan's coastal and inter-island traffic had already been forced on its inadequate railroads. There were adverse economic effects upon the Japanese people and their determination to continue the war. Though in the rain of explosive and incendiary bombings the Japanese armed forces had lost their ability to protect the people yet they did not lose their confidence and determination to continue the war. The apathy of the Japanese people to their miserable surroundings was partially attributed to "Buddhist fatalism".\(^{80}\) Moreover, the

\(^{79}\) Ibid., p.19.

Japanese authorities had catered for the worst eventualities and the common people had full faith in their Emperor, despite the myriad leaflets of propaganda being dropped by the Allies prior to the hurling down of incendiary and explosive bombs. The Survey Reports tend to assign great significance to strategic bombings' role in weakening the Japanese economy.

The total casualties due to strategic bombing probably exceeded Japan's combat casualties which the "Japanese estimate as having totalled approximately 780,000 during the entire war." The main cause for the civilian deaths or injuries was burns. For example, in the Tokyo raid of 9/10 March 1945, approximately 185,000 persons suffered deaths. The attacks on other cities did not produce such gruesome figures. In an attack lasting less than one hour 47 per cent of the city of Yokohama was destroyed, and there were 5,000 deaths. In order to save their population from the air attacks the Japanese authorities had made whatsoever arrangements they could. They had constructed firebreaks by tearing down all houses along the line of selected streets

81. USSBS, Summary Report, n.6, p. 20.
or natural barriers. The total number of buildings torn down for such purposes was 615,000. The firebreaks provided avenues of escape for the civilian population but could not effectively stop the spread of fires as the American bombers dropped incendiaries purposely on both the sides of the firebreaks where civilians sought shelter. According to the Survey 2,510,000 Japanese buildings were destroyed by the American air raids.

Japan's civilian defence organization was simply overwhelmed with the number of enemy air-raid attacks. Though the authorities had undertaken effective steps for minimizing the risks to their civilian population by providing air-raid shelters, yet due to shortage of steel, concrete and other construction material, it became increasingly impossible to provide useful shelters. Each family tried to fend for itself by crouching in the dug out pits covered with bamboos and the like. Wherever, topography permitted, tunnels were also dug into the side of the hills so that many families could seek shelter together. But such a rudimentary planning of civilian defence against incessant explosive and incendiary attacks could not be expected to provide meaningful safety, yet it did minimise casualties.
School children and the aged had been evacuated to rural areas. All able-bodied personnel were organized into firefighting groups. But they were unable to cope up with the heavy weight of the bombing attacks.

People received meagre rations. Their diet suffered. The average per capita calories intake was reduced to 1680 calories per day in 1945 from that of 1900 calories of 1944. Coal-miners and heavy industrial workers, of course, received higher than average starving-person's rations. The incidence of diseases such as beriberi and the tuberculosis increased and there was adverse impact on the general efficiency and morale of the people but even then the great Yamato-spirit of the Japanese people, and their willingness to make personal sacrifices, including that of life itself for their Emperor or Japan was unaffected.

According to Brodie "there were mass migrations from the cities. During the American air campaign, some eight and one-half million Japanese left their homes." The American bombers flew over the Japanese skies dropping bombs,

82. Ibid, pp.20-21.
leaflets and to take photographs of the bomb-caused-ruins below. There was no significant opposition from the Japanese. The Survey indicates that people lost faith progressively both in their military and civilian leadership, and also in Japan's fabled military might. In short, due to incessant bombings both precision and area, incendiary and explosive, the Japanese military lost its purpose and people started thinking about the futility of their struggle when Japan could not hope to achieve victory. "People became short tempered and more outspoken in their criticism of the government, the war and affairs in general."\textsuperscript{84} But they could have still passively faced death in the continuation of even hopeless struggle, had their Emperor so ordered.

The bombing of Japan was carried out not only with explosives and incendiaries but with leaflets as well. It was a war waged "not only with weapons but also with words."\textsuperscript{85} Strict censorship had been imposed by the Japanese authorities. The measures adopted were directed mainly towards the perpetuation of public confidence and achieving

\textsuperscript{84} USSBS, Summary Report, n.6., p.21.

\textsuperscript{85} Weinberg, n.36, p.581.
military discipline. Attempts were made to provide justifiable reasons for the continuation of the war and retain confidence in victory by means of films, news releases, posters, radio programmes, and other mass media apparatuses. Whatever were the problems, the patriotic themes helped in bearing, if not overcoming, the mounting difficulties and they negated, to some extent, the subversion likely from enemy's propaganda and psychological warfare.

The theorists of air power and the proponents of strategic bombing had argued that aerial bombings could "destroy either the capacity of the enemy to continue fighting by wrecking his industrial facilities, essential for the conduct of war, or the will to continue fighting by destroying the morale of his home front, which was equally necessary for the maintenance of a war effort or to do so both simultaneously." But in actual practice, the early days of the strategic bomber campaign to burn Japan out of the war were easily some of the most frustrating in the

87. Weinberg, n.36, p.575.
history of the American Air Forces. Even when B-29 Superfortresses arrived on the scene and got suitable operating bases also, and managed to burn down "her 69 cities and 178 square miles into wasteland of ash rubble," and by the end of July 1945, having converted some ninety large and small Japanese cities into smouldering deserts, the Japanese had neither given up fighting nor exhibited symptoms of a destroyed morale. Their Industry was strangled, with hundreds of millions square feet of factory area destroyed, and many more hundreds of their industrial plants which were left unscathed by the bombings by the factors of chance and weather were idle for lack of raw materials which could not be brought from parts of Asia due to blockade, the raw materials without which Japan was unable to go on fighting, but Japan was still fighting with its back to the wall.

88. Caidin, n.27, p.142.
89. Ibid., p.170.