

BOMBS AWAY: WHAT THE HELL

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I. Childhood

- A. WWII airplanes and Cold War attitudes fresh
- B. All airplane models, mostly propeller, mostly military. \$0.98
- C. Bombers vs fighters: Bomber stories prevalent - Doolittle Raid; book report
 - 1. Pretend to be bomber guy in snowsuit, "bailing out" on swings

Then...read *Masters of the Air ...America's Bomber Boys Who Fought the Air War Against Nazi Germany*...and was very disturbed at the conclusions the authors had about the morbidity and mortality of bombing.....my education on this has been fascinating and the rabbit hole of all rabbit holes!

Sir Robert Saundby...

"The subject of air bombardment is seldom discussed objectively and reasonably. It arouses all kinds of illogical antagonisms and emotional responses. "

"When these people descend to the level of rational argument, the commonest objection to air bombardment is that it involves civilians in war, whereas they have a right to be treated as noncombatants."

WHAT IS AERIAL BOMBING

Tactical bombing

Tactical bombing is aerial bombing aimed at

- targets of immediate military value, such as combatants, military installations, or military equipment.
- Tactical close air support attacking targets nearby friendly ground forces, acting in direct support of the ground operations.

Strategic Bombing

Strategic bombing involves

- attacking enemy cities and factories, to cripple future military production
- enemy civilians' will to support the war effort, to and to
- demoralize the enemy so that peace or surrender becomes preferable to continuing the conflict.
- debilitate the enemy's long-term capacity to wage war,

WHAT AIRCRAFT

Generally speaking, all military aircraft fall into one of the following categories:

- Fighters**, which secure control of essential airspaces by driving off or destroying enemy aircraft;
- Bombers**, which are larger, heavier, and less-maneuverable craft designed to attack surface targets with bombs or missiles;
- Ground-support, or attack, aircraft**, which operate at lower altitudes than bombers and air-superiority fighters and attack tanks, troop formations, and other ground targets;
- Transport and cargo planes**,
- Helicopters**,
- Unmanned aerial vehicles**, which are remotely controlled or autonomously guided aircraft that carry sensors, target designators, electronic transmitters, and even offensive weapons.

...we will be concentrating on **BOMBERS**

HOW DID CIVILIANS BECOME CONSIDERED COMBATANTS: A TIMELINE BEFORE WWII

A) Conventional Warfare - war for soldiers only

in Europe in the *Middle Ages*, there came into being a *system of "conventional warfare"* waged by *standing armies of professional soldiers*. During this period, the proper forms, and ceremonies of war of those times were taken seriously by those professional soldiers.

The conventions of war were rather like a set of *trade union rules*, drawn up to make the profession of soldiering tolerable. The forces on each side being well-defined and fight by using weapons that *target primarily the opponent's military*.

Generally speaking, a fairly clear *distinction was drawn between combatant and noncombatants* (yet there *were* occasions when the civilian inhabitants were plundered, ill-treated, and even slaughtered).

B) Character of War Altered - war includes soldiers and civilians

Napoleon Bonaparte, completely altered the whole character of war (cir. 1800)

In France the professional army, devoted to conventional warfare, was replaced by the *levée en masse*, the "mass uprising" or "nation in arms".

All nations began to raise large conscript armies. War became far more serious and *pervaded the whole life of the nation and became the affair of the whole population*.

The German **General Karl von Clausewitz in his book "On War" (1820s)** expanded on the theory of war originated by Napoleon (he was about 10 yrs younger than Napoleon).

Clausewitz believed that *war in the future*, when great powers were engaged, would be *total* and absolute. It would involve not only the armed forces, but the whole nation. Successful outcome would, therefore, would depend upon the the involvement of everyone.

He insisted that war was now:

- a violent clash between *nations* in arms. War could never be humanized or civilized, and
- that, if one side attempted to humanize war, or make it more civilized, that side was likely to be defeated.

Clausewitz had no faith in the reliability, in time of war, of any international rules or agreements since no nation facing the possibility of defeat would allow itself to be bound by them.

Thus by the *mid 1800s*, scholars identified **total war** as a separate class of warfare. In a total war, any and all civilian-associated resources and infrastructure are legitimate military targets. The differentiation between combatants and non-combatants are now diminished, as nearly everyone, including non-combatants, are considered resources that are used in the war effort.

C) The Beginnings of Aerial bombing: WWI

Criticism of bombing began with the first dropping of an explosive weapon from an aircraft. Four hand grenades were dropped by an Italian pilot on 1 November 1911 during the Italian-Turkish War in Libya.

Zeppelin bombing

These were generally used for tactical bombing; the aim was that of directly harming enemy troops, strongpoints, or equipment, usually within a relatively small distance from the front lines. Eventually, attention turned to the possibility of causing indirect harm to the enemy by systematically attacking vital rear-area resources.... the evolution of strategic bombing.

By the end of the war, 51 raids had been undertaken, in which 5,806 bombs were dropped, killing 557 people and injuring 1,358.

The late Zeppelin raids were complemented by the German Gotha bomber, which was the first heavier-than-air bomber to be used for strategic bombing. As the war escalated, specialized aircraft and dedicated bomber squadrons were in service on both sides.

The raids generated a wave of *hysteria*, fueled even more by the media. There arose a new realization in the British establishment that bombing could undermine the home front, and even prompt civilians to call for surrender.

IMAGE ZEPPLIN RAIDS

D) Theorists of aerial bombing 1920's ..the development of Aerial Strategy for Total War - Clausewitz in the 20th Century

- 1) Italian General Giulio Douhet (Giulio du-wet)
- 2) British Hugh Trenchard
- 3) General Billy Mitchell in the United States.

Bringing some of Clausewitz' theories forward, These new theorists furthered the notions that *aerial bombardment of the enemy's homeland* would be an *important part* of future wars. Not only would such attacks weaken the enemy by destroying important military infrastructure, they would also break the morale of the civilian population, forcing their government to capitulate.

1) Italian General Giulio Douhet

Italian General Giulio Douhet asserted in his book *Command of the Air* (1921), the basic principle of strategic bombing.

Douhet: Air power was revolutionary because:

- it *operated in the third dimension*. Aircraft could fly over surface forces, relegating them to secondary importance. The vastness of the sky made defense almost impossible.
- Air power could destroy a country's "vital centers".
- Armies would become superfluous because aircraft could overfly them and attack these centers of the government, military and industry freely.
- The essence of air power was the offensive.
- The only defense was a good offense.
- The air force that could achieve command of the air by bombing the enemy air arm into extinction would doom its enemy to perpetual bombardment.
- Command of the air meant victory. As soon as one side lost command of the air it would capitulate rather than face the terrors of air attack. In other words, the enemy air force was the primary target. A decisive victory here would hasten the end of the war.
- Targeting was central to this strategy; industry, transport infrastructure, communications.

Douhet believed in **Total War**.

-He argued for targeting of the civilian population as much as any military target, since a nation's morale was as important a resource as its weapons.

-The entire population was in the front line of an air war and they could be terrorized with urban bombing.

-The infliction of high costs from aerial bombing can shatter civilian morale, the "will of the people" and pressure their government to pursue peace.

-He envisaged future wars as lasting a matter of a few weeks. While each opposing Army and Navy fought an inglorious holding campaign, the respective Air Forces would dismantle their enemies' country,

He proposed an independent air force composed primarily of long-range load-carrying bombers. Attacks would not require great accuracy.

On a tactical level he advocated using three types of bombs in quick succession; explosives to destroy the target, incendiaries to ignite the damaged structures, and poison gas to keep firefighters and rescue crews away.

Douhet's theories and proposals *were hugely influential among air force enthusiasts* in France, Germany, and the Us, promoting that the bombing air arm was the most important, powerful, and invulnerable part of any military.

As a result of Douhet's proposals, air forces allocated greater resources to their bomber squadrons than to their fighters, and the 'dashing young pilots' promoted in the propaganda of the time were invariably bomber pilots.

2) British Hugh Trenchard

The British Royal Flying Corps and Royal Naval Air Service of the Great War had been merged in 1918 to create a separate air force, Royal Air Force.

Air Chief Marshal Hugh Trenchard, believed the key to retaining the newly created Royal Air Force independence from the army and navy was to lay stress the unique ability of a modern air force to win wars by **unaided strategic bombing**.

The Trenchard School theories of bombing as a military strategy became an effective and efficient way for the British to police, "**Air Control**", their Middle East protectorates in the 1920s. Fewer men were required as compared to ground forces.

Arthur Harris, a young RAF squadron commander (later nicknamed "Bomber" Harris), reported after a mission in 1924, "The Arab and Kurd now know what real bombing means, in casualties and damage.

Thus, strategic bombing became a military strategy used in **total war** with the goal of defeating the enemy by destroying its morale, its economic ability to produce and transport materiel to the theatres of military operations, or both.

ATTEMPTS TO INCLUDE AIR WARFARE IN THE LAWS OF WAR- HAGUE, Reactions to WWI: The Inter-war years

It has often been commented that creating laws for something as inherently lawless as war seems like a lesson in absurdity.

But, based on the adherence to what amounted to *customary* international law by *warring parties* through the ages, it was believed that codifying laws of war would be beneficial.

A. The General Laws of Warfare

1. Customary Ideas of War

The very **idea of a right to war** is based on a customary idea of war, defined as an **armed conflict, limited in space, limited in time, and by its objectives.**

The *central principles* underlying laws of war are:

- War begins with a declaration (of war), ends with a treaty (of peace) or surrender agreement, an act of sharing, etc.
- Wars should be limited to achieving the political goals that started the war (e.g., territorial control) and should not include unnecessary destruction.
- Wars should be brought to an end as quickly as possible.
- People and property that do not contribute to the war effort should be protected against unnecessary destruction and hardship.
- Facilitating the restoration of peace.

2. Just War Doctrine: **Jus in Bello** - Preservation of the distinction between civilians and military combatants

The distinction between *civilians and combatants* has often been unclear. Even though there were some morality rules regarding civilians in war going back to the Greeks, slaughter after overcoming a besieged city was commonplace into the 1600s Thirty Years War.

That behavior of slaughter of the vanquished was generally recognized as *wrong* in some fundamental way, and *that recognition* lay at the basis of what was claimed to be “natural law” or developed as “international humanitarian law”.

In the west, there has been a general agreement that the **evil of war should be kept at a minimum.**

To satisfy the **Just War Doctrine**, *criteria must be met* for *jus ad bellum*, recourse to war; and *jus in bello*, the conduct of war,

Jus ad Bellum - This imposes **limitations** on recourse to war) and on the waging of war once it is deemed *necessary (jus in bello)*.
(Necessity being subjective)

-Jus in Bello: War is limited by imposing constraints on the conduct of hostilities, Jus in bello. These constraints:

So...**civilians** have become a **target** largely because modern technology makes *civilians instrumental in warfare*.

The growing dependence of warfare on society as a whole — especially the role of labour in arming a nation — rendered the *civilian-combatant distinction questionable*.

The status of combatants and civilians in “guerilla warfare” became an issue in the late 19 century, WWI, and in the later colonial struggles. These discussions helped erase the distinctions between the people and the army. *Partisans took to the forests with the intent to kill. Civilians took to the factories*.

Modern warfare was so dependent upon war production at sites far away from the fighting that the concept of a front line tended to seem irrelevant. In war, destroying the *industrial capacity* of its adversary seemed to be a *standard goal*, since that seemed such an integral part of the military effort.

The question became: Does that include attacking the *civilians who worked in such production facilities?*

International Law contains the Law of War:**The Just War**

-regulates the conditions for **initiating war (*jus ad bellum*)**, such as to defend oneself from a threat or danger, and the

-regulates the **conduct of warring parties (*jus in bello*)**, which involves behaving as soldiers and where all violence is not allowed.

3. International Law also contains the **International Humanitarian Law**

-military necessity,

-distinction and

-proportionality;

B. More Rules Were needed to address the new war component: Air Warfare

1. 1923 Hague Rules of Air Warfare: A historic set of rules and guidelines

After WWI, with the rapid development of aircraft and aerial warfare. it became apparent that the **Hague II 1907 Laws and Customs of Land Warfare (Hague IV) and Sea Warfare (IX) declarations**:

-Prohibiting the bombardment of undefended places,

-Prohibiting the Discharge of Projectiles and Explosives from Balloons

... **would be inadequate**.

1923 Hague Rules of Air Warfare Draft Articles Proposed ...

These Draft Articles were basically trying to expand the International Humanitarian Law to apply to Aerial Bombardment

Specifically:

-Aerial bombardment *is legitimate* only when directed at a military objective, an object of which the destruction or injury would constitute a distinct military advantage to the belligerent.

-*objectives*: military forces; military works; military establishments or depots; factories constituting important and well-known centers engaged in the manufacture of arms, ammunition, or distinctively military supplies; lines of communication or transportation used for military purposes.

-If the objectives cannot be bombarded without the *indiscriminate* bombardment of the civilian population, the aircraft must *abstain* from bombardment.

Aerial bombardment for the purpose of terrorizing the civilian population, of destroying or damaging private property not of a military character, or of injuring non-combatants *is prohibited*.

The bombardment of cities, towns, villages, dwellings, or buildings not in the immediate neighborhood of the operations of land forces *is prohibited, but is legitimate* provided that there exists a reasonable presumption that the military concentration is sufficiently important to justify such bombardment, having regard to the danger thus caused to the civilian population.

A belligerent State is liable to pay compensation for injuries to person or to property caused by the violation by any of its officers or forces of the provisions of this article.

The 1923 Hague Rules of Air Warfare convention's proposed set of Laws were, however, **never adopted in legally binding form — as all major powers criticized it as being unrealistic. Planes and theories of use were developing too fast for anyone to want to commit.**

In future aerial warfare, The Hague 1923 Draft Articles *did* provide the basis for judging the appropriateness of air warfare actions, especially bombing practices.

SO, A SUMMARY OF LAWS AFFECTING AERIAL WARFARE ..THUS FAR

1. Air warfare must comply with the **general Laws of War**, the **Just War**, because unlike the war on land and at sea—***there are no treaties specific to aerial warfare.***

2. Warfare must also comply with the **principles of International humanitarian Law**:

-**military necessity**: An action must be intended to help the military defeat the enemy;

-**distinction**: it must be an attack on a legitimate military objective, - -

-**proportionality**: The harm caused to civilians or civilian property must be proportional and not excessive in relation to the concrete and direct military advantage anticipated.

Thus diplomatic attempts to update international humanitarian law to include aerial warfare, it was not updated before the outbreak of World War II.

In the absence of specific laws relating to aerial warfare, the belligerents' aerial forces at the start of World War II used the **1907 Hague Conventions (rules for land and naval operations)— the only existing modern rules signed and ratified by most major powers — as the *customary standard to govern their conduct in warfare.***

!!!!As a result, these conventions were interpreted by both sides to allow the indiscriminate bombing of enemy cities throughout the war.

!!!!Again, this means that aerial bombardment of civilian areas in enemy territory by all major belligerents during World War II was not prohibited by positive or specific customary international humanitarian law.

INTERWAR YEARS: Airplane Development

In the brief space of 15 years, airplane development went from the Wright Brothers' first powered airplane flight to the WWI's final iterations of the fighter plane and bomber.

In WWI - Although still dangerous to fly, the airplane now represented an increasingly reliable and formidable third dimension in armed conflict.

The **interwar years** saw continued development of the airplane.

Pic: Maiplane; DC-1; Hughs H-1; German Fokker Tri-motor; British Hawkers

With these new military capabilities of the airplane came the opportunity to think of new ways to use them. The theoretical strategies of Aerial Warfare (Douhet, Trendchard) of the interwar years could now be seen to be applicable to present even more clearly.

INTERWAR YEARS: Ideas of Bombing :

A. United States: The Bomber Mafia

In 1920, the Air Service Field Officers School, later renamed the **Air Corps Tactical School (ACTS)**, was established at Langley Field, Virginia.

The faculty of the School was dominated by devotees of Brig. Gen. William L. "Billy" Mitchell. Mitchell was an advocate of greatly expanding the role of the bomber force.

Douhet's theories were well received at the School where a core group of instructors adopted Douhet's theories as the *basis* for strategy.

By 1926 Air Corps Tactical School instructors started advocating that, in addition to striking at *tactical* military tactical targets, airplanes could bombard manufacturing facilities and other *strategic* targets.These concepts developed into the idea of **Daylight Precision Bombing**

The list of other advocates of precision daylight bombing at the School reads like a who's who of senior World War II U.S. Army air officers—Henry H. Arnold, Ira Eaker, Haywood Hansell, and James H. Doolittle, among others.

They came to be known as the **"Bomber Mafia"**

These folks were the core of US bomber advocacy The Bomber Mafia devised a strategy of pin-point bombing, **precision daylight bombing**, that targeted the "pinch points" of the enemy economy and the production of weapons deep within enemy-held territory.

Though unproven, the **major attraction** of this precision strategic bombing doctrine was that a war was expected to be **won relatively quickly, with minimal casualties**, and that grinding, static trench warfare as seen in World War I could be avoided.

This theory was **in contrast to the contemporary discussions by the area/terror bombing theorists**, who were thinking of the aerial bombardment and Area bombardment, **as it was done in the previous war.**

The US Bomber Mafia agreed with Britain's Stanley Baldwin only in that the bomber would prevail in its mission. They intended the mission to be *against military and industrial targets, not populations.*

The ACTS officers who believed in the heavy bomber doctrine realized the need to expend the **majority of its resources** in amassing a **fleet of self-defending heavy bombers.**

In **July 1941**, Members of the "Bomber Mafia" produced the **Airpower War Plans (AWPD-1)** that **initially was the only plan** which guided the wartime expansion and deployment of the Army Air Forces.

The doctrine (originally known as the "industrial web theory") became the primary airpower strategy of the United States in the planning for World War II.

AWPD-1, provided a comprehensive air plan which was designed to defeat the Axis powers. The plan emphasized using *Heavy Bombers* to carry out *Precision Bombing* attacks as the primary method of defeating Germany and its allies.

*(As a **major failing** in their otherwise highly detailed plan, The Bomber Mafia had not considered establishing air superiority as a prerequisite for success. They believed the heavy bomber fleet could protect itself. This contributed to the delay in the development of a long-range escort fighter until two years into the war.)

B. Britain: The RAF and Baldwin...(from the Blitz Companion)

Sir Stanley Baldwin, speaking to the House of Commons in 1932, highlighting the rapid improvements in flight technology, and speedier and more powerful bomber planes, pointed out that **no town was safe:**

I think it is well also for the man in the street to realize that there is no power on earth that can protect him from being bombed, whatever people may tell him. The bomber will always get through.

'The only defense is in offense, which means that you have got to kill more women and children more quickly than the enemy if you want to save yourselves.'

The question is: whose morale will be shattered quickest by that preliminary bombing?'

In formulating a bombing plan on this thread of thinking, there would be a real likelihood of violating the principles laid down in the Hague Draft Conventions on Air Warfare.

In 1934 the National Government initiated an expansion of the RAF.

A British Cabinet planning document in 1938 predicted that, if war with Germany broke out, 35% of British homes would be hit by bombs in the first three weeks.

The fear of aerial attack on such a scale was one of the fundamental driving forces of the appeasement of Nazi Germany in the 1930s.

C. Prelude to WWII

Germany

The Versailles Treaty that ended World War I prohibited military aviation in Germany.

The German civilian airline—Lufthansa—was founded in 1926 and provided flight training for the men who would later become Luftwaffe pilots.

In 1933 Hitler began to secretly develop a state-of-the-art military air force.

When Britain announced it was strengthening its Royal Air Force (RAF), Hitler, announced the Luftwaffe to the world., which was rapidly growing into a formidable air force.

-The bombing of **Guernica, Spain** by the German's Condor Legion (expeditionary Luftwaffe), 1937, supporting the Nationalists in the Spanish Civil War, resulted in its near destruction, with more than 1,000 killed. This received worldwide condemnation, yet was proof of the capability of area bombing and the realization of the fears of the devastation that was to come in the near future.

Sino-Japanese War

The Second Sino- Japanese War, 1937-38, began when Japanese fighter planes engaged in skirmishes with the Chinese forces. Then Bomber air raids devastated many towns and larger cities, notably Chungking, and the then Nanking.

The German and Japanese bombing attracted worldwide condemnation, prompting the **League of Nations** to pass a resolution that called for the **protection of civilian populations against bombardment from the air.**

This, like the 1923 Hague Rules of Air Warfare, was not ratified before war broke out in Europe in 1939.

Franklin D. **Roosevelt** was shocked and angered by the air raids in the latter 1930s, denouncing the bombing.

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

(These words have been returned to since, by critics of American post-war bombing campaigns)

RAF BOMBING WWII

I Will be focusing mostly on the bombing campaigns in Europe, (and later Japan) as those events created the models, and created the issues, seen again in most subsequent Aerial Warfare situations.

(Early Pacific bombing warfare:

Japanese: Pearl Harbor, Singapore, Indochina

-U.S. Now in European War and Pacific War

-Doolittle Raid April 1942 -Tokyo - medium bombers one-way mission

-Midway June 1942

1. Dive bombers sink ships

-All meaning Naval battles will now be decided by air power.)

WWII Early :Germany <- > Britain: Strategic Bombing Design Applied

1939: *The first year of the war in Europe*, strategic bombing was developed through trial and error. The Luftwaffe had been attacking both civilian and military targets from the very first day of the war, when Germany invaded Poland on 1 September 1939.

1940: **Rotterdam** -Before the Nazi area bombing of the center of Rotterdam (surrender had been offered and accepted) on 14 May 1940 the British restricted themselves to tactical bombing west of the Rhine and naval installations.

The day after the Rotterdam Blitz a **new directive was issued to the RAF** to attack targets in the Ruhr, including **oil plants** and other **civilian industrial targets** which aided the German war effort.

1940 Spring/Summer: **Battle of Britain** - A strategic-bombing campaign was launched by the Germans as a precursor to the invasion of the United Kingdom to force the RAF to engage the Luftwaffe and so be destroyed either on the ground or in the air. After an errant bomb hit Berlin, the Germans launched their night time Blitz on London hoping to break British morale and to have the British be cowed into making peace.

Coventry - Biggest air raid outside of London targeted by the Germans was Coventry, center of British arms industry ...night bombing and firebombs..some admittedly missing targets and hitting residential areas. Incendiary conflagration. >500 die. By May 1941...42,000 Britons dead from bombing.

Churchill "Sew the wind...reap the whirlwind." Churchill orders bombing of carpet bombing Germany coastal towns residential areas.

March 1942 Lubeck,Germany. Carpet bombing to break morale of population.

Germany<-> No More Daylight Precision Bombing -> Night Area Bombing

At first the Luftwaffe raids took place in daylight, but changed to night bombing attacks when losses became unsustainable. The RAF, who had *preferred precision bombing*, also switched to *night bombing*, also due to **excessive losses** and the analysis showing **the inadequate effectiveness of RAF Bomber Command precision daylight bombing**.

So, due to the inaccuracy of daylight precision bombing, and unsustainable daylight bombing loss of aircraft.crews ,the RAF adopted a **night area-attack strategy**,

RAF BOMBER COMMAND: BOMBING OF GERMANY AND CONCLUSIONS OF AREA BOMBING

When Bomber Command installed Air Marshall Arthur 'Bomber 'Harris in February, 1942, the area bombing campaign against Germany was significantly ramped up.

His justification was that Nazi Germany had started the war and mass area aerial bombardment would help end it most quickly.

Bomber Command initiated a program of massive air raids to destroy industrial capacity, infrastructure and housing, and to create chaos and submission, the very conditions that Hitler had unsuccessfully attempted to create during the Blitz.

The bombing of German cities represented an intensive campaign of conventional air raids deploying HighExplosive bombs of varying payloads, parachute mines, and incendiary devices.

Many German cities were badly damaged and others bombed close to complete destruction by the Allies.

Cologne

The leadership of the RAF with Harris planned the first signature bombing event, the *Thousand Bomber Raid* on Cologne May1942, (which continued until 17 August). The 1,000 bombers dropped 2,500 tons of high explosives and incendiaries.

Over 3,300 buildings were destroyed, most of them by fires. Large-scale industries were put out of action, roads and railway lines were incapacitated, and the power supply was destroyed in many areas of the city. Over 13,000 homes were completely destroyed, 6,360 were seriously damaged.

These statistics are from an RAF source that notes 'These details of physical damage in Cologne are a good example of the results of area bombing'. The attack on Cologne was *hailed* by Bomber Command and the British government as *proof positive* that the RAF were now *successfully* fighting back against the Germans.

Yet despite such propaganda value, German preparations for the attack on Cologne greatly ameliorated the death and destruction meted out by the raid.

The city had prepared 'public shelters for 75,000 people', with twenty-five deep special bunkers for a further 7,500 (and twenty-nine additional such bunkers in the process of being built). A total of 42,000 small air raid shelters had been provided under or next to houses for apartment buildings or residents. Fourteen auxiliary hospitals had been constructed, giving an extra 1,760 emergency beds.

The estimates of *casualties* in Cologne are, unusually, quite precise. Figures quoted for deaths are "*only*" between 469 of Cologne's population of 700,000.

Hamburg

The raid on Hamburg in the summer of 1943 was the largest following Cologne. The Allies were increasingly deploying phosphorous *incendiary* devices to start fires that spread rapidly, and Hamburg was to suffer hugely from them.

The specific intentions for Hamburg revealed the wider rationale of, and perceived justification for, the area bombing of German cities. On 27 May 1943 Bomber Command emphasized that the total destruction of this city of 1.5 million would achieve immeasurable results in reducing the industrial capacity of the enemy's *war machine*.

Harris: "The 'Battle of Hamburg' cannot be won in a single night. It is estimated that at least 10,000 tons of bombs will have to be dropped to complete the process of elimination. To achieve the maximum effect of air bombardment this city should be subjected to sustained attack.

Intention: To destroy Hamburg."

Bomber Command also emphasized that the effect on German *morale*, which would be felt throughout the country, would play a very important part in shortening and winning the war.

The Hamburg raids lasted for a week and resulted in about 40,000 civilian deaths. Much of Hamburg was razed to the ground by the terrible firestorms which raged through the city. People were burnt to ashes, suffocated by the lack of oxygen, or died from heat exposure.

Dresden

The destruction of Dresden in eastern Germany, the seventh largest city in the country, has been the subject of intense historical attention.

The 'Florence of the Elbe' was subjected to bombing raids on 13–14 February 1945, just a few months before the war in Europe came to an end.

Some historians to interpret the bombing of Dresden as an *unnecessary atrocity* by the Allies.

-David Irving's *The Destruction of Dresden* (1963) claimed that the firestorms in Dresden were the defining action of the allied war on Germany's cities and civilians.

In *Slaughterhouse 5* Kurt Vonnegut, as Billy Pilgrim, emerges from the underground slaughterhouse, where he had heard the bombing overnight, he observes that '135,000 Hansels and Gretels had been 'baked like gingerbread men'. (the original estimate by the President of Police for Dresden of about 25,000 mortalities is probably the most accurate estimate,)

Conclusions: RAF Bombing Campaign Effective?

Historian Henry Probert, in his study of Harris, even includes an evaluation made in 1959 by the Nazi architect and confidante of Hitler, *Albert Speer*, that "the unpredictability and sustained heaviness of the raids caused Germany enormous problems, possibly more so than defeat on the Russian Front."

For Bomber Command, as for Churchill, Eisenhower and Truman, *aerial warfare hastened the end* of the German war, degrading the urban infrastructure and demoralizing its citizens.

However, the Blitz on Britain had demonstrated the *failure* of intentions by Nazi military planners. And, following that pattern, there was *little hard evidence* to support that the Allied aerial bombing had contributed to the demise of Germany.

-Historian Henry Messenger points out that the strategy of *continuous area bombing* has been subsequently proven to have been a *mistake*, 'but during much of the war there was *no way of knowing this*.'

Writing during the early post-war years, military historian Michael Howard argued that air raids, if anything, *initially strengthened morale* by increasing a sense of defiance and hatred of the enemy.

Civilians in the *later stages of war were affected by apathy* and war-weariness, but rarely was this the ultimate defeat of civilian morale.

Despite the complexity of morale and its ultimately resilient nature, some *lessons learned or at least believed to have been learned* from the air raids on Germany were *applied by the Americans to the bombing of Japan* from late 1944.

The campaigns in Japan were to prove that air power could assist in the winning of wars. Incendiaries had a huge and destructive potential.

USAAF DAYLIGHT PRECISION BOMBING: DEVELOPMENT

(..From John T. Correll Oct. 1, 2008)

In addition to the strategical planning of the Bomber Mafia, Precision bombing did not come into its own until the 1930s, with the availability of **high-quality bombsights** from **Norden** and Sperry and the introduction of **faster, longer-ranging bombers**.

A.Norden bombsight

In the 1930s, improvements in bomb sight technology led to enthusiasm for developing a program of precision bombing. In 1940, Theodore H. Barth, president of Carl L. Norden Inc., said that "we do not regard a 15-foot square ... as being a very difficult target to hit from an altitude of 30,000 feet," provided the bombardier was using that company's new M-4 Norden bombsight connected to an autopilot.

Thus the the "we could drop a bomb into a pickle barrel" story, was often told and widely believed.

B. Committed to Precision:

1940, Maj. Gen. Henry H. "Hap" Arnold, Chief of the Air Corps, declared, "The Air Corps is committed to a strategy of high-altitude precision bombing of military objectives."

-Key to this was the push to develop and deploy the new B-17 and B-24 4-engine bomber, armed with the new bombsights.

-The planners knew of the realities of the problems with the pickle barrel accuracy assumptions.

According to data from training and practice bombing in 1940, the average score for an Air Corps bombardier was a circular error of 400 feet, and that was from the relatively forgiving altitude of 15,000 feet instead of 30,000.

The training data also revealed that a heavy bomber at 20,000 feet had a 1.2 percent probability of hitting a 100-foot-square target. About 220 bombers would be required for 90 percent probability of destroying the target. AWP-1 forecast a need for 251 combat groups to carry out the plan.

C. The Mechanics and results of Daylight Precision Bombing

Bombing was a complicated engineering event. Where the bomb hit was a function of the direction and **speed** of the airplane at the moment of release, the aerodynamics of the projectile, and the **wind and atmospheric conditions** while the bomb was in flight.

The limited yield of each of the bombs added to the problem. A 500-pound bomb, standard for precision missions after 1943, had a lethal radius of only 60 to 90 feet. It dug a crater just two feet deep and nine feet wide. With bombing accuracy measured in hundreds of feet, it took a great many bombs to get the job done.

Such **high ratios of ordnance expended to results achieved** were not unusual in war, nor were they unique to AAF bombers in World War II. The Army fired 10,000 rounds of small-arms ammunition for each enemy soldier wounded and 50,000 rounds for each enemy killed. It took the Germans an average of 16,000 88 mm flak shells to bring down a single Allied heavy bomber.

D. USAAF Precision Daylight Bombing campaign in England ran into many start-up problems.

-When Eighth Air Force was set up in England in 1942, its *methods were at odds* with the area night area bombing tactics of the Royal Air Force's "Bomber Harris".

-*Not enough aircraft* and crews for large operations; they were diverted to operations in North Africa in 1942 and early 1943. More than half of his remaining resources were assigned to attacking German submarine pens—a high priority for the British—even though bombing had little effect on these hardened facilities.

- *Bombing accuracy was terrible*. USAAF Daylight Precision Bombing missions over Europe commonly took place in conditions of very poor visibility, with targets partly or wholly obscured by thick cloud, smokescreens, or smoke from fires started by previous raids.

The average circular error in 1943 was 1,200 feet, meaning that only 16 percent of the bombs fell within 1,000 feet of the aiming point.

-The prewar prediction that bombers *could defend themselves* and that fighters could not intercept bombers proved to be *wrong*. The Luftwaffe and ground defenses took a heavy toll on bombers if they ventured without fighter escort deep into hostile territory.

USAAF DAYLIGHT PRECISION BOMBING Turning Point: "PRECISION BOMBING" TO INCLUDE AREA BOMBING

Curtis LeMay

The accuracy and casualty problems demonstrated in '42 and the start of '43 were addressed by Col. Curtis E. LeMay, commander of the 305th Bomb Group at Grafton-Underwood, Britain.

LeMay devised a staggered "combat box" formation.

-It gave the B-17 guns maximum fields of fire for mutual defensive support.

-It created an opportunity to increase accuracy. In this box formation concept, only the leading bomber, in a formation actually utilized the Norden sight. He identified the best bombardiers, made them "lead bombardiers" for the formation, and had all of the aircraft drop their bombs when the lead bombardier did.

But.... even a very tight bomber formation could cover a *vast area, so the scatter of bombs was likely to be considerable.*

LeMay tried out his ideas for improved accuracy and lower loss numbers: The ball bearing plants of Schweinfurt, and the Messerschmitt plants at Regensburg

Schweinfurt-Regensburg...Schweinfurt II - August and October 1943

A failure...poor accuracy...high losses...of 376 bombers 60 lost and up to 95 damaged irreparably. German fighters and flak were unopposed, other than by the "defenses" of the guns of the bombers themselves.

No fighter escort had even deemed necessary, and none had the range for these raids deep into Germany.

Crew losses were in the range of 30%. More than 600 airmen were killed, captured, or missing.

Effect on targeted production was not major or lasting.

After these raids, the Precision Daylight Bombing plan was paused.

image Schweinfurt

image: PLoesti

After Schweinfurt, the B-17s did not again fly deep into Germany until long-range P-38 P 47 and P-51 fighters were available to escort them. The best of the fighters by far was the P-51, which could escort bombers to their most distant targets.

The change in bombing plan for the USAAF came in **early 1944**. Maj. Gen. Jimmy Doolittle became the new commander of Eighth Air Force. Several things had changed.

1) Finally, there were enough bombers to put together large formations. Joint efforts by Eighth and Fifteenth Air Forces put up a 750-bomber mission in January and a 1,000-bomber mission in February.

2) AAF fighters coursed deep into Germany, which improved bomber protection. The fighters' mission was also changed, allowing them to go after the Luftwaffe fighters more aggressively. In a matter of months, they had virtually destroyed the Luftwaffe. When the D-Day invasion landed in June, the Germans were able to launch less than 100 sorties in defense of Normandy.

3) With fighter escorts and suppression of enemy air defenses, ***the aircrew loss rate declined in 1944 and 1945.***

4) **AAF bombing accuracy improved.** By 1945, Eighth Air Force was operating at much lower altitudes and was putting up to 60 percent of its bombs within 1,000 feet of the aiming point, almost four times better than in the dark days of 1943.

USAAF Bombing of Germany: Summary

The initial bomber crew loss rate in the darkest early days of the Eighth Air Force was over 30%, even higher in the start of the programs in 1942.

The 250,000 aircrew members who flew bomber missions in Eighth Air Force in World War II sustained 58,000 casualties—18,000 killed, 6,500 wounded, and 33,500 missing.

For the bomber offensive as a whole, Eighth Air Force lost 4,182 aircraft from a total of 273,841 attacking, a rate of 1.5 percent.

RAF Bomber Command continued its night area bombing. From 1942 on, 56 percent of its sorties were against cities.

RAF's Bomber Command aircraft loss rate for the same period was 2.5 percent.

Overall, less than four percent of US bombs in Europe were aimed at civilians. The main targets for the AAF were marshaling yards (27.4 percent of the bomb tonnage dropped), airfields (11.6 percent), oil installations (9.5 percent), and military installations (8.8 percent).

US BombingEffective or Not?

The 1944 United States Strategic Bombing Survey: Searching for lessons to be applied to future bombing campaigns (e.g. Japan)

Successes

The Survey noted several successes against crucial *industrial areas*:

- **"The Attack on Oil":**

This section of the USSBS presents the statistics for the Oil Plan portion of the bombing campaign against petroleum, oil, and lubrication (POL) products, particularly regarding the Leuna complex that produced a notable portion of the synthetic oil. The survey repeats the Nazi Germany position that the campaign was "*catastrophic*".

- **Ammunition:** Production fell markedly in 1944 and the arms industry shipped bombs and shells packed partly with rock salt, as Germany ran out of nitrate, a vital ingredient. Finally, Albert Speer, head of the Nazi economy, shifted the last nitrogen from the war effort to agriculture because he believed the war was lost and next year's crops were more important.
- **Truck manufacturing** facilities were extensively bombed. Of the top three producers, Opel at Brandenburg, was completely shut down in one raid in August 1944, and never recovered. Daimler-Benz was decimated a month later. The third largest producer, Ford's subsidiary at Cologne was never attacked, but production was sharply cut during the same period by elimination of its component supplies and the bombing of its power sources. By December 1944, production of trucks was reduced to 35 percent of the average for the first half of the year. b damage to its German subsidiary).
- **Submarine manufacturing** was halted.

Failures

The Survey also noted a number of failed or outcomes of limited success:

- **Aviation production:** "In 1944 the German air force is reported to have accepted a total of 39,807 aircraft of all types -- compared with 8,295 in 1939, or 15,596 in 1942 before the plants suffered any attack." According to the report, almost none of the aircraft produced in 1944 were used in combat and some may have been imaginary.
- **Armoured fighting vehicle production** "reached its wartime peak in December 1944, when 1,854 tanks and armored vehicles were produced. This industry continued to have relatively high production through February 1945."
- **Ball bearings:** "There is no evidence that the attacks on the ball-bearing industry had any measurable effect on essential war production."
- **"Secondary Campaigns"** (Operation Chastise & Operation Crossbow): "The bombing of the launching sites being prepared for the V weapons delayed the use of V-1 appreciably. The attacks on the V-weapon experimental station at Peenemunde, however, were not effective; V-1 was already in production near Kassel and V-2 had also been moved to an underground plant. The breaking of the Mohne and the Eder dams, though the cost was small, also had limited effect."
- **Steel:** The bombing greatly reduced production, but the resulting shortage had no contribution to the defeat.
- **Consumer goods:** "In the early years of the war—the soft war period for Germany—civilian consumption remained high. Germans continued to try for both guns and butter. The German people entered the period of the air war well stocked with clothing and other consumer goods. Although most consumer goods became increasingly difficult to obtain, Survey studies show that fairly adequate supplies of clothing were available for those who had been bombed out until the last stages of disorganization. Food, though strictly rationed, was in nutritionally adequate supply throughout the war. The Germans' diet had about the same calories as the British."

On German production

The Survey concluded that one reason *German production rose* in so many areas was in part that the German economy did not go on a complete war footing until late 1942 and 1943. Up until then, factories had been on a single shift in many industries and the German economy was *generally inefficient and not operating at full capacity*.

Commentaries in Support of Successes cited in the United States Strategic Bombing Survey

Richard Overy (1995), *challenged* the early negative ideas .

The air war, he argues:

- caused a *downward spiral of industrial collapse* in Germany, especially when bombing was concentrated on strategic industrial targets.

- The *Oil Offensive of May-Sept 1944* cost Germany 90% of its synthetic *oil production* (on which it relied).

-Without the Oil Offensive? Who knows. German Synfuel production declined only from the second half of 1944. Part of the downturn followed after Romanian oil sources were finally overrun by Soviet troops and Germany was fighting increasingly on two fronts.

(It is all about Oil. ("Oil and War: 10 conclusions from WWII Thunder Said Energy article)

- destroying *railroad lines* severely hampered adequate *fuel* transportation, limiting the use of fighter defenses, which in turn made the American bombing more effective, thus destroying more fuel supplies....

-Bombing demonstrated the hopelessness of the Nazi defense and may have had something to do with the fact that after WWII there was no real defiant nationalism.

It remains amazing to think that the massive and continuous attacks on densely populated areas did not *cut into transport and production* as well as *wearing down industrial workers'* general health and lives.

"by the summer of 1944, the war machine was largely incapacitated, air defenses were faltering, and production began to fall sharply. The defenders of the air war program argued that for sure, the tons of bombs dropped brought about that collapse."

Commentaries in Support of Failures cited in the United States Strategic Bombing Survey

The 1944 *United States Strategic Bombing Survey*-Team member John Galbraith argued that bombing had **achieved far less** of an impact than had been claimed.

"Nothing in World War II air operations was subject to such assault as open agricultural land."

-The Survey found Germany's *war production* was not slowed, and *actually increased* during the time of the most intense bombing.

-In the firebombed cities, displaced workers from the central cities went to work in the war plants on the edge of the cities.

-Other factors, including German military setbacks on the ground played a large role

-the so-called "precision bombing was not precise"

The *major conclusion* of the report was that strategic bombing, particularly the destruction of the *oil industry and truck manufacturing*, had greatly contributed to the success of the Allies in World War II. However, despite the *overall contribution of the bombing*, the survey concluded that the *impact of strategic bombing could not be separated from the general collapse of Germany in 1945.*

The 1944 *United States Strategic Bombing Survey's* negative judgements were for a long time accepted and used in *protesting* Lyndon Johnson's and Nixon's resort to heavy bombing of North Vietnam (and Cambodia, Laos).

..MY TAKE: EARLY ON THE BOMBING PROGRAM WAS COSTLY IN LOSSES, INACCURACY, AND POORLY DESIGNED TARGETS..E.G. SUBMARINE PENS...LATER BOMBING AFFECTING WAR PRODUCTION INFRASTRUCTURE..RAIL, FUEL, COMMUNICATIONS WAS EFFECTIVE.

A BIG DIFFERENCE BETWEEN EARLY FAILURE AND LATER SUCCESS WAS A SNOWBALLING COMBINATION OF THE LITTLE SUCCESSES (FIGHTER ESCORT, E.G.) , and CUTTING OFF FUEL SUPPLIES WHICH ALLOWED THE OTHER FEATURES OF THE BATTLE OF ATTRITION, ON WAR PRODUCTION AND THE ABILITY TO WAGE WAR.

THE ANTICIPATED CONTRIBUTION OF BOMBING TO THE ANTICIPATED COLLAPSE OF MORALE OF THE PEOPLE DID NOT HAPPEN TO ANY GREAT DEGREE.

The Price of Bombing Success

“The issue remains the price of success ...and is always debated....

Allied Air Bombing Costly

- *140,000 British and American airmen died in the attacks.*
- *21,000 planes were lost.*
- *In the Pacific theater, losses were compounded by the lives lost in capturing the island bases close enough to bomb Japan.*

E. JAPAN: Daylight Precision Bombing: ..Becomes Night “Precision” Area Bombing

With the US capture of the Marianas (Saipan, Tinian, and Guam), the B-29s obtained bases from which they could reach almost any target in Japan.

The new B-29 was a new, huge, bomber with vastly increased payload and range capabilities over the B-17 and B-24 used in the earlier war.

Over **Japan**, the **B-29s** encountered numerous **obstacles**.

-The tremendous the **jet stream**. Fierce winds above 25,000 feet that added or subtracted as much as 250 mph to an aircraft's speed relative to the ground. The jet stream pushed the bombers over the target too fast for the Norden bombsight to compensate. Flying against the jet stream, the speed relative to the ground was so slow that the airplanes were vulnerable to ground and air defenses.

The dominant **cloudy weather**. The weather permitted only four days a month of visual bombing.

-The **long distances and high altitudes** consumed so much fuel that the **bomb loads were relatively small**.

-The B29s bombing from China only got close to their target 5% of the time. Operational losses of B-29s were unacceptably high due to Japanese daylight defenses and continuing mechanical problems with the new, tweeky B-29.

-There were frequent aborts and ditch-ings as Twentieth Air Force in the Marianas also worked the kinks out of the new bomber under combat conditions.

-The AAF was under tremendous pressure to produce strategic results and help bring the war in the Pacific to an end.

Curtis LeMay was brought in to take over XXI Bomber Command in January 1945.

LeMay concluded that the techniques and tactics of high altitude daylight precision bombing developed in Europe would not work in bombing Japan.

LeMay switched bombing tactics to nighttime low-altitude nighttime incendiary attacks on Japanese targets.

LeMay commanded subsequent B-29 Superfortress combat operations against Japan, including massive incendiary attacks on 67 Japanese cities ...which were largely constructed of combustible materials such as wood and paper..

This included the firebombing of Tokyo air raid on the night of March 9–10, 1945.

-LeMay ordered the defensive guns removed from 325 B-29s, loaded each plane with Model M-47 incendiary clusters, magnesium bombs, white phosphorus bombs, and napalm, and ordered the bombers to fly in streams at 5,000 to 9,000 feet over Tokyo.

-In a three-hour period, just after midnight on March 10, the main bombing force dropped 1,665 tons of incendiary bombs, **killing 100,000 civilians**, destroying 250,000 buildings, and **incinerating 16 square miles of the central city**. Aircrews at the tail end of the bomber stream reported that the stench of burned human flesh permeated the aircraft over the target.

-It was the **single most destructive bombing raid of the war. with greater indiscriminate loss of life in the than was caused either by the Dresden mission, Hamburg, or the atomic bombs dropped on Hiroshima or Nagasaki**

It was supposedly while touring the firebombed area that Emperor Hirohito came to the conclusion that the war had to end as soon as possible.

-The US was no longer as reluctant as it once had been to bomb enemy cities.

Atomic Bomb?

-The possibility loomed that an invasion of the Japanese home islands would be necessary. Plans projected a landing force of 1.8 million US troops and anticipated massive casualties.

-LeMay and Arnold believed that the incendiary bombing would eventually bring on a Japanese surrender. Gen. George C. Marshall, the Army Chief of Staff, and President Truman were not convinced.

Truman decided to use the atomic bomb.

On August 6 and 9, 1945, the United States exploded nuclear bombs over Hiroshima and Nagasaki, killing 105,000 people and inflicting a psychological shock on the Japanese nation.

Precise figures are not available, but the strategic bombing campaign against Japan, directed by LeMay between March 1945 and the Japanese surrender in August 1945, may have killed more than 500,000 Japanese civilians and left five million homeless.

Some 40% of the built-up areas of 66 of the larger industrial cities were destroyed, including much of Japan's war industry.

BOMBING CIVILIANS: PRECISION BOMBING: COLD WAR ERA

-The age of the massive WWII style strategic bombing campaign had come to an end.

- It was replaced by **even more devastating attacks** using improved targeting and weapons technology.

The Korean War from 1950 to 1953 and American involvement in the Vietnamese War from the mid-1960s until 1973 witnessed extensive air raids whose efficacy and legitimacy questioned and examined at length.

A. Korea

The United States Air Force **at first** conducted only *tactical attacks* against *strategic targets*..

Chinese intervention in the war in November 1950 **changed the aerial bombing policy** dramatically. In response to the Chinese intervention, the USAF carried out an intensive bombing

-Despite a strategic distinction between *legitimate military objectives* and the need to *avoid civilians*, *'a dynamic of escalation'* led to the mass bombing and burning of key cities and the later capital of North Korea, Pyongyang.

-American military leaders, expressed reservations about civilian casualties and the resultant negative propaganda, *calling for precision bombing of military targets*.

The extensive bombing raids on North Korea continued until the armistice agreement was signed between communist and UN forces on July 27, 1953.

Blowback on the area bombings of North Korea:

-American historian Bruce Cumings:

'What hardly any Americans know or remember' is that we carpet bombed the North for three years with next to no concern for civilian casualties. [The] air assaults ranged from the widespread and continual use of fire-bombing (mainly with napalm) to threats to use nuclear and chemical weapon, finally to the destruction of huge North Korean dams in the last stages of the war.

-Military historian **Hastings concludes that the lessons from the Second World War were being unlearned as**

"intensive strategic bombing could kill large numbers of civilians":*without decisive impact upon the battlefield or even upon the war-making capacity of an industrial power. Bombing could inflict a catastrophe upon a nation without defeating it. North Korea was a relatively primitive society which contained only a fraction of the identifiable or worthwhile targets of Germany or Japan."*

B. Vietnam

Strategic bombing of North Vietnam **began as one of restricted target selections** and only a **gradual escalation** of intensity by the Johnson Administration, fearing the entry of China into the war.

The aim of the bombing campaign was to **demoralize the North Vietnamese, damage their economy, and reduce their capacity to support the war** in the hope that they would negotiate for peace. *It failed to do so.*

The Nixon Administration's Operation Linebacker campaigns ramped things up, removing the restrictions that were placed initially, with much heavier bombing campaigns, with B-52 bombers.

Laos was also bombed heavily during the Vietnam War. While originally denied by the US government, Laos contained heavily used supply lines for communist troops and the U's sought to destroy them before they could enter Vietnam and used against American troops. Laos became the most heavily bombed country per capita in the war.

-Area Bombing: a repeated story of arguable military results, morale-busting results vs massive loss of civilian life.

-It becomes clearer in the arc of history that there seems to be a consistent course toward, and the belief, in the use and effectiveness of extensive bombing campaigns

C. Precision Weapons for Bombing: Turning away from Area Bombing

..due to...

-*High civilian casualties* had always been a feature of area strategic bombing.

-Images of the results of these campaigns disturbed the American public enough to *demand a stop* to the campaign.

-the *ineffectiveness of carpet bombing* (partly because of a lack of identifiable targets),

New Precision Weapons were developed. The new weapons allowed more effective and efficient bombing with reduced civilian casualties.

Strategic bombing was entering a new phase of

-high-intensity and focused attacks **using newer and modern fighter aircraft** enabling less reliance on heavy, more vulnerable bombers.

-use of **smart munitions**. These guided munitions were used more and more instead of conventional, unguided bombs.

In the **Kosovo War**, and the initial phases of **Operation Iraqi Freedom** of 2003, strategic bombing campaigns were notable for the heavy use of precision weaponry by those countries that possessed them.

Although bombing campaigns were **still strategic in their aims**, the **widespread area bombing tactics of World War II had mostly disappeared**. This led to *significantly fewer civilian casualties* associated with previous bombing campaigns, though it has not brought about a complete end to civilian deaths or collateral property damage.

...until....

2022 RUSSIAN INVASION OF UKRAINE

As part of the 2022 Russian invasion of Ukraine, airborne strikes hit Ukraine infrastructure periodically, increasing damages, deaths, injured, and deeply affecting energy distribution across Ukraine and nearby countries.

By late November 2022, nearly half of the country's *energy systems* had been destroyed, leaving millions of Ukrainians without power.

The methodical attacks on power stations and electrical nodes imposed large economic and practical costs on Ukraine, with a severe impact for millions of civilians over the winter.

It was assumed that Russia's strategic intention was to *break the will* of the Ukrainian population to continue the war.

AERIAL WARFARE: INTERNATIONAL LAW SINCE 1945

New Discussions on the limits or Bombing Civilians

The Nuremberg Charter: 1945

After World War II, the massive destruction of non-combatant targets inflicted during the war prompted the victorious Allies to address the issue when developing the *Nuremberg Charter* of August 1945.

The *purpose* of the Nuremberg Charter of 1945 was to *establish the **procedures and laws*** for conducting the **Nuremberg Trials** (1945-1946).

The Nuremberg Charter of 1945 was the first major *attempt to update* The Hague Conventions of 1907, and the ideas of The Hague Rules of Aerial Warfare of 1923.

The Charter thus condemned the "*wanton destruction of cities, towns or villages, or devastation not justified by military necessity*" and classified it as a violation of the *laws or customs of war*, therefore, making it a **war crime**.

This provision was similarly used at the Tokyo Trials of 1946–1948 to try Japanese military and civilian leaders in accordance with the Tokyo Charter (January 1946) for illegal conducts committed during the Pacific War of 1941-1945.

*However, due to the **absence** of positive or specific customary **international humanitarian law** prohibiting illegal conducts of **aerial warfare in World War II**, the indiscriminate bombing of enemy cities was **excluded from the category of war crimes** at the Nuremberg and Tokyo Trials.*

Therefore, *no Axis* officers and leaders were prosecuted for authorizing this practice. Furthermore, the United Nations War Crimes Commission received no notice of records of trial concerning the illegal conduct of air warfare.

1963 Japanese Judicial Review: Addressing Nuclear Bombardment

The atomic bombings of Hiroshima and Nagasaki became the subject of a **1963 Japanese judicial review**. The review clarifies issues, "distinctions" which are *pertinent to both conventional and atomic aerial bombardment*.

Based on international law found in Hague Convention of 1907 and the Hague Draft Rules of Air Warfare of 1922–1923 the *Court drew a distinction between*

*-"**Targeted Aerial Bombardment**" and **indiscriminate** area bombardment (which the court called "**Blind Aerial Bombardment**"), and also a distinction between a **-defended** and an **undefended** city.*

Thus, in the **judgement of the Court**, because of the immense power of the atom bombs, and the distance from enemy land forces, the **atomic bombings** of both Hiroshima and Nagasaki "**was an illegal act of hostilities under international law as it existed at that time, as an indiscriminate bombardment of undefended cities**".

But....Not all governments and scholars of international law agree. For example: Colonel Javier Guisández Gómez, at the International Institute of Humanitarian Law: "In examining these events, in the light of international humanitarian law, it should be borne in mind that during the **Second World War there was no agreement, treaty, convention or any other instrument governing the protection of the civilian population or civilian property.**"
....Therefore, using this logic....Japan was vulnerable to legal area bombardment of cities.

A series of treaties governing the laws of war were adopted starting in **1949**. The **Fourth Geneva Convention** attempted to erect some legal defenses for civilians in time of war. Still, *no explicit attention is paid to the problems of bombardment*.

1977, 4th Geneva Convention, Protocol I was adopted as an amendment to the Geneva Convention.

It prohibited the deliberate or indiscriminate attack of civilians and civilian objects, even if the area contained military objectives, and the attacking force must take precautions and steps to spare the lives of civilians and civilian objects as possible.

This issue was addressed because drafters of Protocol I pointed out historical examples such as *Japan* in World War II who often *dispersed legitimate military and industrial targets throughout urban areas* either with the sole purpose of preventing enemy forces from bombing these targets or using its civilian casualties caused by enemy bombardment as propaganda value against the enemy.

(.....**This made made Japan vulnerable to area bombardment and the U.S. Army Air Forces (USAAF) adopted a policy of area bombing.**)

As of February 2020, it had been **ratified** by 174 states, with the *United States*, Israel, Iran, Pakistan, India, and Turkey being *notable exceptions*.

Reasons: "The United States did not ratify Additional Protocol 1 because of concerns that it would undermine the humanitarian laws of war and endanger civilians by elevating the legal status of terrorist groups to combatants."

2019, President **Vladimir Putin** signed an executive order and submitted a *bill to revoke* Russia's ratification of the Protocol I. The bill was supplied with the following warning:

"Exceptional circumstances affect the interests of the Russian Federation and require urgent action. ... In the current international environment, the risks of abuse of the commission's powers for political purposes by unscrupulous states who act in bad faith have increased significantly."

1996 The International Court of Justice gave an advisory opinion on the Legality of the Threat Or Use Of Nuclear Weapons. The court ruled that:

- "the threat or **use of nuclear weapons would generally be contrary** to the rules of international law applicable in armed conflict."

- "There is in **neither** customary nor **international law** any comprehensive and universal **prohibition of the threat or use of nuclear weapons.**"

-it could **not definitively conclude whether the threat or use of nuclear weapons would be lawful or unlawful** in an extreme circumstance of **self-defense**, in which the very survival of the state would be at stake.

ARE STRATEGIC BOMBERS STILL RELEVANT TODAY? THE NUCLEAR TRIAD

The Pentagon is pursuing *upgrades of the current strategic systems* and is also pursuing *acquisition of new, high-performance strategic weapon systems* designed to keep pace with offensive and defensive developments in rival nations.

Tactical nuclear weapons, also known as *non-strategic nuclear weapons*, are used in air, land and sea warfare. Their primary use in a non-strategic war-fighting role is to destroy military forces in the battle area.

Air-to-air missiles, rockets, surface-to-air missiles, small air-to-ground rockets, bombs, and precision munitions have been developed and deployed with conventional or nuclear warheads.

Naval forces have carried weapons that include nuclear-armed naval rockets, depth charges, torpedoes, and naval gunnery shells.

The renewed focus on great power rivalry and conflict has reinvigorated the significance of the US strategic deterrent and strategic operational capabilities.

This return of great power conflict underscores the need to retain a robust, balanced strategic triad of mutually reinforcing elements.

The **nuclear triad** is a three-pronged military force structure that consists of

- land-based intercontinental ballistic missiles (ICBMs)
- submarine-launched ballistic missiles (SLBMs)
- strategic bombers with nuclear bombs and missiles.

The *triad* gives the ability to deliver a nuclear attack by land, sea or air. The maintenance of a triad rather than a one- or two-element nuclear force provides flexibility, survivability and redundancy to enhance the deterrent function and should deterrence fail ... deployment if deemed necessary.

1)Intercontinental Ballistic Missiles (ICBMs) allow for a long-range strike launched from a controlled environment. These missiles can also be launched, and *reach targets, faster* than the other legs of the triad.

Because firing an ICBM is an unmistakable act, they provide stronger clarity about when a country is under attack and who the attacker is.

2)Submarine-Launched Ballistic Missiles (SLBMs), launched from submarines, allow for a greater chance of survival from a first strike, giving a second-strike capability.

3)Strategic Bombers

Modern Strategic bombers are designed for deep penetration missions into enemy airspace to destroy high-value targets.

While the term “strategic bomber” is often used synonymously with nuclear armed bomber, conventionally armed aircraft are equally capable of striking strategically significant targets deep within enemy territory.

Arguments against maintaining a Bomber force: Bomber Vulnerabilities/Drawbacks:

-It's expensive to maintain all three parts of this strategic triad. *Strategic bombers have frequently been singled out as potentially superfluous.*

-The basic combat power of strategic bombers. In comparison, aren't the stealthy and what is deemed the highly survivable strategic ballistic submarine leg of the triad much better?

- The home and forward operating bases of strategic bombers are known; this makes the planes and their support infrastructure vulnerable to preemptive attack.

- Unlike ICBMs and SLBMs, bombers performing an attack run require additional support forces including aerial refueling.

-While an ICBM needs 30 minutes to destroy a target, bomber aircraft need *many hours* to approach their weapons deployment zone; the enemy has considerable time to detect and monitor the

bomber, and take defensive measures. In this context, bombers are vulnerable to air defense missiles, interceptor aircraft, and electronic warfare.

So, this raises questions about their capability to reach well-defended targets in the current age of high-performance air-defense systems.

Arguments in favor of maintaining a Bomber force: Bomber Advantages:

Advocates of strategic bomber airpower counter these arguments of bomber vulnerability.

-Base Protection: Home bases and forward operating locations can be protected by air and land based missile-defense artillery. Bomber advocates also argue preemptive strikes on bomber bases alone would make little sense as long as the US retains its nuclear missile forces.

-Bombers that contain an **aerial refueling** fleet support makes it **possible for bombers to be alert and on standby**, making these airborne assets nearly impossible to eliminate in a first strike

-If **dispersed in small airfields** (like the SAC base in Marquette) or aboard an aircraft carrier, they can reasonably avoid a counterstrike giving them regional second-strike capacity.

- Unpredictable Mission: Although bombers might be detected by enemy long-range sensors, this does not automatically reveal their target; aircraft can change course multiple times before releasing their payload. This gives them the ability to remain unpredictable and to pursue numerous approaches of attack, unlike ballistic missiles which – to date – must remain on a set trajectory.

- Flexibility, including **payload options**. Payloads can be a mission-specific selection of nuclear or conventional ordnance. Cruise missiles for instance, rather than gravity bombs, would enable them to release their ordnance from the edge of the enemy's effective air defense zone.

-Rapid deployment and recall in response to last-minute decisions. Unlike missiles, bombers can be **recalled** a any time prior to weapons release.

Should the President feel the need to order an air strike (egad, stand back, Martha), there remains several hours for continued analysis or negotiation before the aircraft reach their launch zone.

Since bombers are recallable, they can serve as an encouragement to de-escalation. Bombers can be deployed as highly visible power-projection platforms, flying them near an opponent's airspace, or to dial up pressure to match an opponent's intimidation tactics.

And, since bombers are recallable, sending them away from a potential target is a highly visible way of demonstrating to enemies and allies that a nation wants to resolve a fight, thus preventing war.

All tallied up, the offensive capacity and flexibility of strategic bombers continues to exceed their vulnerabilities....and remain relevant.

Current Bomber Force

B-52: Original Operational Capacity in 1952 with constant upgrades. It continues, in its present form, to be the most versatile bomber, capable of carrying conventional and nuclear weapons.

B-1 Lancer; IOC 1968. Highly maneuverable at low and high altitude. Class-specific world record holder for speed, payload, range, and climb rate. Now carries only conventional weapons

B-2 Spirit: Entered service 1997. Stealth technology not as much of an advantage now that anticipated development of peer-level adversaries' air defense systems diminish the effectiveness of the B-2's "low-observable technology" in coming years.

B-21 Raider: Scheduled to replace the B-1 and B-2 in the 2030s.

USAF's choice to replace the two younger airframes rather than the B-52 reflects the latter's large and versatile payload capability, simpler maintenance, and – not least of all – the ability to deploy new long-range weapons currently being developed.

The B-21 is being designed by Northrop Grumman to operate in a highly contested environment marked by advanced enemy sensors and air defence systems. Its stealth technology will be three decades more advanced than that of the B-2, and is expected to enable deep penetration missions even against peer-level opponents.

The RAIDER will accommodate a broad range of nuclear and conventional stand-off and direct-attack munitions. The operating concept calls for integrating the bomber with various support platforms including Intelligence/Surveillance/Reconnaissance assets.

Unmanned combat aircraft and electronic warfare aircraft, controlled by the B-21 crew, will escort or collaborate with the bomber, according to statements made by Air Force Secretary Frank Kendall in December 2021. The B-21 itself will be configured for optionally manned or unmanned operation, although that capability will not be found on the earliest production aircraft.

In addition to the *optionally manned B-21*, USAF also plans to introduce a cheaper, *fully unmanned bomber* to partner with the RAIDER. The Pentagon plans to request research and development funding for the unmanned aircraft in 2023 and 2024.

CRITICISMS OF THE WISDOM/MORALITY AND EFFECTIVENESS OF USAAF BOMBING

-In the Second World War Americans were relatively quiet about the harm to civilians resulting from US bombing, while Americans spoke out loudly against German and Japanese atrocities.

Evidence *that Americans were likely equally insensitive as the British - although* officially stating *precision bombing* as a part of their strategy.

American military doctrine did not argue that *civilian bombing* might produce a rapid end to the conflict.

-The US developed and used weapons - incendiary bombs - designed to create fire storms and widespread devastations of urban areas, including civilians.

-The bombing programs of General Hap Arnold and Curtis ("Bomb them back to the stone age") Lemay who transferred from Europe's "precision" bombing to Japan area bombing

"The prevailing emotion seems to have been that no target should remain un-spared. The argument was one of potential resistance. It no longer claimed that civilian morale would collapse. It simply postulated that the *more* destruction there was, the *sooner* the collapse would come."

Summary Thoughts About Bombing: Collateral Damage, Retaliation, Morale

Charles S. Maier is Leverett Saltonstall Professor of History at the Harvard University

"Again, Most of the debates regarding aerial bombing involves the issues of bombing before, during, and immediately after WWII, and especially about targeting cities with full knowledge of collateral damage of loss of non-combatant civilian life.

Americans have engaged in national atonement with regard to Native Indigenous People, African-American slavery, and segregation, and the internment of Japanese-Americans during WWII.

...But the "good war" is still too fresh in their memory or too necessary a perception to be subjected to the same emotional scrutiny."

Do the Ends justify Means...a matter of perspective

For many years the *morality debates* on the *atomic bombing* of Hiroshima and Nagasaki overshadowed *debate on the "conventional"* bombings during and even before the Second World War.

The implied consensus was that the **German bombings** Guernica in 1937, of Warsaw and of Rotterdam in the early war, and in 1940 the London Blitz, and the bombing of Coventry, were acts of **wanton terror** designed primarily to terrorize populations, with *little military value*.

In *contrast*, the *subsequent more destructive Allied attacks* waged with hundreds of planes that could carry far heavier bomb loads than on the earlier bombings by Germans, *were viewed as legitimate military actions*.

The emotion was/is that the Americans were fighting for democracy, whereas the Axis powers attempted to brutally impose fascism upon the world. The use of bombs was also a far cry from the hand-to-hand atrocities committed by the Germans and Japanese. Also used as a rationale was that American air raids on civilians did not take place in a neutral context, and civilians in fascist dictatorships were often ruthlessly sacrificed by their own side.

In the early days, bombing plans were *not officially* developed in terms of *morale* and *retaliation*. It was more trying to figure out the scale of civilian casualties permissible to disable Germany's war industry.

As the war went on, the earlier ideas about collateral damage "proved sufficiently elastic - any industrial or transport capacity contributed to the German and Japanese war effort. How much devastation was permissible?"

Once the tide had turned (1944), violence was ingrained and the capacity to inflict damage, but largely indiscriminate damage - had been vastly enhanced."

The Allies transitioned from the purposeful pursuit of targets (railroads, industry) to morale/area bombing after the first couple of years of war.

The Germans were very frank (haha) about this. The "V" in the V-1 and V-2 rockets used later in the war were designed to create terror and havoc. the V stood for *Vergeltung*, meaning reprisal or retaliation.

In debates, Allied bombings (e.g. Italian, German, and then Japanese urban centres (including the massive 1945 assault on Tokyo that may have taken 100,000-125,000 lives) (with Dresden perhaps an exception) were defended as a necessary **means to a worthy end**.

"In targeting Sodom and Gomorrah for incendiary attacks, even God was willing to allow innocent victims."

(Maier) "So, for a long time, most post-war debate about the **means used** was subordinate to the consideration of the **ends to be attained**.

Allied victory was a worthy end that justified the very means condemned when used in the service of an **Axis victory - an unworthy end**. "

-Cold War conflicts, Korea, Vietnam and post-1992 wars, with loss of civilian lives, and devastation to towns, cities and villages, have been used by critics of the USA as evidence of *American imperialism* and of an indifference to cultures and peoples of which they did not well understand.

What air war discussions reveal (Maier)

1)-In the discussion about the legitimacy or “just war” justification of massive aerial bombardment, was not considered part of the discussion.

2)-in large scale wars, reprisal became an accepted course of action.

3)-reprisal must be analyzed statistically

-what remains *unacceptable* is the targeting of individual civilians.

-what *is acceptable* is reprisal with the statistical certainty that a given percentage of civilians must be killed in the process.

4)-Vengeance, including *civilians deaths*- is *allowed* so long as the victims are not personally selected.

(In the final analysis, those of us who accept air war say that under certain conditions it may be necessary to burn babies and kill others for whom no theory of a society at war can plausibly claim to have opted for war.”)

5) Questions:

-Why is it more acceptable that 5% of a city of half a million will be killed (25,000) so long as we do not specify which 5%, whereas shooting 50 hostages out of hand is unacceptable?

-Why is it more acceptable to condone, as a means of warfare, bombing of cities and towns with the statistical certainty of innocent victims, but to condemn the terrorism that purposely kills innocent civilians as a pawn in a political response?

Answers:

-Terrorism is specifically intended to kill innocents

-In city bombing their death is merely accepted

-Evil regimes hold their own citizens hostage and are as responsible for the death of “innocents” as those who seek to defeat them.

Conclusion: (Maier)

“...We might plausibly argue that our statesmen and pilots could have killed fewer non-combatants, and that is probably where most of us are left following all these discussions.

Yet, at the end we are forced to confront inconsistencies and beliefs that we would rather avoid.

***Jus in bello* remains at best an asymptotic guideline, never fully to be achieved, often to be hypocritically violated.**

But what other choice do we have?”

WILL THE NEXT WAR BE A CYBER WAR?

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