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# Improvised Destruction: Arnold, LeMay, and the Firebombing of Japan

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The area firebombing campaign waged against the cities of Japan in the waning months of the Second World War represented a stunning departure from early-war American bombing strategy. This policy evolved from the relationship between the USAAF commander, General Henry Arnold, and his subordinates in the field. Arnold had grown to trust a young field commander, Major General Curtis LeMay, so much that he sent him to bomb Japan with just one criterion – get results. Arnold needed these immediate, eye-catching results because they would provide benefits for the service well beyond simply beating Japan. There was little systematic and nothing pre-ordained about the course of the campaign, made possible because the most senior leaders abrogated their responsibility to oversee and perhaps check the incendiary campaign and the destruction and death that accompanied it.

‘I had to do something.’<sup>1</sup>

General Curtis E. LeMay

On the night of 9 March 1945, 325 B-29 ‘Superfortresses’, based in the Marianas and under the command of Major General Curtis E. LeMay, dropped 1665 tons of bombs, all of which were incendiaries, on the heart of residential Tokyo. The bombs generated a ferocious, unstoppable firestorm that consumed 15.8 square miles of the city and killed a roughly estimated 100 000 of its citizens. The targeted residential zone bordered a large manufacturing sector of the city: consequently 22 numbered industrial targets were destroyed and struck from the target list the next morning. By official Japanese estimates, 267 171 buildings were levelled (one-quarter of the city), and 1 008 005 Japanese were left homeless.<sup>2</sup> Viewed as a massive success by the United States Army Air Forces (USAAF), the Tokyo raid kicked off a firebombing campaign

<sup>1</sup> Interview with Curtis LeMay, March 1970, Air Force Historical Research Agency, Maxwell Air Force Base, Alabama, roll 43824.

<sup>2</sup> W. Craven and J. Cate, eds, *The Army Air Forces in World War II*, vol. 5, *The Pacific: Matterhorn to Nagasaki* (Chicago, 1953), pp. 615–16. Estimates regarding the destruction and lethality of the firebombing campaign against Japan are varied. Figures used in this article reflect those most often cited in secondary sources covering the topic, and are generally those considered to be in the middle of the range of discrepancies.

that laid waste to more than 60 of Japan's largest cities and killed hundreds of thousands of its civilians by the end of the Second World War.<sup>3</sup>

This assault on Tokyo, arguably the most devastating air raid of the war, represented a radical departure from the position the USA had taken at the onset of fighting. In 1939 US President Franklin D. Roosevelt had requested that combatants refrain to the greatest extent possible from inflicting civilian casualties, and US policy mirrored the request, following the doctrine of daylight 'precision' bombing developed by the Army Air Corps in the interwar years. Yet by the end of the war the USAAF was waging essentially an indiscriminate firebombing campaign against all of urban Japan. How did this happen?

Much has been written about the Pacific air war, but it has not fully accounted for the crucially important relationship between USAAF Chief General Henry 'Hap' Arnold and his subordinate generals in the field, most importantly Curtis LeMay.<sup>4</sup> In fact, the most recent scholarship claims that that relationship was irrelevant to the development of the incendiary campaign, and goes even further by arguing that the campaign was inevitable by late 1944 and was the result of months of systematic planning.<sup>5</sup> I shall argue that the relationship between Arnold

<sup>3</sup> The air arm of the United States Army changed its name several times. From 1926 until 1941 it was known as the Army Air Corps; from 1941 until 1947 (encompassing the dates of this article) it was called the United States Army Air Forces (USAAF). It gained its independence from the army in 1947, and became the United States Air Force (USAF). In this article the term 'air force' is used generically to refer to any of these names.

<sup>4</sup> The European air campaign and the dropping of the atomic bombs seem to have overshadowed the Japanese air campaign. Regardless, a solid amount of literature does dedicate itself to the air war in the Pacific prior to Hiroshima. It includes: Craven and Cate, *Army Air Forces*, vol. 5; M. Caidin, *A Torch to the Enemy* (New York, 1960); W.H. Morrison, *Point of No Return: The Story of the 20th Air Force* (New York, 1979); K. Herbert, *Maximum Effort: The B-29s against Japan* (Manhattan, KS, 1983); C. LeMay and B. Yenne, *Superfortress: The Story of the B-29 and American Air Power* (New York, 1988); E.B. Kerr, *Flames over Tokyo: The US Army Air Forces' Incendiary Campaign against Japan, 1944-1945* (New York, 1991); K.P. Werrell, *Blankets of Fire: U.S. Bombers over Japan during World War II* (Washington, 1996); D.L. Haulman, *Hitting Home: The Air Offensive against Japan* (Washington, 1999). There are a greater number of books about air warfare in general that contain important sections relating to the air attack on Japan, including: R. Overy, *The Air War, 1939-1945* (New York, 1980); L. Kennett, *A History of Strategic Bombing* (New York, 1982); R. Schaffer, *Wings of Judgment: American Bombing in World War II* (New York, 1985); M.S. Sherry, *The Rise of American Air Power: The Creation of Armageddon* (New Haven, 1987); C.C. Crane, *Bombs, Cities, and Civilians: American Airpower Strategy in World War II* (Lawrence, KS, 1993); G. Perret, *Winged Victory: The Army Air Forces in World War II* (New York, 1993); R.A. Pape, *Bombing to Win: Air Power and Coercion in War* (Ithaca, 1996); T.D. Biddle, *Rhetoric and Reality in Air Warfare* (Princeton, 2002). Additionally, there are a handful of memoirs, autobiographies, and biographies that, while more personal, add important insight into the campaign, including: H.H. Arnold, *Global Mission* (New York, 1949); C.E. LeMay with M. Kantor, *Mission with LeMay* (New York, 1965); H.S. Hansell, Jr, *The Strategic Air War against Japan* (Maxwell, AL, 1980); T.M. Coffey, *Hap: The Story of the U.S. Air Force and the Man Who Built It, General Henry H. 'Hap' Arnold* (New York, 1982); H.S. Hansell, Jr, *The Strategic Air War against Germany and Japan* (Washington, 1986); T.M. Coffey, *Iron Eagle: The Turbulent Life of General Curtis LeMay* (New York, 1986); D.A. Daso, *Hap Arnold and the Evolution of American Airpower* (Washington, 2000).

<sup>5</sup> T.R. Searle, "It Made a Lot of Sense to Kill Skilled Workers": The Firebombing of Tokyo in March 1945', *Journal of Military History*, LXVI (2002), pp. 103-34.

and his field commanders, including the politics in which that relationship was formed, is central to an understanding of the final stages of the Pacific air war. And I shall argue further that there was nothing systematic or preordained about the course of the incendiary campaign.

A close look at the documentation reveals a process that was highly incremental and improvised. Urban area firebombing was pushed along by differing and changing considerations and motivations, and was never planned at the highest levels of government. By early 1945 it was clear that the accepted strategy of precision bombing was not working. This failure jeopardized air force influence within the Pacific theatre and threatened the struggling B-29 programme; this, in turn, jeopardized the USAAF's long-sought goal of institutional autonomy from the army. General Arnold placed General LeMay under intense pressure to find some way to make strategic bombing work in the Pacific. And here is where USAAF policy turned: LeMay met Arnold's challenge by drastically altering bombing tactics and by targeting whole Japanese residential zones rather than specific factories. The political leaders and high commanders yielded authority to the commander in the field, placing upon his shoulders the onerous responsibility for changing US bombing policy in a dramatic way.

This essay will offer a comprehensive analysis of the shift to urban incendiary targets in the US bombing campaign against Japan during the Second World War. First, the essay will briefly examine the background conceptions behind air force strategic thought, and further consider how basic ideas and opinions about Japan's vulnerability to fire entered official channels. Then it will examine the most important phase of the strategic and tactical shift to firebombing: General Arnold's growing admiration of a young field commander, and his increasing willingness to give him more and more authority as the pressure mounted to prove the worth of the B-29 and USAAF. This is most of all a story of two ambitious generals who, unquestioned by senior leaders, created a situation where military decisions with enormous consequences, in both operational and moral terms, were made on an ad-hoc basis in the field.

The bombing policy to which the Americans adhered for most of the war centred upon the daylight, high-altitude 'precision' bombing of selected industrial and supporting targets, developed at the Air Corps Tactical School (ACTS) in the 1930s. One author of the strategy at ACTS was General Haywood Hansell, who was steeped in the 'industrial fabric' theory: the idea that attacks on key 'bottleneck' factories in a nation's industrial 'web' would undermine the foundation of the enemy's war economy. He, after the war, said that:

The substance of [precision bombing] as defined at the Tactical School was that 'the will and capability of a modern industrialized nation to wage war can be undermined and caused to collapse by destruction of carefully selected targets in the industrial and service

systems on which the enemy people, their industries, and the armed forces are dependent.<sup>6</sup>

General Arnold stated in 1940 that ‘the Air Corps is committed to a strategy of high-altitude, precision bombing of military objectives ... Use of incendiaries against cities is contrary to our national policy of attacking only military objectives.’<sup>7</sup> President Franklin Roosevelt sharply criticized the practice of civilian bombing in his ‘Quarantine Speech’ of 5 October 1937, and again in 1939 when war erupted in Europe, declaring:

The ruthless bombing from the air of civilians in unfortified centers of population during the course of the hostilities which have raged in various quarters of the earth during the past few years, which has resulted in the maiming and in the death of thousands of defenseless men, women and children has sickened the hearts of every civilized man and woman, and has profoundly shocked the conscience of humanity.

The Department of State as well made a number of statements that condemned the civilian bombing occurring in China and Spain in the late 1930s.<sup>8</sup>

Under the guidance of Hansell and others, daylight precision bombing was implemented in the skies over France in 1942 with B-17 and B-24 heavy bombers. USAAF planes were armed with Norden bombsights, devices that were designed to give the bombardier pinpoint accuracy from thousands of feet above the target. But the poor weather over northern Europe often undermined the utility of the Norden bombsight. In order to increase the tempo of the US bombing campaign in Europe, General Arnold approved, in early November 1943, ‘blind bombing’ using radar-aided target acquisition systems. While this pulled the practice of bombing away from pre-war theory, especially since American crews had poor accuracy when bombing by instrument, the USAAF still focused mainly on industrial targets in Europe, and revealed a strong sensitivity to any allegations that its bombing practices converged with the ‘area bombing’ the British had adopted early in the war.<sup>9</sup>

In February 1945 the Anglo-American allies conducted a devastating raid against the city of Dresden in Germany. A few days after the attack, British Air Commodore C.M. Grierson suggested at a press briefing that some objectives of the raid had been anti-civilian in nature. These words made the USAAF leadership irate, and one general referred to

<sup>6</sup> Hansell, quoted in C.H. Builder, *The Icarus Syndrome: The Role of Air Power Theory in the Evolution and Fate of the U.S. Air Force* (New Brunswick, 1994), p. 77.

<sup>7</sup> Arnold, quoted in C.L. Chennault, *Way of a Fighter: The Memoirs of Claire Lee Chennault* (New York, 1949), p. 97.

<sup>8</sup> J.W. Dower, *War without Mercy: Race and Power in the Pacific War* (New York, 1986), pp. 39, 38.

<sup>9</sup> Biddle, *Rhetoric*, pp. 258–59.

the incident as a case of 'absolute stupidity by an incompetent officer'. A controversy raged, first of all because the AAF did not want the public to think it was attacking German civilians, and second because some AAF generals, such as George C. McDonald, an intelligence officer, investigated the AAF daylight attacks further and found their lack of precision and possible anti-civilian nature to be disturbing.<sup>10</sup>

Later that month the USAAF mounted Operation Clarion, an attack on German transportation targets in small towns. During this operation, a number of high-ranking officers in the USAAF were worried about public opinion concerning these attacks on civilian centres and had moral reservations of their own.<sup>11</sup> Lieutenant General Ira C. Eaker, former commander of the 8th Air Force in Germany, wrote to Lieutenant General Carl Spaatz (who was then co-ordinating Clarion) and asked him not to carry out the attack: 'We should never allow the history of this war to convict us of throwing the strategic bomber against the man in the street.'<sup>12</sup> Spaatz went ahead with Clarion anyway, but remained, according to one general's diary, 'determined that the American Air Forces will not end this war with a reputation for indiscriminate bombing'.<sup>13</sup> As the spring and summer of 1945 would show, the Japanese 'man in the street' was given very different consideration, and the AAF ended the Pacific war with a very different reputation.

The plane to be featured in the Pacific, and designed to deliver crushing strikes with greater precision, more bombs, and longer range than any other bomber, was the Boeing B-29 'Superfortress'. First conceived in 1939, it truly was a next-generation bomber. It towered three stories high, weighed almost twice as much as the B-17, and had twice the horsepower of its Boeing predecessor. The plane was the first military aircraft to have a pressurized cabin, allowing it to fly at extremely high altitudes, but requiring expensive and flawless manufacturing.<sup>14</sup> The cost of the development of the plane was enormous to the Air Corps, topping off around US\$3 billion. (In comparison, the atomic bomb programme cost US\$2 billion.)<sup>15</sup>

General Arnold was the major impetus behind the B-29 programme. According to Curtis LeMay, the general who would become linked with the B-29, 'if one were to attempt to point a finger to a single man as the "father of the B-29," it would have to be General Henry Harley

<sup>10</sup> Schaffer, *Wings*, pp. 99, 100.

<sup>11</sup> Op. cit., pp. 91–92.

<sup>12</sup> Letter, Eaker to Spaatz, 1 January 1945, Library of Congress, Washington, DC, Carl A. Spaatz papers, box 20.

<sup>13</sup> Schaffer, *Wings*, p. 102.

<sup>14</sup> The fact that the B-29 could fly very fast at altitudes above 30 000 feet was one of the plane's best defences. The Japanese did not have a fighter designed to intercept a bomber at such an altitude. It took a skilled pilot in a modern Japanese fighter to reach the B-29s. Though it could be done, and it was, the fighter burned so much fuel to get as high as the B-29s that it usually had enough fuel left for only one pass at the bombers. Also, the majority of Japanese anti-aircraft guns and searchlights fell short of the B-29s. Kerr, *Flames*, pp. 61–63.

<sup>15</sup> Op. cit., p. 26.

“Hap” Arnold, the Air Corps’s commander’. Arnold foresaw great power in the hands of the Air Corps: ‘It was on Hap’s desk that the buck of future strategic air power stopped.’<sup>16</sup> Even when B-17s and B-24s were just beginning to roll off the assembly lines, Arnold was calling for a bomber that would officially be designated a *very* heavy bomber. Contemporaneously, Boeing had also been discussing the idea of a super-bomber. When the two ideas merged, the XB-29 design was born. And when Germany began to sweep across the continent, the Army Air Forces did not waste any time. On 17 May 1941 Arnold placed an order for 250 production-line B-29s. In a completely novel fashion, the Air Corps had ordered into production a revolutionary plane without once flying a pre-production prototype. LeMay later wrote, ‘Arnold took a calculated risk of unprecedented proportions – everything could have exploded in his face.’<sup>17</sup>

The programme nearly did explode in his face. B-29 development ran into countless problems. The plane was plagued by dozens of bugs during and after production: leaks, fires, and failures recurred, especially with the engines. In 1942 the first model tested caught fire and crashed into a Seattle building, killing an entire top-notch Boeing test crew and others on the ground. But Arnold refused to allow the tragedy to halt progress.<sup>18</sup> The B-29 project was officially approved by the Joint Chiefs of Staff and by President Franklin D. Roosevelt in November 1943. The bomber’s target, for reasons of timing, would be Japan.

Planning for air attacks on Japan, as in Europe, focused on precision targeting of industrial/military installations. Planners understood, however, that Japanese cities were vulnerable to fire, and this worked its way into official thinking about a future air war over Japan.<sup>19</sup> As early as November 1941, at a secret press meeting of seven Washington correspondents, General George Marshall, chief of the general staff in Washington, stated that the USA was preparing for the possibility of offensive firebombing strikes against Japanese cities from the Philippines, which were being reinforced at that time.<sup>20</sup>

But despite the recognition of Japanese vulnerability to fire, General Arnold stood by his belief that the strategy against Japan would be the ‘destruction of Japanese factories in order to cripple production of munitions and essential articles for maintenance of economic

<sup>16</sup> LeMay, *Superfortress*, p. 23.

<sup>17</sup> Op. cit., pp. 37, 24.

<sup>18</sup> Arnold, *Global Mission*, p. 478.

<sup>19</sup> Schaffer, *Wings*, p. 107.

<sup>20</sup> This was an odd statement for November 1941, considering that only 10 days earlier Marshall had stated that there would be no air attack against civilians in Japan, considering Japan was effectively out of bomber range, and considering that the USAAF was still wedded to precision bombing theory. Historians have a few theories to explain Marshall’s statement. He may have assumed his statement would leak, and thus was specifically trying to deter Japan from attacking the US. Others speculate the opposite, that he was trying to stop a premature press leak about the armament of the Philippines that might provoke the Japanese military. (Sherry, *Rise*, p. 109; Werrell, *Blankets*, p. 46.)

structure in Japan'.<sup>21</sup> To hone the bombing strategy further, in March 1943 he asked the Committee of Operations Analysts (COA) to study bombing objectives in Japan. The COA had been founded a year earlier for the purpose of studying European strategic bombing targets, and consisted of both military and civilian experts, including bankers and economists, corporate attorneys, a physicist, and career military intelligence men, among others. With such a diversified roster, it was a committee that, much like Arnold, kept an open mind, and had freedom to investigate the entire range of possibilities.

At approximately the same time that he requested the COA to begin target analysis, Arnold was inquiring into the use of incendiary bombs against factories. He asked Major General O.P. Echols, assistant chief of staff for materiel, for a report on incendiary effectiveness against industrial plants. In his reply Echols explained that intense testing was shortly to take place at Dugway Proving Ground that would examine the capabilities of firebombs. What Echols failed to mention to Arnold was that the structures built at Dugway would be replicas of German and Japanese residential dwellings, *not* factories, because the proving ground team knew the British found it more effective to drop incendiaries on residential sectors near factories.<sup>22</sup>

The COA took the results of this testing into account as it grappled with the problem of Japanese targeting. After months of research and discussion, in November 1943 it handed its first report on Japanese targeting to General Arnold. For the most part, the COA's targets were based on precision bombing doctrine, though not completely. 'Economic Objectives in the Far East' named the six most important strategic targets in Japan in no order of priority: steel, merchant shipping, aircraft plants, anti-friction bearings, electronics, and urban industrial areas. Within these larger targets, the COA also singled out the most important individual plants that should be hit. With regard to the urban areas, the committee explained its rationale for adding them to the target list by saying, 'Japanese war production (aside from heavy industry) is peculiarly vulnerable to incendiary attack of urban areas because of the widespread practice of subcontracting to small handicraft and domestic establishments. Many small houses in Japan are not merely places of residence, but workshops contributing to the production of war materials.'<sup>23</sup> While the COA had hit on an unusual aspect of the Japanese economy, that certain light industries were fed by urban residential home shops, its report contained few hard-hitting estimates related to incendiary bombing, and almost entirely designated precision industrial targets.

General Arnold approved the report, and sent a synopsis to the Joint Chiefs of Staff, who would consequently issue a parallel target list in

<sup>21</sup> Werrell, *Blankets*, p. 43.

<sup>22</sup> Kerr, *Flames*, pp. 28, 29.

<sup>23</sup> Op. cit., p. 46.

April 1944. And despite the calls of some airmen for test incendiary raids against Japan, Arnold held firm to precision doctrine.<sup>24</sup> On 7 August 1944, months after approving the COA report, Arnold wrote to Lieutenant General George C. Kenney, the commanding general of Allied air forces in the southwest Pacific, and celebrated the precision of a recent attack on the Showa Steelworks: 'The steel finishing plant had a large well-developed mass of flame and smoke issuing from it ... I feel that we can look forward to additional effective daylight attacks.'<sup>25</sup> On 17 December 1944 Arnold was still committed to daylight precision raids of factories. He wrote to LeMay (then in charge of the XX Bomber Command in China), 'I have just learned that on the Singapore attack 41% of your bombs were within 1000 feet of the briefed aiming point. I don't have to tell you that I am impressed by this progress ... I think we can do better.'<sup>26</sup>

But while Arnold was committed to daylight precision bombing, the COA began to place more weight on urban incendiary bombing, submitting its 'Revised Report of the COA on Economic Objectives in the Far East' to General Arnold on 10 October 1944.<sup>27</sup> The target list had been pared down to three targets, and was now prioritized for attack by the newly created XXI Bomber Command, soon to be based out of the recently captured Mariana Islands. The first priority was attack on the aircraft industry (precision bombing). Second was attack on urban industrial areas (area incendiary bombing of the six major cities of Honshu). Third was an aerial mining campaign against shipping. No other target system warranted attack. This report, in contrast to the report of 1943, was a strong endorsement of area incendiary bombing. Only one of its targets required precision bombing. Essentially, its recommendation was that as soon as the USAAF had cleared the skies of Japanese planes, the B-29s should turn on six (and, it must be noted, only six) urban areas for firebomb attack.<sup>28</sup>

The minutes of the COA meetings in September reveal the detailed reasons for the suggested strategic shift. Colonel John F. Turner said, 'We have been intrigued with the possibilities ... of complete chaos in six cities killing 584 000 people.' In these cities 70% of the housing would be destroyed. Through the death of workers, the destruction of home industries, and forced homelessness, the attacks would have noticeable effects on the Japanese economy (especially machine tools) – output would drop by about 15%. The attacks would have little immediate

<sup>24</sup> *Op. cit.*, pp. 45–46, 58–59.

<sup>25</sup> Letter, Arnold to Kenney, 7 August 1944, Library of Congress, Washington, DC, Henry H. Arnold papers, box 107.

<sup>26</sup> Letter, Arnold to LeMay, 9 December 1944, Arnold papers, box 107.

<sup>27</sup> The whole report was divided into two separate smaller reports, the first providing target priorities premised on defeat of Japan without invasion, the second giving priorities premised on defeat of Japan following an invasion. Most discussion was placed in the second report, as it seemed the probable course of action. It is this second report that is discussed in this paper.

<sup>28</sup> Revised Report of COA on Economic Targets in the Far East, 10 October 1944, Air Force Historical Research Agency, roll A1002.

effect on Japanese front-line military strength, but would have an effect in the long run.<sup>29</sup>

Factory destruction was clearly not the COA's only goal in proposing incendiary attacks on Japanese cities. It considered the possibility of wholesale psychological collapse. Commander William M. McGovern, of the Office of Strategic Services (OSS), argued this point strongly: 'The panic side of the Japanese is amazing.' And fire could rouse this panic, as it was 'one of the great things they are terrified at from childhood'. His words were 'all in favour of Japanese area bombing', and his proposal was to 'raise Hell ... Knock out Tokyo, and the Japanese throughout the country would say we have been hit.' After a few major fire attacks, the Japanese would demand that their government surrender.<sup>30</sup>

Arnold accepted the COA report and passed it on to his staff to incorporate into planning. But approval is not the same as implementation. There was no timetable set for fire raids; there was no discussion with senior leaders; there were no major consultations or exchanges with the British on night-time area bombing tactics; there was no massive stockpile of incendiary ordnance gathered on the Marianas.<sup>31</sup> Arnold had simply added firebombing to his list of options. As he said himself, to the president of the AAF Board, 'I want you to consider ... any new and different uses to which our mounting air power can be put in fighting and winning this war'.<sup>32</sup> He was not a man who ever dismissed 'radical thinking'. All sorts of ideas passed by his desk and met approval.<sup>33</sup> Arnold would continue to demand precision bombing, but would not preclude the possibility of incendiary attacks. It would then take a number of immediate pressures – compounded by the air force's inability to bomb effectively – to overcome accepted 'precision' doctrine and effect the switch to urban incendiary bombing. These pressures weighed heavily on General Arnold, and he would in turn pass them on to his subordinates.

To understand fully how this process of stress and shared burden played out, one must first understand the questions surrounding the

<sup>29</sup> Minutes of COA meetings, 13, 14 September 1944, Air Force Historical Research Agency, roll A1005.

<sup>30</sup> Minutes of COA meetings, 27 September 1944, Air Force Historical Research Agency, roll A1005.

<sup>31</sup> In fact, LeMay ran out of incendiary bombs after his initial low-level attacks and had to wait a number of weeks to stockpile more.

<sup>32</sup> Letter, Arnold to Eubank, 6 May 1944, Arnold papers, box 114.

<sup>33</sup> Arnold showed interest in starving the population by the aerial mining of fishing lanes and the poisoning of crops, going so far as to order tests to determine what chemical would best be used to kill rice; he gave consideration to the use of poison gas; he proposed paratroop missions that bordered on suicidal; at the beginning of the war, airmen floated the idea of using bats strapped with incendiaries to attack the country. None of these extreme proposals for which Arnold showed interest were ever implemented in the skies. It therefore cannot be argued that simply because Arnold showed interest in an idea and approved its development it therefore was a given. (Letter, Eaker to Deputy Chief of Air Staff, 3 August 1945, Arnold papers, box 114; Memorandum, Arnold to Chief of Staff, 30 May 1945, Arnold papers, box 114; Letter, Arnold to Eubank, 6 May 1944, Arnold papers, box 114.)

future use of air power at the time. When the United States entered the Second World War, no one was completely sure how air power would best be applied. General Arnold believed in and was committed to the idea that planes could be effective independent weapons engaging in strategic bombing, not simply tactical support tools of armies and navies. He argued, 'There can be but one justification for our tremendous and expensive Air Forces organization – it must play a decisive role in the decisive defeat of our enemies.'<sup>34</sup> If Arnold's USAAF could accomplish this effectively, then Arnold would have a strong argument for air force independence from the army – a goal airmen had sought for years. Japan was the Army Air Forces' last and best chance to prove that it deserved postwar autonomy. Arnold did not know how much the AAF had to achieve to make its case, but he assumed that air power had to be decisive in the theatre. He was prepared, at least, to err on the side of overwhelming force if necessary.

The pressure to do ever more for the purpose of air force independence manifested itself in many ways. First to feel it were those within the B-29 programme. As mentioned above, Arnold had risked his career for this US\$3 billion endeavour. It was the B-29 that could grant air force independence, because it was the weapon that could deliver fire-power in ways the army and navy could not. But Arnold constantly risked losing his B-29s to the insatiable needs of the army and navy.<sup>35</sup> In early 1944 Arnold specifically designed the 20th Air Force (which would contain the XX and XXI Bomber Commands) to be as far removed from other branches of the military as possible. In a novel fashion, the 20th reported not to the army, but directly to the Joint Chiefs of Staff. Arnold, a member of the JCS, was both commanding general of the 20th as well as executive agent for the JCS in the Pentagon.<sup>36</sup> The JCS created the broad strategic framework, but within that framework Arnold could do essentially whatever he wanted.<sup>37</sup>

Command freedom did not guarantee wartime independence, however. Arnold was very candid in his memoirs about his fears that the Air Forces would be subordinated in the Pacific theatre. He recalled that Admiral King, the highly effective commander of the US Fleet, said, 'Trouble with all this rearrangement and reorganization is your Air Force, Hap. If you would take your Air Force and bring it over to the Navy, then the Navy ... would be the largest and most powerful force in the world.'<sup>38</sup> Arnold certainly had no desire to follow this plan, and was instead determined to keep his 20th as far from naval operations as possible. But even if Arnold maintained an independent air arm, he still would have to prove he was achieving results with his B-29s in order to keep them. After all, with an appeal to the JCS or to the

<sup>34</sup> Letter, Arnold to Eubank, 6 May 1944, Arnold papers, box 114.

<sup>35</sup> Hansell, *Germany and Japan*, pp. 154, 156.

<sup>36</sup> Craven and Cate, *Army Air Forces*, vol. 5, p. 38.

<sup>37</sup> Sherry, *Rise*, p. 221.

<sup>38</sup> Arnold, *Global Mission*, p. 537.

President, the 20th's planes could be relocated. Arnold later wrote, 'MacArthur yelled for the B-29s; Nimitz wanted the B-29s; Stilwell and Mountbatten wanted the B-29s – all for tactical purposes. Even the French Navy asked us for planes.'<sup>39</sup> Arnold needed to keep his planes because he wanted more than just to win the war: he wanted his *Air Forces* to win the war.

This goal was to be accomplished by the XXI Bomber Command, stationed in the newly captured Mariana Islands in the autumn of 1944. Even at their capture, Arnold recalled some inter-service insecurity:

Reporters had ... talked about the *Naval* capture of the Islands. The *Navy* would take the Islands and use them as a base. No one had mentioned using them as bases for the B-29s, yet it was the B-29s and the B-29s only that could put tons and tons of bombs on Japan. The fleet couldn't do it; the Naval Air couldn't do it; the Army couldn't do it.

So Arnold decided 'it was essential that this phase of the Pacific campaign be brought to the attention of the American people'.<sup>40</sup> Others at the same time felt this same insecurity and the dangers it posed to postwar air force plans. Lieutenant General Barney Giles, commanding general of the USAAF in the Pacific wrote to Lieutenant General George Kenney, commander of the Far East Air Force, complaining:

During the last few months there has been very little publicity given to this mighty arm – most of the credit going to ground commanders ... It is air power that this Country has *after the War* that we must think of, as well as now ... I am doing everything possible to strengthen our Public Relations Department here in Washington.<sup>41</sup>

With General Curtis LeMay operating out of China, General Arnold placed his chief of staff, Brigadier General Haywood Hansell, in charge of the XXI Bomber Command. Hansell landed the first B-29 on Saipan on 12 October 1944, and felt pressure from the start. Arnold reminded him in a September letter:

As you well know, the original conception of the B-29 was an air-plane that would carry tremendous loads for tremendous distances. We have not to date fulfilled this promise ... I know that you, in your position as commander of one of our greatest striking forces, will do your utmost to help accomplish the earliest possible defeat of Japan. This can only be done by making the best possible use of the weapon at your disposal.<sup>42</sup>

Arnold wanted results.

Unfortunately, Hansell's command was troubled from day one. The air-bases were not yet completed; not all the planes had arrived; supplies

<sup>39</sup> Op. cit., pp. 541, 542.

<sup>40</sup> Op. cit., p. 536.

<sup>41</sup> Letter, Giles to Kenney, 27 September 1944, Arnold papers, box 114. Italics added.

<sup>42</sup> Letter, Arnold to Hansell, 22 September 1944. Letter reprinted in Hansell, *Japan*, p. 129.

were short; and the B-29s were plagued with bugs, from the engines (which repeatedly caught fire) to the fuel systems to cabin pressurization. Hansell's first target was the Nakajima aircraft plant at Mushashino, to the northwest of Tokyo. It was the single most important target in Japan, producing (along with another Nakajima plant nearby) 30 to 40% of all combat aircraft engines. In an ominous preview, weather caused repeated cancellations of the mission against Mushashino; on three of these occasions, the crews were in their planes on the runway when the mission was called off. Finally, after an intense week of waiting, the raid went forward on 23 November. Of the 111 B-29s that took off, 17 turned back with fuel problems; 6 missed their runs because of other mechanical problems; 1 plane was lost in combat; only 24 planes bombed the primary target; 64 unloaded on the Tokyo docks (or into the bay beyond), the secondary target. Only 1% of the plant was damaged.<sup>43</sup> Weather proved to be the biggest hindrance to the mission. First, the B-29 formations were broken up as they passed through a massive front off the coast of Japan. Then, flying over the target, the airmen found themselves in a stunning 140 mph tailwind that pushed their planes to 445 mph over the ground – much too fast for accurate bombing.<sup>44</sup>

Hansell again struck at Mushashino, three days later. Clouds obscured the target, making it impossible to bomb. On 3 December weather foiled Hansell's plans to attack Mushashino for a third time, as well as another plant at Ota. This time the skies were clear, but winds were 190 mph at bombing altitude. On 13 December, Hansell turned his B-29s upwind and tasted some success with accuracy, but 31 planes were damaged by enemy fire. All in all, according to Hansell:

The next three months (November 1944 through January 1945) were frustrating, to say the least. Schools worked hard to train the lead crews, determined to improve accuracy. Enormous efforts were made to upgrade maintenance ... The weather was a terrible opponent, and there was no intelligence of its movements ... Morale was a critical problem. The airplane engines were still unreliable.<sup>45</sup>

Experience and training were not paying off.

Whereas Arnold read Hansell's long reports of problems with bombing accuracy, plane maintenance, and crew morale, he read reports of the opposite nature from Curtis LeMay in China. From October to December, LeMay inflicted noticeable damage on two (smaller) Japanese aircraft

<sup>43</sup> Kerr, *Flames*, p. 101.

<sup>44</sup> This unfamiliar wind that slammed the B-29s flying 30 000 feet above the target was the jet stream. As the USA had now developed a plane that flew at such an altitude, the jet stream would have a huge effect on the accuracy of further high-altitude raids. Downwind, bombing accuracy was difficult; crosswind, accuracy was impossible; into the wind, accuracy was possible, but the planes would slow down so much that they would be at the mercy of anti-aircraft fire and enemy fighters that had the technological capability to reach them. (Searle, 'It Made a Lot of Sense', p. 112.)

<sup>45</sup> Hansell, *Germany and Japan*, p. 193.

factories within his range, as well as eye-catching pinpoint damage on dry-dock targets. Arnold wrote to him:

The progress you have been making in adding to your bomb load is most gratifying. You will recall that at the time that you first took command of the XX, one of my greatest concerns was the fact that the B-29 had not yet demonstrated its ability to carry a reasonably large weight of bombs. We haven't completely whipped this to my satisfaction yet, but I am pleased with the improvement.

And not only was Arnold proud of the B-29's payload accomplishments, but also of its visually stunning destructive capabilities: 'I have seen your bomb strike and PRU photos of Okayama and Omura ... and I have proudly displayed them whenever opportunity arose.' There is no doubt that those to whom Arnold most proudly flaunted the photographs were the same officers of the army and navy who were itching to get their hands on his B-29s.<sup>46</sup>

Arnold passed on the news of LeMay's accomplishments to Hansell, hoping he could spur the Mariana airmen to better results. But Hansell continued his generally poor performance, and LeMay looked better and better despite having to deal with his own terrible logistical problems.<sup>47</sup> While LeMay was dropping 41% of his bombs within 1000 feet of the target, Hansell's best results were 14% accuracy. The correspondence between LeMay and Arnold reveals how Arnold was beginning to rely on LeMay to provide the results he needed to achieve his lofty goals for his air force, which he articulated clearly. Steadily, LeMay was winning Arnold's respect and real admiration. He had the foresight to anticipate Arnold's concerns and address them fully; unlike Hansell, he offered no excuses, never asked for more time, and, most importantly, solved problems. As early as 13 November, Arnold wrote to LeMay explaining he was considering moving the young general out of China in the future.<sup>48</sup> LeMay responded on 29 November by sending Arnold a report detailing XX Bomber Command increases in accuracy, bomb load, and flying hours. Arnold was pleased, and wrote back:

As you say in the letter, the report and the accompanying charts helped answer some of the questions that are constantly on my mind. I follow the work of the XX Bomber Command in far greater detail than you probably think ... As I told you before you went out to India, the B-29 project is important to me because I am convinced that it is vital to the future of the Army Air Forces.

<sup>46</sup> Letter, Arnold to LeMay, 9 November 1944, Arnold papers, box 107.

<sup>47</sup> Hansell did have occasional successes, one such against the Mitsubishi plants at Nagoya on 13 December.

<sup>48</sup> Letter, Arnold to LeMay, 13 November 1944, Library of Congress, Washington, DC, Curtis E. LeMay papers, box B11.

Arnold made it clear to LeMay that he thought the AFF could do ‘better bombing with the B-29 than has been done by any aircraft up to this time and I expect you to be the one to prove this’.<sup>49</sup> Again, one sees the emphasis that Arnold placed on the B-29s in their role of bringing the USAAF independence and prestige. ‘Better bombing’ from these planes was the key to all sorts of successes.

But simply because LeMay, as Arnold wrote, ‘had the right attitude’ and was achieving some of this ‘better bombing’, one should not assume that Arnold had given up on Hansell’s capabilities. On 18 December, searching for different results from the Marianas, Arnold’s chief of staff, Brigadier General Lauris Norstad, sent Hansell a teleconference message asking him to perform a full incendiary strike on the city of Nagoya, in daylight with approximately 100 bombers. The purpose of the attack was both to destroy sections of the city and to test out a new aimable incendiary bomb cluster. Hansell protested:

I have with great difficulty implanted the principle that our mission is the destruction of selected primary targets by sustained and determined attacks using precision bombing methods ... We are just beginning to get results ... I am concerned that a change to area bombing of the cities will undermine the progress we have made.<sup>50</sup>

Norstad replied that the primary targets were not changing, and that this strike was ‘simply a special requirement resulting from the necessity of future planning’.<sup>51</sup> Hansell was stunned. He had helped author precision bombing strategy and firmly believed that it would work. He would hold these beliefs throughout the war.

Hansell’s resistance to this new approach could not have helped his command. Nor did he help his command when, in a press interview in late December, he stated, ‘these first accomplishments ... are far from the standards we are seeking ... We have much to learn and many operational and other technical problems to solve.’<sup>52</sup> Arnold did not want to hear about any more problems from Hansell; he was impatient, and wanted reports of big results. As he said himself, the ‘best evidence of how you are getting along is the pictures of the destruction that you have accomplished against your primary targets’.<sup>53</sup> Hansell was not providing these pictures. Shortly after Hansell’s interview, Arnold made the decision to relieve Hansell and replace him with LeMay. Norstad delivered the news to Hansell in person on 6 January. Again, Hansell was shocked, but now also extremely disappointed. General Arnold

<sup>49</sup> Letter, Arnold to LeMay, 9 December 1944, Arnold papers, box 107.

<sup>50</sup> Telecommunication, Hansell to Norstad, 19 December 1944, Air Force Historical Research Agency, roll 7731. (Quoted in Kerr, *Flames*, p. 118.)

<sup>51</sup> Hansell, *Germany and Japan*, p. 218. The fact that Hansell had no idea of the approval of urban area firebombing by Arnold reveals that firebombing, regardless of its approval, was still very much on the back burner. Norstad was bringing it more to the fore in the search for better bombing.

<sup>52</sup> Werrell, *Blankets*, p. 139.

<sup>53</sup> Letter, Arnold to Hansell, 30 December 1944. Letter reprinted in Hansell, *Japan*, p. 138.

wrote to him soon after, explaining his reasoning for the change in command: 'The job from now on is no longer planning and pioneering. It has become one of operating. LeMay ... should be our best qualified operator.'<sup>54</sup> This small statement is most revealing. Arnold did not want a planner in charge of his B-29s: he needed someone who would just get things done; again, he wanted results – and fast. Ironically, Hansell's last mission, flown on 19 January, produced these results. The Kawasaki factory, 12 miles west of Kobe, was devastated by 62 B-29s. Every important building in the entire complex was hit. Production fell by 90%. Not a single B-29 was lost. Hansell flew back to the United States the next day.<sup>55</sup>

Hansell's relief proved to be a turning point in the implementation of urban incendiary bombing. Hansell had come to believe that Arnold was relying too much on high face-value numbers in evaluating bombing success, and later wrote that his commanding officer had an 'impatience and [an] inclination to measure strategic air attacks in terms of tonnage and sorties. He was under constant pressure and criticism from his associates on the Joint Chiefs of Staff and from higher authority to explain what his Twentieth Air Force was accomplishing.' In the case of his precision missions, Hansell knew that it was 'exceedingly difficult to measure and evaluate the results of selective target bombing ... On the other hand, statistics of tons of bombs dropped and of sorties flown are easily compiled, seem factual and specific, and are impressive. Photographs of burned-out cities also speak for themselves.'<sup>56</sup> Hansell was a self-proclaimed staunch supporter of precision attack and openly disagreed with the shift to area bombing because he held that precision bombing would achieve increased success in the future. Because of these views, he probably would have resisted firebombing far more than did LeMay. If Hansell had wanted precision bombing to be the centrepiece of his attack on Japan, he would have made it so. In fact, weeks after the start of LeMay's obviously powerful area bombing campaign, while Hansell was teaching precision bombing back in the United States, he actually wrote a letter to LeMay saying, 'Personally, I believe we will have to return to daylight bombing of selected targets, before we beat the Japanese down to the level needed.'<sup>57</sup>

<sup>54</sup> Letter, Arnold to Hansell, 1 February 1945, Arnold papers, box 66.

<sup>55</sup> Hansell, *Germany and Japan*, p. 223.

<sup>56</sup> Op. cit., pp. 212, 213.

<sup>57</sup> Letter, Hansell to LeMay, 29 March 1945, LeMay papers, box B11. It seems very hard to believe that a general who wrote this letter would submissively acquiesce to a massive incendiary campaign, as historian Thomas R. Searle asserts he would have in his article 'It Made a Lot of Sense'. To the contrary, there was nothing inevitable about the incendiary campaign simply because firebombing had appeared earlier on the COA and air staff target lists. Rather, its implementation came about because of Arnold's pressure to make strategic bombing work noticeably and LeMay's unique willingness to take a major gamble with his planes and reputation. And most important, nowhere in his discussions of earlier planning does Searle account for the magnitude of the 67-city firebombing campaign, a magnitude that separates the campaign from any other, and that proves it sprang from much more than earlier planning.

Arnold was getting more worried by the day about the lack of results the B-29 had to show for itself. And Arnold now more than ever equated bomb tonnage dropped with destruction, and destruction with positive results. He wrote to Norstad on 14 January:

I am still worried – we have built up ideas in the Army, the Navy, and among civilians of what we can do with our B-29s. We had all realized that in order to do considerable damage, large numbers of B-29s would have to deliver their loads of bombs against Japan continuously and consistently, and yet in spite of the above ... our average daily delivery rate against Japan is very, very small ... Unless something drastic is done to change this condition soon, it will not be long before the B-29 is just another tactical airplane.<sup>58</sup>

Again, one sees Arnold's fears that his plans for the B-29 would fail. Three days later he suffered his fourth serious heart attack in less than two years. His biographer believes the stress of the B-29 programme's shortcomings may have contributed to this attack.<sup>59</sup> Arnold travelled to Florida to recover, and Norstad took over his daily duties.

When LeMay took control of the Mariana airfields, pressure to perform was nothing new to him. Even as early as 23 September 1944, LeMay knew the importance of air force power in the fight against Japan. Norstad, echoing Arnold's equation of a large bomb load with air force independence, had written to him: 'I know you are as anxious as the rest of us to carry a big load of bombs in the B-29. I think the B-29 project has a tremendous significance on the future of the Air Forces so what we can do with it now is of the greatest importance.'<sup>60</sup> But when LeMay moved to the Marianas, he was now in charge of the most important bomber command that the AAF possessed: the stakes were higher. It is no coincidence that on 1 January, soon after Arnold made the decision to relieve Hansell, he wrote to LeMay in China, 'For your command in particular, the year 1945 will offer greater opportunities to bring the war home to Japan. I know you will take the fullest advantage of them.'<sup>61</sup> Exactly what 'fullest advantage' meant Arnold did not illuminate. Arnold did not really know. LeMay would have to figure that out. Thus as the pressure on Arnold increased, he was willing to grant LeMay more authority.

The day before LeMay took official command of the XXI, Norstad (now speaking for Arnold) made everything a little clearer: 'One point which was discussed with Hansell, and I think also to a limited extent with you, was the question of the size of force and rate of effort ... What General Arnold wants is the greatest possible number of bombs dropped on our priority targets in any given period of time.' Regardless of any problems, Arnold was 'looking more and more to the damage

<sup>58</sup> Coffey, *Hap*, p. 358.

<sup>59</sup> *Op. cit.*, p. 358.

<sup>60</sup> Letter, Norstad to LeMay, 23 September 1944, LeMay papers, box B11.

<sup>61</sup> Letter, Arnold to LeMay, 1 January 1945, LeMay papers, box B11.

reports for his evaluation of what a bomber outfit is accomplishing'. And just when it seemed he couldn't turn up the pressure much more, Norstad made his tone personal. 'I don't know of anyone better qualified to command than you. There is no doubt in my mind that you will fully justify General Arnold's confidence in your judgment and ability.'<sup>62</sup>

LeMay knew that Arnold wanted bigger numbers, and when he took command, he planned to better the statistics by working within the framework of precision theory, starting by continuing the improvements Hansell had initiated. He ran into immediate problems, and, typical of new commanders, blamed his predecessor. He found the staff 'practically worthless'. He told Norstad that the fliers 'think the obstacles too many and the opposition too heavy to crash through and get the bombs on the target'.<sup>63</sup> Frustration was felt at the Washington, DC, end as well. The day before LeMay wrote his blistering report of the command, Norstad penned a letter implying that the high mission abort rate was due to pilots' faltering 'leadership, judgment, courage, and skill'.<sup>64</sup>

Initially, LeMay conducted missions very similar to Hansell's. He ordered eight missions from January to early March, six of which were precision raids, the other two being experimental urban incendiary attacks. As for the precision raids, results were even worse than Hansell's. On three of the missions, not a single bomb was dropped on the primary target because of bad weather. The area incendiary missions did not prove particularly successful either (the most success coming from a daylight raid on Tokyo on 25 February that damaged one square mile of the city). And just at the point when Arnold probably imagined things could not get much worse, they did. On 17 February the navy launched a massive carrier-based dive-bomber assault on aircraft factories in the Tokyo area. One of its targets was the AAF nemesis, the Nakajima plant at Mushashino, which was damaged substantially in the attack. The press praised the navy highly for its daring raids, and Arnold, still convalescing in Florida, read the news. He wrote to General Giles:

if sixty or eighty [B-29s] is a maximum we can put over the Japanese mainland, a change in management is certainly in order. Nimitz, for instance, has every right to say, 'Give me command of these heavy bombers and I will get three hundred over Japan at a time.' ... And I know that there are one thousand other reasons for not getting two, three, or four hundred B-29s over Japan every other day. But all of these reasons must be pushed to one side with a grim determination.<sup>65</sup>

Arnold would have no more excuses from his field commanders. LeMay, in his typical fashion, did not need a letter from Arnold to figure out what to do. Two days after the navy attack, he sent 150 planes

<sup>62</sup> Letter, Norstad to LeMay, 19 January 1945, LeMay papers, box B11.

<sup>63</sup> Letter, LeMay to Norstad, 31 January 1945, LeMay papers, box B11.

<sup>64</sup> Letter, Norstad to LeMay, 30 January 1945, LeMay papers, box B11.

<sup>65</sup> Coffey, *Hap*, p. 360.

against Mushashino. Clouds blanketed the target, and not a bomb struck the factory. This was the seventh failure out of seven attempts at the plant.

It was an understatement when LeMay wrote to Norstad, 'We have been having a hell of a time with the weather lately.' Clouds obstructed targets; wind made precision bombing and navigation impossible; formations blew apart when they penetrated fronts off the coast. Thus LeMay had to make changes: 'I am working on several very radical methods of employment of the force.'<sup>66</sup> And radical these methods certainly were. In order to achieve results, LeMay wrote, 'I had to do something, and I had to do something fast.'<sup>67</sup> LeMay planned a massive incendiary raid on Tokyo residential zones. A major change he proposed was to lower significantly the altitude of the attack. First of all, this would eliminate weather problems because of weaker winds and fewer clouds. Second, flying at lower altitudes (between 5000 and 10 000 feet) would require less fuel because of less engine strain, thus allowing greater bomb loads. Third, lower altitude would mean greater accuracy. The danger of low altitude was exposure to flak and enemy fighters (although by this stage the number of Japanese fighters was dwindling). Therefore, to reduce this danger, LeMay decided to attack at night. Gambling on darkness as a suitable defence, and worried about friendly fire, LeMay offloaded the guns, ammunition, and gunners from the B-29s, allowing the planes to carry an extra 2700 pounds of bombs each. Formations did not work well at night, so planes would fly alone, further reducing fuel consumption, but increasing the need for successful navigation and adequate protection. These tactics were so radical that most crews thought they were going to die on the mission.<sup>68</sup> If LeMay's theories proved to be wrong, his pilots would be flying single-file into a death trap in the Tokyo night. LeMay claimed to have asked Norstad if Arnold would be willing to take a calculated risk. In typical fashion, according to LeMay, Norstad refused to commit himself or Arnold. LeMay was on his own, but he ordered the attack anyway.<sup>69</sup> As Michael Sherry puts it, 'Norstad was perfectly willing to give LeMay the rope with which either to hang himself or to run up the banners of glory.'<sup>70</sup> LeMay was risking his career and reputation, but he probably sensed that both of these would be in worse shape if he did not soon produce the post-strike photos Arnold demanded. As he said later: 'There are plenty of wolves around who were looking for the job – Norstad one of them.'<sup>71</sup>

<sup>66</sup> Letter, LeMay to Norstad, 3 March 1945, LeMay papers, box B11.

<sup>67</sup> Interview with Curtis LeMay, March 1970, Air Force Historical Research Agency, roll 43824.

<sup>68</sup> Werrell, *Blankets*, p. 159.

<sup>69</sup> Interview with Curtis LeMay, March 1970, Air Force Historical Research Agency, roll 43824.

<sup>70</sup> Sherry, *Rise*, p. 273.

<sup>71</sup> Interview with Curtis LeMay, March 1970, Air Force Historical Research Agency, roll 43824.

Thus on the night of 9 March 1945, 325 Superfortresses attacked residential Tokyo for the purpose of starting a conflagration that would wipe out as much of the city as possible. Lead crews firebombed an 'X' in the middle of the 10 square mile target area, and the rest of the armada followed, dropping 1665 tons of incendiary bombs on the Japanese capital. The target area contained an average population of 103 000 people per square mile. The Asakusa ward, one of the most densely populated areas of the world, contained 135 000 people per square mile.<sup>72</sup> Bombs of jellied gasoline rained down on the city for three hours, and by 3.0 a.m. a firestorm literally like none other was churning across the city, whipped by its own high winds, leaping effortlessly across firebreaks, flowing down the streets. People who were not immediately consumed by the fire spontaneously combusted, died inhaling heated air, or were trampled to death in the panic. Many of those who found cover in shelters and canals met similarly gruesome fates, and were baked, drowned, and boiled.<sup>73</sup> The fire was so intense that it had burned itself out by daybreak. But those few hours were enough to claim nearly 16 square miles of the city and approximately 100 000 lives – mostly women, children, and the elderly. According to the United States Strategic Bombing Survey, it was 'the greatest disaster ever visited upon any city'.<sup>74</sup>

But the mood in the Marianas was a different one. The attack was viewed as a rousing success by LeMay, Norstad, and Arnold. LeMay, knowing of plans to attack the six cities, immediately followed the raid with attacks on Nagoya (2 square miles destroyed), Osaka (8 square miles destroyed), Kobe (3 square miles destroyed), and Nagoya again (3 square miles destroyed). After all five raids were completed, the USAAF had destroyed 31.9 square miles of the four largest Japanese cities. In total, 9373 tons of bombs were dropped. In just five missions, the USAAF had inflicted destruction equal to 41% of the total destruction of German cities over the course of the war.<sup>75</sup> And this had been accomplished with less than 1% of the total bomb tonnage dropped on Germany. During the entire four-city campaign, only 22 bombers were lost.

On 3 April, Norstad sent LeMay a letter that summed up the mood of the USAAF Command. It was in marked contrast to the correspondence between the two men before the March blitz. 'The success of your operations during March was nothing short of wonderful ... I think you and your XXI Bomber Command have demonstrated courage, skill and adaptability which will have a critical influence on the war against Japan.' The next three months 'will certainly be Japan's hour of decision'. With more bombing, 'certainly their war-making ability will have

<sup>72</sup> Craven and Cate, *Army Air Forces*, vol. 5, pp. 615–16.

<sup>73</sup> For the most vivid descriptions of the attack, see Caidin, *Torch*.

<sup>74</sup> United States Strategic Bombing Survey, *Field Report Covering Air Raid Protection and Allied Subjects, Tokyo* (Washington, 1947), p. 63.

<sup>75</sup> Werrell, *Blankets*, pp. 167–68.

been seriously curtailed. Possibly they may lose their taste for more war. I am convinced that the XXI Bomber Command, more than any other service or weapon, is in a position to do something decisive.<sup>76</sup> Norstad was pleased not only because the destruction LeMay had achieved must have slowed Japan's war machine, but also, now that destruction of Japan could be accomplished so easily, because there was one air force goal that now seemed more than just a possibility – victory over Japan without a land invasion.

Hopes that the AAF could win the war without army invasion had been prevalent for months before this period, but were never openly discussed because official policy called for an invasion. General Hansell wrote in his memoirs that:

the factor of time was taking on a new insistence. The invasion of the Japanese home islands – whose necessity had become an obsession with the Army planners – had been agreed upon. If air power was to end the war without a massive bloodletting on the ground, its application could not be delayed.<sup>77</sup>

If the army was convinced of the need to invade Japan some time in the autumn of 1945, then the USAAF was equally determined to end the war before that time with air power. Once this lofty dream seemed possible with incendiary bombing, the air force embraced it. The official historians of the USAAF in the Pacific wrote that 'after studying the results of the March fire raids, LeMay came to the conclusion that with proper logistic support air power alone could force the Japanese to surrender – a view shared privately by some members of Arnold's staff in Washington'.<sup>78</sup> And as the fire raids continued, this belief became less and less private.

As LeMay and his staff slated more cities for attack, and as those attacks were carried out, congratulatory letters among the staff voiced all the benefits to the air force of incendiary bombing. On 20 April, General Giles, speaking for Arnold, wrote to LeMay:

The rate of your operations and their effectiveness clearly indicate sound organization ... The record of the 73rd Wing in flying 1331 sorties in the month of March and the one mission on which they carried maximum bomb load of 20 000 lbs. is most impressive. As you know, this has exceeded even our most optimistic plans up to six months ago.

He added, 'Due to the peculiar setup of the Japanese industrial targets and urban areas, the great capabilities of the B-29 and fine manner in which these aircraft are being handled, I am convinced that the Air Forces have an opportunity of making a major contribution to the Pacific war.'<sup>79</sup>

<sup>76</sup> Letter, Norstad to LeMay, 3 April 1945, LeMay papers, box B11.

<sup>77</sup> Hansell, *Germany and Japan*, p. 228.

<sup>78</sup> Craven and Cate, *Army Air Forces*, vol. 5, p. 625.

<sup>79</sup> Letter, Giles to LeMay, 17 April 1945, Arnold papers, box 107.

To make sure this contribution would be well noticed, the air staff arranged for a film crew and noted film-maker to fly to the Marianas to create a full-colour motion picture of the bombing. The navy had just made a full-colour film, and the air staff jealously found it 'stupendous' and 'colossal'. Refusing to be outdone by the other branch of service, Giles declared, 'We are not getting this sort of camera shots or at least if we are they are not reaching Washington ... This Headquarters feels that a proper picturization of the effectiveness and conclusiveness of air power is urgently needed.'<sup>80</sup>

LeMay's post-strike evaluations of incendiary attacks described their advantages in great detail. His report on the Tokyo raid emphasized the vastly improved weather conditions, bomb load increases, and bombing accuracy of the new low-level firebombing policy.<sup>81</sup> Right after the war, in his 'Phase Analysis of Incendiary Operations', he contrasted precision bombing and incendiary bombing. Before the incendiary campaign, morale was low, operational efficiency was suffering, and there was a 'hopeless emotional tone'. Firebombing 'salvaged the morale and fighting spirit of our crews by providing a degree of battle success proportionate to the effort expended. Equally important, especially to the older crews, the B-29 was established as an efficient and reliable combat aircraft.'<sup>82</sup>

There were a few planners, however, who opposed the incendiary campaign. In early June, as the initial six Japanese cities were being finished off, the Joint Target Group (JTG) and General Arnold summoned the directors of the United States Strategic Bombing Survey to discuss Japanese target selection in the light of the survey's recent and extensive research of strategic bombing in Europe.<sup>83</sup> After days of meetings, they prepared a report and sent it to General Arnold, who had just arrived in the Marianas to discuss targeting with LeMay. One of its major themes was the USSBS's strong disagreement with the policy of incendiary bombing. The survey directors had concluded, on the basis of their studies in Germany, that the primary target in Japan should be transportation – the ability to move goods from factories to front lines. Disruption here would have the greatest impact on Japan's war-making ability.<sup>84</sup> Second, they felt that morale bombing would have little effect on Japanese behaviour. Finally, these men had seen the gruesome results of incendiary bombing with their own eyes, having picked through the rubble of German cities that the RAF had burned to the ground; some were morally appalled by such

<sup>80</sup> Letter, Giles to LeMay, undated, LeMay papers, box B11.

<sup>81</sup> Introduction to 'Incendiary Report' on Tokyo, LeMay papers, box 37.

<sup>82</sup> Phase Analysis of Incendiary Operations, 19 September 1945, LeMay papers, box 37.

<sup>83</sup> After the COA handed its final report to Arnold, it was officially disbanded. The Joint Target Group took over further targeting analysis; some members from the COA were placed in the JTG.

<sup>84</sup> Even the JTG had come to agree with the survey directors that the COA's much-described 'machine tool home shops' were useless targets.

attacks.<sup>85</sup> In sharp contrast, LeMay handed Arnold his own plans to turn on 25 smaller Japanese cities with firebombs.<sup>86</sup> For the chief of the USAAF, the decision was simple. The benefits of firebombing were too spectacular to halt.<sup>87</sup>

Arnold was continually elated as the smaller population centres of Japan were levelled during the summer. His diary of the Potsdam Conference of July 1945 is rich with references to the bombing. During the trip he showed off pictures of B-29 damage to Japanese cities, and on 23 July even let slip his lofty goal of winning the war without invasion. When Stalin, Churchill, and Truman toasted their next meeting in Tokyo after the end of the war with Japan, Arnold 'told Stalin, the Prime Minister and the President that if our B-29s continued their present tempo there would be nothing left of Tokyo in which to have a meeting'. And to his staff, Arnold was so confident in his AAF successes that he told them, 'The war with Japan is over as far as creative work is concerned. All of our planning should be directed toward the future.'<sup>88</sup>

Arnold was right. The last piece of real creativity the air force had needed was LeMay's supremely effective tactical modifications in the days before the Tokyo raid. It is important to note that no one ever directly gave the order to begin the low-level incendiary attack of Japan until LeMay, the general in the field, ordered his planes off the runway at 17.36 on 9 March – and then only after the raid's success were further attacks scheduled. While experimental firebombing raids were ordered during both Hansell's and LeMay's tenures, they were generally conducted at high altitude during the day, and were often ineffective. While plans to firebomb six major cities had been formulated, no correspondence between Arnold and LeMay prior to the March Tokyo raid mentions an inevitable wholesale urban destruction of the enemy. No plan called for a campaign of such magnitude. There were not even enough incendiaries on the Marianas to attack the initial six cities. Arnold and Norstad just gave orders to produce results, but did not stick their necks out by ordering the incendiary attacks. The Tokyo raid came from LeMay, who, when faced with either losing his job or producing results, decided to take a major risk by discarding AAF tactics in order to shake things up. The destruction he achieved was exactly what Arnold was looking for. And as destruction provided the

<sup>85</sup> Report on USSBS and JTG Conferences, from Memorandum for General Spaatz, 20 July 1945, Spaatz papers, box 21. D. MacIsaac, *Strategic Bombing in World War Two: The Story of the United States Strategic Bombing Survey* (New York, 1976), pp. 99–101.

<sup>86</sup> Kerr, *Flames*, p. 260.

<sup>87</sup> As LeMay proceeded with the attacks, the USSBS directors continued to argue vigorously with the JTG against firebombing policy. In late July their persuasion paid off when a new target directive, lowering industrial areas to fourth priority, was sent to General Carl Spaatz, by then in charge of air attacks against Japan. The directive caused essentially no change in target selection. (Directive to Commanding General, United States Army Strategic Air Forces, 25 July 1945, Spaatz papers, box 21.)

<sup>88</sup> Diary of the Terminal Conference, 23 and 13 July 1945, Arnold papers, box 249.

Air Forces with the results and numbers it needed, destruction then became the goal. LeMay had found the key, and now Arnold just had to open the door to all the treasures for the air force he knew lay beyond.

Thus the rest of the campaign took on a momentum of its own.<sup>89</sup> In only a few months 180 square miles of 67 Japanese cities were obliterated; 2 510 000 homes were destroyed, leaving approximately 30% of the Japanese population homeless. Given the short period of time in which the campaign was carried out, its most devastating characteristic was its lethality. Casualty estimates for the attacks are extremely high and differ markedly from account to account. The figures from the Strategic Bombing Survey range from 268 157 killed to 900 000 killed in the conventional and atomic attacks; 330 000 is the figure most often cited from the survey, but that figure is probably low. Regardless of the inconsistencies, it appears that more Japanese civilians were killed by American weapons than were Japanese soldiers, and firebombing accounted for the majority of those civilian deaths.<sup>90</sup>

It is striking that such a lethal campaign (that led seamlessly to the atomic bombings) sprang from the commander in the field. How was it permitted to originate this way? How could a decision laden with such ethical and political consequences be handed to a young field commander? Where was the personal responsibility and active involvement from above? There was very little. For the most part, discussions of the consequences of killing civilians on such a mass scale simply did not take place within the chain of command that held authority over the Mariana operations. Arnold, operating out of the Pentagon, placed no constraints on LeMay's policies because he had no moral reservations of his own toward the bombing. Even as the USAAF faced controversy over Dresden and attempted to justify it as a military target, Arnold wrote, 'We must not get soft – war must be destructive and to a certain extent inhuman and ruthless.'<sup>91</sup> But he put these words into practice much more in Japan than in Germany. He believed he was destroying Japanese war-making capacity with the firebombing, and thus was saving American lives in the long run. During the onset of the fire campaign, US Marines were taking heavy casualties at Iwo Jima, for the sake of the air force. Thus the possibility of an accelerated victory with few losses was justification enough. After the initial fire raids, Arnold

<sup>89</sup> This blind reliance on destruction is further evidenced by the fact that the USA engaged in an area bombing campaign against Formosa, an enemy-occupied territory, during the spring and summer of 1945, obliterating a handful of its cities. Not only did these attacks destroy military targets, but they were planned to 'impose upon the enemy, through destruction of housing and municipal services, a serious loss of labor'. Now the USAAF was waging a war against friendly civilians in occupied territory (Craven and Cate, *Army Air Forces*, vol. 5, p. 485).

<sup>90</sup> United States Strategic Bombing Survey, *Summary Report: Pacific War* (Washington, 1946), p. 20; USSBS, *The Effects of Strategic Bombing on Japanese Morale* (Washington, 1947), pp. 194–95; and Sherry, *Rise*, pp. 314–15. Sherry's footnote on p. 413 provides an excellent discussion of the different casualty estimates.

<sup>91</sup> Arnold, quoted in Sherry, *Rise*, p. 262.

called for the further destruction of ‘whole industrial cities’, and understood and agreed that civilians would be a target.<sup>92</sup> In his final *War Report* he concluded that, ‘in addition to the destruction of industrial installations, the casualties caused had significant effects in the dislocation of industrial manpower and on enemy morale.’<sup>93</sup> LeMay then, unconstrained from above, addressed the issue (unsurprisingly) as a field commander would – with maximum effort. If achieving results was the only thing expected of him, then results were the only criteria he took into consideration. ‘We knew we were going to kill a lot of women and kids when we burned that town. Had to be done ... To worry about the *morality* of what we were doing – Nuts.’<sup>94</sup>

Perhaps LeMay did not need to worry about anything other than operations in the theatre, but there were others who thought that a strategic shift with such consequences could not be left to the military. At the same time that the COA forwarded its final report to Arnold, the general received a letter from presidential science adviser Vannevar Bush. In it was enclosed a memorandum from Raymond Ewell of the National Defense Research Committee that strongly advocated the use of firebombs against Japanese cities immediately. Bush was Roosevelt’s chief scientific advisor on the development of the atomic bomb, and just two weeks earlier had prepared a paper for the secretary of war, Henry Stimson, that suggested the bomb be demonstrated to Japan before it was used on a city. Bush must have seen the same moral ramifications of firebombing Japanese cities, because, in his letter accompanying Ewell’s memorandum, he stated that ‘the decision on the humanitarian aspects will have to be made at a high level if it has not been done already’.<sup>95</sup> Bush almost certainly meant Stimson or Roosevelt. Yet there is no record of Arnold clearing the plan ‘at a high level’, or at least any level higher than his own. In fact, Arnold met with Stimson shortly after he received the final COA report; the two spoke of B-29 progress, but Arnold mentioned nothing of the possible policy switch.<sup>96</sup>

That Arnold could sidestep Stimson and hand LeMay such responsibility for decisions that would reverberate well outside the theatre

<sup>92</sup> Letter, Arnold to LeMay, 21 March 1945, LeMay papers, box B31. In a memorandum explaining why the AAF was focusing its efforts on just a few cities (at first), Arnold named the population and number of workers in these cities right next to the industrial target numbers. (Memorandum for the Chief of Staff, 9 June 1945, Arnold papers, box 114.)

<sup>93</sup> General H.H. Arnold, Admiral E.J. King, and General G.C. Marshall, *The War Reports* (Philadelphia, 1947), p. 440.

<sup>94</sup> LeMay, *Mission*, pp. 384, 383.

<sup>95</sup> Kerr, *Flames*, pp. 85–87.

<sup>96</sup> Or at least Stimson did not mention urban area targeting in his notes of the meeting in his diary. Considering his uneasiness over urban area bombing, one must assume that he would have noted this had Arnold brought it up. Furthermore, that Arnold did not even feel the need to mention firebombing to Stimson lends only more credence to the fact that the campaign was by no means inevitable at the time. (Stimson diary, 18 October 1944, Sterling Memorial Library, Yale University, New Haven, Connecticut, Henry L. Stimson papers, HR-51, roll 9.)

was possible only because senior leaders were not engaged. It was Henry Stimson's job, as secretary of war, to oversee the actions of the military. He ought to have monitored such an extraordinary shift in approaches to strategic bombing and considered its moral implications. Arnold gave him few details, and Stimson ought to have asked more questions. What is ironic is that Stimson was, in both position and mindset, the ideal leader to call into question the indiscriminate bombing of civilians. He had travelled extensively in the far east, and had told President Roosevelt that it was wrong to think that Japan was 'a nation composed wholly of mad fanatics of an entirely different mentality from ours'.<sup>97</sup> He was one of the few moralists in the high command and had expressed concerns about the civilian bombing of Dresden. His diary entries show that he gave considerable thought to the killing of innocents. On 25 April 1945, when he met with President Truman to discuss the atomic bomb project, he handed the President a memorandum that declared, 'Our leadership in the war and in the development of this weapon has placed a certain moral responsibility upon us which we cannot shirk without very serious responsibility for any disaster to civilization which it would further.'<sup>98</sup> A few weeks later, in a letter to the President, he added, 'The reputation of the United States for fair play and humanitarianism is the world's biggest asset for peace in the coming decades.'<sup>99</sup>

But it was in words only that Stimson held the United States to this reputation. He expressed his anxiety to Truman to 'hold our Air Force, so far as possible, to the "precision" bombing which it has done so well in Europe'.<sup>100</sup> However, it was not until June 1945 that he posed a question to Arnold about the firebombing attacks, a question that should have been asked nearly three months earlier, and that is almost inexplicable in the context of the mammoth incendiary campaign already in full swing: 'I told him of my promise from [Assistant Secretary of War for Air Robert A.]. Lovett that there would be only precision bombing in Japan and that the press yesterday had indicated a bombing of Tokyo which was very far from that.' Stimson asked 'to know what the facts were'. Arnold's response emphasized the rationale that the AAF had used internally – the dispersal of industry – and he added 'that they were trying to keep [civilian casualties] down as far as possible'. In response the only constraint Stimson applied was ordering Arnold that 'there was one city that they must not bomb without my permission and that was Kyoto'.<sup>101</sup>

Stimson's diary entries seem to point to the fact that he deluded himself into believing the firebombing raids were being conducted discriminately. He must have overlooked a wealth of contrary evidence

<sup>97</sup> Memorandum of 2 July 1945, quoted in Schaffer, *Wings*, p. 167.

<sup>98</sup> Memorandum, Stimson to Truman, Stimson diary, 25 April 1945, Stimson papers, HR-51, roll 9.

<sup>99</sup> Letter, Stimson to Truman, Stimson diary, 16 May 1945, Stimson papers, HR-51, roll 9.

<sup>100</sup> *Op. cit.*

<sup>101</sup> Stimson diary, 1 June 1945, Stimson papers, HR-51, roll 9.

(such as headlines in newspapers) to maintain the view that the AAF was not targeting civilians. His own words prove that he knew about the incendiary campaign. Shortly after the 9 March Tokyo raid, he said that he ‘thought it appalling that there should be no protest in the United States over such wholesale slaughter’.<sup>102</sup> And in Arnold’s diary of the Potsdam Conference, the general wrote on 23 July that he had a meeting with the secretary regarding the psychological reactions of the Japanese to the firebombing assault.<sup>103</sup> Stimson certainly had the power to end the firebombing, as he successfully denied the AAF permission to attack the city of Kyoto, but his failure to curtail the incendiary bombing of nearly every single other sizeable Japanese city is evidence of the fact that he must have been turning a blind eye to the mass destruction. The advocate for ‘moral responsibility’, ‘fair play and humanitarianism’ allowed the AAF to bomb without constraint as he let top-level decisions sift down the chain of command. Clearly the ‘promise’ Stimson had received from Lovett guaranteeing only precision bombing did not reflect reality. And Arnold’s claim that the USAAF was keeping civilian damage down to a minimum is incredibly hard to believe in the face of a campaign that was on its way to destroying 67 Japanese cities. But Stimson was not minding the store.

This is not the way a government ought to make politico-military policy. The departure from high-altitude precision bombing of military objectives represented a stunning shift in military strategy, but had ramifications outside the military realm. Yet the documentary record does not reveal a campaign that was meticulously planned at high levels and ordered by senior leaders. Yes, plans to firebomb six cities had been formulated, and they played a role. And other factors described in previous literature, such as racism, vengeance, and weariness over a protracted war, tore down constraints that had kept such brutality in check over Germany. But these factors do not paint the whole picture. The campaign stemmed directly from the immediate need to prove strategic bombing’s usefulness. When precision bombing was not working in the bad weather, and the army was preparing for a costly invasion, Arnold, ‘being the impatient man that he was’, felt he was out of time.<sup>104</sup> To keep his B-29s and to prove the USAAF’s abilities, Arnold just demanded numbers, results he could show off, pictures he could display – bomb tonnage, sortie rate, area destroyed. He called for results, but gave no direct orders as to how to achieve them. Instead, he installed a field commander whom he viewed as his best operator, and sent him to the Marianas with a blank cheque in his pocket.

<sup>102</sup> Stimson, quoted in P. Wyden, *Day One: Before Hiroshima and After* (New York, 1984), p. 185.

<sup>103</sup> Diary of the Terminal Conference, 23 July 1945, Arnold papers, box 249.

<sup>104</sup> Interview with Curtis LeMay, March 1970, Air Force Historical Research Agency, roll 43824.

It is for this reason that history has deemed LeMay synonymous with firebombing. After all, he did find himself in the unusual position of being able, in just a few weeks of tactical preparation, to alter air force strategy completely. Impossible in the cumbersome and logistically dependent army and navy, LeMay's rapid and ingenious decisions within the theatre radically changed how the US projected its power. But to neatly compartmentalize the deaths of hundreds of thousands of Japanese civilians solely with LeMay is an oversimplified view of the history, accomplished easily, however, because Arnold and Stimson died so soon after the war ended, and LeMay remained boastfully proud of the firebombing until he died in 1990. Responsibility for and association with the incendiary campaign lie as much, if not more, with those who oversaw LeMay in the chain of command, whether they practised oversight or not.

Viewed in the light that LeMay and especially Arnold made military decisions in large part to further their political goals, the conduct of the USAAF was egregious. There was not a plan formulated that called for firestorms in 67 Japanese cities, and there was no consensus decision even to attack the initial 6. Bombs hit factories and home shops, but they also hit hospitals, schools, and homes. In these buildings were mostly women, children, and old men. Arnold knew this, yet he went ahead, describing the raids in triumphant terms. After all, Arnold thought, regardless of what the USSBS was arguing, how could such destruction not be helping to win the war? Secretary Stimson was the man in the strongest position to ask if it was really effective or morally acceptable to kill 100 000 civilians in one night for the purpose of burning down machine-tool home shops. He was the highest ranking individual to serve for the campaign's entirety, but he let himself fall inexcusably out of touch. Regardless of whether or not he would have supported firebombing in the end, there is no evidence he pressed for alternative scenarios and time frames or discussed the consequences with other advisers and military planners. One would like to see some sort of personal responsibility in his memoirs for embarking on the most lethal air campaign in history. There is none. President Roosevelt, who died in declining health only a month after the campaign began, was equally removed from the process, and probably believed that firebombing would end the war sooner and save American lives.<sup>105</sup> Arnold, because he was so anxious for the USAAF to prove a point, was not going to prioritize the moral and political ramifications. Instead, these grand decisions were made at the operational level, and destruction went unchecked.

Did this devastation really contribute to a swift end to the war? Was it in any way efficient or expedient to attack 67 cities? The evidence argues against it. The COA recommended urban area attack of only 6 major Japanese cities, not 67. According to Lieutenant Charles Hitch

<sup>105</sup> Schaffer, *Wings*, p. 171.

of the COA, 'It is clear from the employment estimates which we have made with OSS that ... six cities are the only six that will give a very important return to [urban area] attack.'<sup>106</sup> Furthermore, it appears that the arguments against firebombing advanced by the USSBS over the summer were correct. The Japanese home industry factory feeder system surfaced as a justification for the firebombing attacks nearly every step of the way within the COA and USAAF, and even after the war Curtis LeMay described all the drill presses he saw still standing among the residential destruction of Yokohama. To win the war, those home industries had to be erased.<sup>107</sup> However, after the war the USSBS concluded that 'by 1944 the Japanese had almost eliminated home industry in their war economy', an argument it had made loudly (with JTG support) during the course of the campaign.<sup>108</sup> According to the Survey, while air attacks 'contributed a substantial percentage to the overall decline in Japan's economy, in many segments of that economy their effects were duplicative' because of the naval blockade. '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 munitions plants low in steel and aluminum.'<sup>109</sup> In other words, the urban area attacks burned down factories that were closed and killed workers who had already lost their jobs.

Arnold and LeMay knew that the wartime studies of the COA and USSBS predicted such a diminishing industrial impact from the extended firebombing campaign, but they had no intention of curtailing the assault. They, unhindered by political leaders above, would not abandon the newsreel impact of the death and destruction wrought by the raids, because they knew well what collateral benefits would result – from psychological effects on the Japanese, personal credibility, inter-service triumph and expenditure justification, to the ultimate goal of air force autonomy. By 1945 the Pandora's box of total war was open, and required skilful and determined leadership to control it. But senior political leaders abrogated this responsibility in the skies over Japan, and devastation followed.

<sup>106</sup> Minutes of COA meeting, 27 September 1944, Air Force Historical Research Agency, roll A1005.

<sup>107</sup> LeMay, *Mission*, p. 384.

<sup>108</sup> United States Strategic Bombing Survey, *Summary Report: Pacific War*, p. 18.

<sup>109</sup> *Op. cit.*, p. 19.