

BJØRN BERGE: In the Age of the Bombers

Published by Spartacus Forlag, September 2019
Rights: www.hagenagency.no hagency@online.no

Sample translation

CONTENTS

Foreword	2
The bomber as fallacy. A short introduction	4
THE FIRST WORLD WAR	6
1 Fiasco with cigar	
2 A Russian Doctor Frankenstein	
3 Bombs in the circus ring	7
4 The giants	
INTERWAR PERIOD	12
5 The architects' sons	14
6 The dragon-slayers	
7 Let's kill the moonlight	16
8 Mustard gas and functionalism	
9 Stages in the life cycle of a water chestnut	
10 All aviators are born fascists	
11 Merchants of death	
12 Black pedagogy	
THE SECOND WORLD WAR	
13 Fleas over China	18
14 Trumpets of Jericho	21
15 To Berlin with Mother Goose	
16 St Valentine's day 1942	
17 Total war in Disneyland	
18 Lack of moral fibre	
19 Aircraft construction in the Gulag	24
20 Slaughterhouse 5	
21 The smell of dried octopus in the morning	
TOWARDS A COLD WAR	
22 White man's burden	
23 Antichrist in the jungle	27
24 Shining tornadoes against bullock carts	
25 Mercenary bombing from the night club	
26 The poor man's bomber	
27 Jack D Ripper's death rattle	
INTO THE PRESENT	
28 Only bad weather	
29 Frankenstein in Baghdad	30
30 Swansong over the desert	32

To Shadi Omar Kataf, post mortem

FOREWORD

It was a sunny morning in South Africa almost 20 years ago. I was standing with my two teenage daughters on the shore of False Bay, best known as the breeding ground of the great whales of the Antarctic Ocean. A brisk wind was blowing and we were just preparing to return home when a huge shadow suddenly revealed itself over the mountains to the east and slowly skimmed across the white-crested waves, accompanied by a growing rumble. It was an ancient four-engine bomber; beyond a glint on the cockpit window and a faint blush of sun beneath its leathery belly, it looked coal black to me, standing as I was with my face to the sun. All at once, the noise grew deafening. The air literally shook as the aircraft gunned its engine directly above us, perhaps no more than a hundred metres up, then, in the next instant, sucked me hollow in a great vacuum. That's when I got goose-bumps. Over my entire back. I was in ecstasy.

My daughters clung to me. They were scared witless and I could sense one of them sobbing – but that seemed a long way off. It was of no concern to me. This was one of the most beautiful things I'd ever seen. Only once the aircraft had vanished over the ridge to the west did the trance release me, slowly displaced by something akin to shame, but not because I had let my daughters down. It was something else.

Although the bomber was old, almost an antique – now perhaps serving out its final years in the South African coastguard – it was, nonetheless, developed down to its tiniest detail as a killing machine, designed to unleash the greatest possible destruction in the shortest possible time, anywhere on the planet. Despite being a peaceful soul, my reaction was anything but rational. It was as if my primal nature had taken over.

Many men have an odd relationship to military technology. It's always been this way. When returning soldiers declare that “war is better than sex”¹, they're not just talking about fist fights. They're talking about technological warfare, in which feeble bodies are bolstered by the prosthetics of transcendent weaponry – from the flint axe of the Stone Age, through the war galleys of the Roman Empire and the cavalry bows of the Mongols to submachine guns, battleships and tanks. It is this melding of human and machine that culminated in modern times in the bomber, the most extreme weapon humanity has ever conceived. With its almost unreal capacity to inflict violence through explosive bombs, incendiary bombs, gas bombs and, in its latest manifestation, atomic bombs, it can exercise power back and forth across front lines, often deep into enemy territory, where it can wipe out entire cities – buildings and inhabitants alike – in a matter of minutes.

In this book, the development of the bomber will serve as a sounding board, illuminating a dark side of modern man's psychological history. It deals with the underlying ideas, the inventiveness, speculation, haughtiness, arrogance and – at times – sheer madness. This history is told through individuals among the military strategists, aviators, engineers and arms dealers, and I can promise you a catalogue of testosterone-charged rampages. Fortunately, there is a comic cast to much of this. That's the way we men are when the red mist descends.

Perhaps the reader will also learn more about the reasons why modern nations lose more wars than they win. It would appear that the use of superior technology has no effect – quite the contrary, in fact. In many cases, bombers prove as impractical as the feathered finery of the Pope’s Swiss Guard. But unfortunately the costs remain high: hundreds of ruined cities and countless bomb victims. And we will meet them, too.

The book is divided into five eras, from the First World War up until today. In all, it introduces thirty aeroplanes, which can be deemed representative of the bomber’s technical development. With a couple of exceptions, this account is restricted to the large bombers that were constructed primarily for mass bombing of cities and civil society.

I would like to thank all those who have contributed to my work on this book. In addition to all the world’s librarians, special mention must go to Trond Berge, Tormod Heier, Anette Rosenberg, Svanhild Naterstad, Johannes Inge Halseth, Annalise Berge, Eirik Brazier, Marco Pannaggi, Anna Fara Berge, Sofia Lersol Lund, Marie Rosenberg, Dag Roalkvam, Gerd Johnsen, Eirin Hagen, Nichlas Cobb and Nanna Baldersheim. Together they represent not just broad life experience but also crucial expertise in the fields of military history, world history and technology.

I also wish to thank the men – my brothers and fellow conspirators – who spend their lives travelling around the historical battlefields of the world, intoxicating themselves with war books and tough-guy movies. The most notorious ones spend their leisure time dressing up in military gear and re-enacting baroque war rituals. When they take their places in their dilapidated veteran cars, they don’t just absorb the oil fumes and the racket, but also imagine a trace of the blood stench and heroism, and their voices fall a few octaves towards the bass. And if, like me, they should be lucky enough to experience a flyover by a fifty-year-old bomber, they would be pretty certain to confirm my ecstasy.

Nonetheless, the time has come – at least for those of us who are now on our way into old age – to recall the somewhat surprising observation of the American author, Robert Warshow²:

Watch a child with his toy guns and you will see: what most interests him is not (as we much fear) the fantasy of hurting others, but to work out how a man might look when he shoots or is shot.

Time’s up. Let us practise dying with style!

The bomber as fallacy. A brief introduction.

The gaze from above has always been associated with a superior overview and control: human beings seem almost like figures on a game board, incapable of hiding or fighting back. This is why the world is ruled from above in religion. In the Koran, it is from the air that the Zabaniyya – also known as the nineteen angels of hell – launch the constant punishments they enact on God's behalf. In the Bible, Revelations 6, we read about angels who hurl down hail and fire, causing a third of the earth and trees to burn and a third of the sea to turn into blood. The Hindu poem the Mahabharata tells of small devils who carpet-bomb the city of Dwarakha from their winged chariots, wiping out everything in their path.

The first true air raid happened during the first Italian War of Independence in 1849, when the Austrians dispatched a swarm of two hundred unmanned hot air balloons across the lake to Venice. They were carrying small bombs – each weighing fifteen kilos – which would explode on impact. The flying time was calculated at half an hour – by which time the fuel was exhausted – but unfavourable weather conditions caused most of the bombs to land in the sea. Since then bombing from the air has become an increasingly important part of warfare, and is now the dominant form. A powerful bomber fleet has become an obligatory component in the military apparatus of all great powers.

The introduction of new technology is rarely an unmitigated success. There will almost always be side effects, which may, in some cases, outweigh the intended effects of the technology itself. There may be unexpected consequences: plastic in the natural environment, mobile phones that can also be used as surveillance devices or an internet that reconfigures global economic power structures. Bomber technology soon proved too imprecise to distinguish between military and civilian targets. It thereby broke radically with the ethics that had applied in Europe since the Middle Ages: that wars should be fought between soldiers.³

But it is in the nature of technology that, once introduced, it is difficult to roll back. Thus aircraft technology laid the foundations for a new way of thinking about war, in which civil society would no longer be spared.

During the trench warfare of the First World War, thousands of soldiers had suffered shell shock – a condition that involves paralysing fear, chronic insomnia, distortion of reality and aggression. In the absence of other experience, both psychologists and military strategists assumed that massive bombardment of the enemy's civilian population would have the same effect, rapidly transforming them into a herd of traumatised zombies restlessly fleeing from city to city.⁴ They pictured a chaos in which their opponent lost all fighting spirit, suffered internal collapse and ultimately surrendered. Thus, they claimed, the wars of the future could be concluded much more quickly, with less bloodshed and without any unnecessary use of resources.

The ideas soon gained acceptance and were practised through most of the wars fought in the 20th century. The fundamental principle has been massive and sudden attack, often pre-emptive strikes. Differences of opinion among the strategists have been restricted to the question of whether it is most effective to kill as many people as possible outright or to subject them to more prolonged

suffering by bombing farmland, water supplies, energy production and other vital infrastructure.

Over close to a hundred years, aerial bombardment has emerged as the most rational and modern means of waging war. There is something pre-eminently predictable and almost reassuring about an orderly bomber squadron being dispatched to wield its tremendous might. Behind it stand politicians, military strategists and the arms trade, with its shareholders, directors, lobbyists, engineers and factory workers. From this perspective, it seems almost frivolous to ask the most illuminating question of all: Does it work? Is this a form of warfare that lives up to expectations, leading to rapid, effective victories?

Surprisingly enough, the answer is no! Bombers have never won wars and have only exceptionally influenced their outcome. The mass bombings of Japan, England and Germany during the world wars, as well as those in Korea, Vietnam and Chechnya in the latter half of the 20th century, failed to cause widespread demoralisation among the civilian population.⁵ Far more often, the result was the exact opposite. The Germans' bombing of London helped strengthen morale and solidarity instead. The same was true in the bombed-out German and Japanese cities. And the extensive bombing campaigns against African and Asian countries with links to terrorism in recent years have tended to increase the number of terrorists and terrorist sympathisers rather than reduce it.⁶

As far back as the interwar years, psychologists grasped an essential difference between trenches and bombed cities. The fear of death or injury seldom causes trauma in itself. Much of the shell shock in the trenches was caused by the threat of a subsequent direct confrontation – one-on-one contact – with enemy troops and fellow men who did not wish you well. The shells contributed at most to amplifying the traumatisation through a kind of “tenderising” process.⁷

When we realise that bombing as a military strategy has never worked but has merely ensured tremendous misfortune and pain, an unavoidable question presents itself: Why do we keep doing it?

Air force strategists have always been renowned for their limited interest in history and almost physical aversion to any kind of intellectualising.⁸ Rather than engaging in self-reflection, they have always claimed that there are technological solutions to every problem: everything will sort itself out as long as the aircraft are faster and the bombs more powerful and the targeting systems more precise. This attitude has, naturally, been supported by the aviation sector, which has grown to be the world's mightiest arms industry over the past hundred years. At the same time, its growth has provided ever more jobs and ever-higher tax receipts, which has also helped soften up politicians. And time and time again, they have yielded to the spellbinding prospect of easily won warfare without any “boots on the ground”. We appear to have ended up with an almost sealed ecosystem whose sole function is self-perpetuation. At first glance, that is.

But the fact is that, for more than a hundred years, bombers have also played a fundamental representational role, not unlike the Gothic cathedrals of the Middle Ages.⁹ By virtue of their size and roaring engines, they have served as an indication – albeit a symbolic one – of the originating nation's potency and

might. Because they have also contained cutting-edge technology, engineering and design, they have simultaneously sent a clear message about intellectual and cultural supremacy. [...]

THE FIRST WORLD WAR

The term *Fin de siècle* describes the mood of decadence and world-weariness that prevails on the eve of the First World War in 1914. The art and literature of the time cultivates the impression that civilisation is in decline. And yet it is a time of peace. Women in billowing dresses and broad-brimmed hats stroll the European boulevards arm-in-arm with men in tweeds and bowler hats. Modern factories, increasingly less akin to Greek temples, are shooting up everywhere, and private motor traffic is growing ever denser. The unrest that simultaneously smoulders among the underpaid, growing working class has yet to manifest itself significantly.

Although the golden age of exploration is over, a last blast in the colonisation of the outside world is underway – in Africa, Asia, Oceania and South America – because there is still much that has not been divided up. At the same time, competition emerges over the estate of the Ottoman Empire, which is in the process of dissolution in the Middle East and the Balkans. Although this is conducted amicably for the most part, there is, at the same time, some alliance-building, and the federation between Germany and Austria-Hungary soon emerges as the leading power on the European continent.

Industrialisation, with its continuous development of new materials, has also stimulated the urge to conquer the air. Experiments with airships had already begun as early as the late 1800s and in July 1900, the first workable variant – Luftschiff Zeppelin LZ1 – made its maiden voyage. Three-and-a-half years later, in December 1903, the first motorised aeroplane took off on a short, but absolutely genuine, plane journey of a hundred metres. Despite their meagre insight into aerodynamics, American brothers Orville and Wilbur Wright managed to construct a wing profile with the necessary lift.

In the years that followed, flying was primarily seen as a game for bold engineers and adventurers.¹⁰ At the same time, it was good entertainment. The public flocked to air shows and the press announced prizes for those who flew furthest and quickest, as if it were a matter of a race to the Poles or swimming the English Channel.

Almost ten years into the century, the military continued to take a wait-and-see approach to flying as such. The war industry, which became a separate industrial sector in the latter half of the 1800s, had focused on the development of rifles, cannons and warships.

But a change of mood becomes discernible after the Frenchman Louis Blériot flew a fragile little single-engine aircraft across the English Channel in summer 1909. All at once, the British sensed that the safe barrier between them and the Continent had been removed. “Men who navigate the air know nothing of frontiers and can laugh at the blue streak,” as the press baron Lord Northcliffe declared.¹¹

[...]

3. Bombs in the circus ring

We can assume that there's a whiff of circuses – that powerful sweetish scent with hints of clown make-up and fresh elephant dung. But we don't know whether it happened in the middle of the lion tamer's number or when the riotous monkeys or the scantily clad tightrope walkers were performing. What we can state with certainty is that nine-year-old Albert Kohler was sitting in the big top with his brothers when the bombs went off.

It was a sunny day, 22 June in the war year 1916. The terrible battle of Verdun had been raging for four months and the French were under pressure after massive German gas attacks. But in Karlsruhe, on the edge of the Black Forest, with its 110,000 inhabitants, there were few reminders of war. The town lay a good distance from the front in the Catholic part of Germany and was celebrating Corpus Christi with a holiday. The grass in the parks was already green after a late spring and Albert Kohler was on a trip into town with his family. They had spent the morning looking for something resembling holiday food. "We trawled all the horse butchers. But in vain. Everywhere we heard: There is no horsemeat. The circus took it for the lions."¹²

The five bombs that fall directly outside the big top of Hagenbeck Circus in the middle of the matinee were dropped by the French air force's elite squadron, L'Escadrille 66. The audience of more than two thousand people panics, storming for the exit. Some trip over and are left lying there. Those who get out are greeted by new bombs, which now explode in their midst in an infernal sea of flames, and howls and shrieks from people and animals.¹³

At first, little Albert Kohler is more astonished than afraid. "A man dressed in an East African colony uniform still sat astride camel. I saw the camel suddenly sink to its knees and the man now hanging down to the side."¹⁴

Eight-year-old Gertrud Ochs is clinging to her mother, who suddenly collapses and falls to the ground. "A bomb splinter had struck her straight in the heart... Blood poured out of her back."¹⁵

15-year-old Gustav Ott has just managed to get out of the big top in one piece. One hand holds his folded circus programme; the other, the hand of his six-year-old brother whom he absolutely mustn't lose. "We stormed to Hotel Germania. The ground was covered in handbags, watches and other mislaid items. My brother pulled me back. He was determined to carry on watching the circus and was unaware of either the situation or the danger we were in."¹⁶

Behind them lie 117 dead, most of them children. 152 are wounded. 11-year-old Hermann Mayer is left behind in the chaos. "The fire brigade hosed down the pavement and the streetlamp from which human body parts were also hanging. The street was a sea of blood."¹⁷

The attack on Karlsruhe is later judged to be history's first deliberate bomb attack on civilians.

The French bomber was a Caudron G.4 biplane stationed on the pancake-flat Malzéville plateau just northeast of Nancy. The provisional airfield was near the front line but was still a full 175 kilometres away from Karlsruhe – the maximum range for this kind of aircraft – and the crew had been worried they might not

make it back home. During morning Mass at the little church in the neighbouring village, they'd prayed they wouldn't end up eating "the black bread of prisoners".¹⁸ Afterwards, their champagne toasts had an added vigour.

Throughout Europe, aviators were being recruited among cavalry volunteers. The bond between flier and flying machines was seen as akin to the relationship between rider and horse. All were young and virile – in their mid-20s at most – and they barely got a few hours training before being sent up alone for the first time. Here they rapidly learnt to relish their existence between heaven and Earth, and soon maintained an almost disdainful distance to events on the ground. Above all, they saw flying as a sport, and themselves as a fraternity of knights. They also came to be viewed in this way. The aviators were the nation's bold duellists, with all the attendant prestige. Nobody had more pull with the ladies. Nor was anybody better looked after. While the soldiers in the trenches eked out their fragile existence on watery stew in damp foxholes, the aviators returned home each time to glory, brandy, ice cream and soft beds. And if they met their end along the way, they did so with silk scarves and shaven chins, should that serve as consolation.

Before take-off the squadron leader Henri de Kerillis wished everybody luck, as usual. He was a respected leader with a reputation for maintaining tight discipline, who had himself grown up in the military aristocracy. That said, his father – the rear admiral – had garnered little military glory and was best known for a dubious report about a UFO observed from his warship off Cherbourg, Normandy, on several consecutive nights in April 1905.

The sun glittered on the rivets around the engine cowling. The afternoon was cloudless and clear. De Kerillis squinted at the sky, assessing wind and flying conditions one last time. His heavy jaw, thick eyebrows and protruding ears gave him something of a resemblance to a chimpanzee. And his quick, slightly restless gaze spoke of a man who could barely sit still for very long.

The nine aeroplanes take off with extra fuel and the bombs suspended beneath their bellies. In each of them sit a pilot and a navigator, who will also man the machine gun and release the bombs. Against a greyish-brown background, the wings and tails are decorated with stripes of red, white and blue – the French tricolour – while the front end of the fuselage bears a stylised falcon, wings outstretched and a sun behind its head. It represents the Ancient Egyptian god of war, Horus, and is the squadron's emblem.

The aircraft rapidly settle into a *vol de canard* or V formation, making the row of newly polished machine guns look like a serious threat to any fighter aircraft that might try to take them on. But it is unlikely they will meet any resistance at all. The timing is perfect, since they are flying east. With the sun at their back, they are almost impossible to see. It may be trickier on the return journey.

The bombs are a new type that is being tested out in action for the first time. Named after their inventor, Gros Andreau, they are shaped like a classic espresso jug with fins, and consist of a container with two compartments, one of which is filled with nitrogen dioxide and the other with petrol. Only when the disc that separates them breaks on impact do the substances mingle to form a powerful explosive. The Gros Andreau bombs therefore represent a quantum leap from the earliest bombs, which were either simple hand grenades or something akin to bottles filled with petrol or paraffin.

The first Gros Andreau bombs were dropped from a height of 300 metres at 15:10. After turning sharply, they dropped a new round – 29 bombs in all.

The Caudron G.4 aircraft was developed by brothers René and Gaston Caudron, who had already set up their own aircraft factory outside Paris in 1908. The prototype was in the air by 1915, the year after Sikorsky's Ilya Muromets took its epoch-making maiden flight. But the aeroplane was much smaller, with a wingspan of just 17.2 metres. It most definitely could not be called a heavy bomber.

Like the Muromets, though, the Caudron G.4 was a biplane, with two sets of wings stiffened using cross-braced piano wire made of carbon steel. This was the prevailing principle to afford the wing sufficient strength. At the same time, the construction was as elastic as the traditional wooden fishing boats of northern Norway and could be manoeuvred through wing-warping using a system of strings and pulleys. In the absence of either power steering or other hydraulics systems, even short flights involved tough physical labour.

News of the bombing of Karlsruhe spread fast. It even made the headlines in Australia. People had difficulty grasping that the French pilots had actually targeted the children at the Hagenbeck Circus. It was assumed that they had flown off course or navigated using out-of-date maps.

The fact was that the entire business was a deliberate reprisal for German aircrafts' repeated bombing of French towns close to the front line. Although the targets had been military, several civilian lives were also lost. The revenge attack was commanded directly from French Army HQ, under the command of General Ferdinand Fochs. In his view, they were now even.¹⁹

Perhaps it was only possible to make sense of this if one were from France, with its particular justice system in which crimes of passion were subject to mitigating circumstances. At any rate, it posed no problems for squadron leader Henri de Kerillis:

“What sensations, my dear fellow. It was Corpus Christi Day. [...] my forty bombers claimed 257 victims, of whom 117 were killed. There were a lot of women, a lot of children... Mothers, wives. When I realised that, I felt a savage joy [...]I thought of all those children back home who've fallen since the war, of all our desolate villages, our ruins, our immense sufferings. I have never experienced such intense moments. Throughout our return [...] my heart felt quite swollen with an inexpressible joy.”²⁰

One couldn't put it more brutally.

For their part, the Germans were shocked. Although they had themselves caused increasing numbers of civilian losses in slapdash bombing raids on military targets in European cities using zeppelins and small aeroplanes, they had certainly not expected deliberate attacks on civilians. To avoid a repetition, all bombing of French towns was suspended for six months and leaflets were dropped over Paris:

Germany makes war against armed Frenchmen; she does not war against the civil population, against women and children. She hopes these explanations will suffice to prevent further barbarous air attacks by French aviators, but in case such attacks are repeated Germany will find herself obliged to defend herself by adopting similar measures.²¹

Nevertheless, a line had been crossed. Just weeks later, Kaiser Wilhelm II gives the fiery frigate captain Peter Strasser the go-ahead to conduct unrestricted bombing raids on civilian targets in British towns.

Thirteen-year-old Otto Abetz was injured in the bomb attack on Karlsruhe, though not seriously enough to prevent him in the years that followed from pursuing a career that started with art teaching and led via the Hitler Youth to diplomacy in the Nazi regime's embassy in Paris in 1940. Even so, he is constantly haunted by the childhood experience that "left a profound mark on my memory and determined my subsequent aversion for warmongering and the resultant savageries."²² Nonetheless, in Paris, he was seen as authoritarian and unscrupulous – in many respects the mirror image of de Kerillis – and he had plentiful opportunities to savour the sweet taste of revenge. Abetz was imprisoned by the British in Schwarzwald in October 1945, and served 20 years for war crimes. In 1958, four years after his release, he died in a car accident on the motorway between Cologne and Ruhr.

Until summer 1916, all bombing took place in daylight. But as fighter aircraft became faster and better equipped, both sides switched to night bombing, although only on clear nights. This had not yet become established practice in France before the Karlsruhe raid, and the Caudron aeroplanes were slow and poorly armed. On the way home, L'Escadrille 66 lost three aircraft. One went down in flames, while two others made emergency landings and the crew were taken prisoner. The rest of the squadron took a well-earned break.

Safe at home with his family, de Kerillis wrote tenderly in his journal about his enchanting daughter who "looks like me and murmurs, 'Papa'".²³ He decided to extend his leave until his heavily pregnant wife gave birth to what he hoped would be a son. And it was: Alain – healthy and perfectly formed.

After replenishing his squadron with new aeroplanes and crewmembers, de Kerilliss continued his bombing raids on rail hubs, military depots and airfields, though never again on defined civilian targets. That said, he was no stranger to the thought: as late as April 1917 he suggested a 50-bomber raid on Munich that "would have flung enough German entrails on the pavement of city to give the torpedoes of the Lusitania and the arsonists of Reims pause for reflection."²⁴ But his suggestion was rejected by the French high command, who feared it would degenerate into a cycle of bloody retaliations.

After the war, de Kerillis was employed at the Farman aircraft factory and later established himself as a right-wing journalist and politician with strong nationalistic sympathies. In 1936 he was elected to Parliament. He despised anything that smacked of pacifism and launched himself as the man who would combat communism. He had supported Mussolini's invasion of Ethiopia in 1935 and now he agitated for France to support the fascists in the Spanish Civil War.

Even so, he never pandered to Hitler and Nazi Germany – though more on personal than ideological grounds.

After the outbreak of the Second World War, de Kerillis fled via Jersey to London, only to suffer a nervous breakdown after learning that his son Alain had been executed by a militia in Brittany that was sympathetic to Germany. He then entered a phase of chronic belligerence and, after a loud argument with General Charles de Gaulle in the French National Committee, he abruptly emigrated to the US. He died in exile on Long Island, New York, in 1958, without having taken more than one brief, anonymous trip back to France. An air of bitterness hangs over the entire affair.

INTERWAR PERIOD

When the war ended in 1918, the people were weary of war. Many were hit by the Spanish flu, which had broken out among American soldiers the same summer. Soon it takes more lives than the 17 million who died during the war itself. Little by little, though, civil society finds its way back to normality, relishing the first stirrings of the lively foxtrot on dance floors, and frequent film premieres starring Edgar Rice Burroughs' muscular and infinitely empathic Tarzan character. And they now have the leisure to make use of the war's more peaceable technological innovations, such as canned goods, razor blades and sanitary pads.

All in all, it is a time of technological optimism, and that applies to aviation too. Over the course of the war, the conflicting parties had built a total of 220,000 aircraft. Insight into factors related to airflow – aerodynamics – was still sparse.²⁵ The manufacturers knew little about how the wings and body of the aeroplane should be shaped to optimise lift and reduce the effects of turbulence and air resistance; streamlining was still an unknown concept. But through trial and error and by taking one another's aircraft apart whenever they were shot down, the manufacturers had reached ever-more functional solutions. And while the main materials were still wood and linen canvas, fire-resistant alloys ensured notable improvements in the aeroplanes' engines.

When the increasingly influential architect Le Corbusier enthusiastically proclaims that "The war was a tremendous lever for aviation"²⁶, he is thinking first and foremost of the bombers. They had flown ever higher and faster, close to 200km per hour, largely unthreatened by interceptors, anti-aircraft guns and barrage balloons. The aircraft had also become more stable and easier to manoeuvre, and could carry up to several tonnes of bombs over distances greater than a thousand kilometres.

Even so, the British air force cuts staff numbers from 300,000 to 40,000. Other countries follow suit. After the peace settlement politicians and regular people hope that humanity will be wiser and that war will never again break out among the great powers. This mood makes it unthinkable to earmark money for the maintenance of a huge fleet of surplus aeroplanes, still less for the development of new types of aircraft. So what should all this new knowledge be used for?

The situation is especially frustrating for the many air force generals who continue to insist that the bomber is the weapon of the future, despite the limited success of the wartime bombing raids. But the aviation industry is the hardest hit. Over the course of the war, it has grown from virtual non-existence to a powerful sector split between a handful of dominant firms, each with thousands of employees. Now several of them risk bankruptcy.

That is when new opportunities arise in the colonies. Although the world war also involved many of them, Europe's great powers have, for the most part, been directing their attention elsewhere. With the exception of Russia, all of them have colonies and after the war, the victors' territory is supplemented with the remains of the Ottoman Empire as well as former German colonies in Africa and Asia.

The relative calm of the wartime period has also given many of the colonial populations a taste for freedom. Stimulated by returning soldiers who witnessed the great powers' moments of impotence on the European battlefields, they now eye the possibility of eventual liberation. However, this prospect is quite unacceptable to colonial powers such as Great Britain, France, Italy, Portugal and Spain, which are not under any circumstances prepared to renounce the almost limitless access to resources offered by the colonies. Soon, the bomber presents itself as the most suitable tool for dealing with the situation. A huge capacity for destruction, a long reach and good oversight from the air are useful qualities when you're planning to chastise rebels on the ground.

5. The architects' sons.

In the air are no streets, no channels, and no point where one can say of an antagonist, 'If he wants to reach my capital he must come by here'. In the air all directions lead everywhere.²⁷

This is how H.G. Wells describes the nature of bomb warfare towards the end of his book *The War in the Air*. Right up to the present day, this issue has represented an almost Gordian challenge for international treaties and regulations. Yet an attempt was made as early as 1899, at the First International Peace Conference at the Hague. Article 25 states:

The attack or bombardment of towns, villages, habitations or buildings which are not defended, is prohibited.

Ever since the Middle Ages, Christian Europe had drawn a clear distinction between *bellum hostile*, which denoted an almost chivalrous war between military forces, and *bellum romanum*, an unregulated war that also encompassed the civilian population, including its elders, women and children.²⁸ The *romanum* variant originated with the Roman empire-builders who had in their time proceeded brutally, plundering and slaughtering entire populations without distinguishing between combatants and non-combatants. Far into the latter half of the 1800s, the world's great powers had behaved in the same way. American ships bombarded San Juan del Norte in Nicaragua without mercy in 1854, while British marines almost reduced Alexandria to rubble in 1882.

The Hague Peace Conference attempted to establish international regulations for warfare and most countries of any significance signed up to the Hague Convention of 1899. In addition to the convention, a general prohibition was agreed on "the discharge of any kind of projectile or explosive from balloons or by similar means."²⁹ But at this point, there was much speculation surrounding the continued development of aviation, and it was agreed that the regulation should be reviewed over the next five years. However, at the second peace conference at the Hague in 1907, it was left standing. At the same time, the wording of Article 25 was made more precise:

The attack or bombardment, *by whatever means*, of towns, villages, dwellings, or buildings which are undefended is prohibited.³⁰

More than a hundred nations signed and we must assume that the world – at least for those present at the meeting – at once felt a little more peaceful. Nonetheless, the treaty was unclear. When should a town be seen as "undefended"? Wasn't it legitimate to defend oneself if one was being attacked? And how far away must the nearest military unit or base be? Questions were also raised about whether the paragraph should cover arms factories, the people working there and their families as well. We end up in a classic discussion of responsibility and guilt. Can it be traced back through all the links in the chain to the mines where the ore for the steel of the weapons is extracted?

It hardly simplified matters when the French diplomat, Baron Paul Henri d'Estournelles de Constant – who won the Nobel Peace Prize in 1909 – claimed

that the aeroplane would bring peace to the world regardless. Nobody would go to war any longer once they knew that the enemy's aircraft could strike back harshly against their own civilian population. This point of view was clearly overoptimistic, but at the same time, it anticipated the strategy of the balance of terror that would later guide global policy throughout the Cold War.

No further peace conferences were held before the outbreak of the world war in 1914. A meeting of the Institute of International Law was held in Madrid in 1911 but failed to clarify anything at all.

Amid this confusion there were many people with points of view. Like an echo of the German airship commander Peter Strasser, the British mathematician Frederick W. Lanchester waded in with his 1916 book *Aircraft and Warfare*.³¹ He started out as a dedicated engineer and technocrat. Were it not for his frail physique – he was in generally poor health, had cataracts and was unfit for any kind of military service – he could have been a protagonist in an Ayn Rand novel about alpha males who live only to throw up skyscrapers and hunt down women.³² When it came to theoretical warfare, he was brutal beyond all bounds of decency. He anticipated the Germans' *Feuerplan* and thought the only realistic route to victory was to wipe out the enemy's towns in unquenchable fires.

It is futile to attempt to disguise the self-evident fact that a serious attack on the capital city of an enemy, containing in its heart the administrative centre both of his Army and Navy, in addition to the headquarters of his Government, cannot be regarded other than as a legitimate act of warfare. No international agreement or convention can make it otherwise.³³

He stated it as pure fact and brushed aside any criticism:

There will always be the sentimentalist who has implicit faith (in spite of experience) in the omnipotence of peace conferences and the like and the unalienable rights of humanity (...) To these the destruction of a city of 5,000,000 peaceable inhabitants by fire with the scenes of horror that would inevitably ensue, will be looked upon as the figment of a diseased imagination, to these the author does not address himself.³⁴

These were not intended as political statements on Lanchester's part. It was pure science. In his book, he follows up with a series of differential equations – later known as Lanchester's Power Laws – which present models for the ultimate bomb warfare.

[...]

7. Let's kill the moonlight

When 26-year-old Franz Kafka went to an air show outside the city of Brescia just east of Milan in 1909, he was most interested in the public – a surprisingly diverse collection of women and men who had all turned out in their Sunday best. He wasn't impressed by the flights themselves, which struck him as stupid. "Up there, twenty meters above the earth, is a man trapped in a wooden frame, defending himself against a freely undertaken, invisible peril".³⁵

But other poets were also present who had a greater appreciation for flying. Before Kafka set off to find a hackney cab – well before the show was over – he noticed Italy's much-feted celebrity poet Gabriele d'Annunzio, small and slight in his lime-green suit and pink cravat. There was something manic about the way he scurried about gesturing at the members of the organising committee

Gabriele d'Annunzio regarded aeroplanes as "a sacred thing" and flying itself as an almost erotic experience where the return to earth could best be described as a sensual pleasure interrupted, "*una voluttà troncata*".³⁶ He was always angling for a new trip up into the clouds and we may assume that this was what he was bothering the organising committee with.

Nineteen years later, d'Annunzio found himself in an aeroplane above Vienna. It was August 1918 and the world war was coming to an end. D'Annunzio was now 55 years old and Italy's most celebrated bard, known only as The Poet – *Il Vate* – with his own residence by the Canal Grande in Venice. He had grown stout and gained a bald patch, but he was still energetic and, above all, just as obsessed with flying. Although he never learnt to fly, he had managed to talk his way into a post in the Italian air force, where he was largely viewed as a spectacular mascot. Beyond sporadic participation in bombing missions of limited military value, his most important contribution to date had been the crewmembers' battle cry: "*Eia! Eia! Alalà*" with its solemn origins in Greek mythology.³⁷ And he had taken on responsibility for decorating the aeroplanes, insisting that only trained painters could be used.³⁸

The sortie against Vienna had also been d'Annunzio's own idea, and on this occasion too he had nagged until he got his way. But he didn't get to take any bombs along. This would be a purely propaganda mission involving leaflets, admittedly more than half a million of them. And the text was his own:

We are flying over Vienna, we could drop bombs in tons [...] on the wind of victory that rises from the rivers of liberty, we only came for the sheer joy of the challenge, we only came to demonstrate what we can dare and do when we wish, in the hour we choose.^{39/40}

In his poetry, d'Annunzio had introduced the Italians to the German philosopher Friedrich Nietzsche. D'Annunzio was just as certain that God was dead and saw the aviator as the personification of the superman Nietzsche spoke about. The aeroplane's shadow mirrored that of the cross, a symbol of sacrifice and salvation.⁴¹ And those who dared face the gruesome risks of flight and laugh at death would be promoted to the ranks of humanity's heroes. The earthbound would simply have to resign themselves to their aversion for these "heavenly

helmsmen”, who only occasionally glanced down upon them with disdainful smiles.⁴²

D’Annunzio is like an unstoppable firework show of purple prose. It can get a bit much in the end. It’s difficult to avoid this kind of thing in the Italian poetry of the time, though. Take Filippo Tomasso Marinetti, 13 years D’Annunzio’s junior, who is no less rapturous. He describes his first flight as follows:

I felt my chest open up like a great hole through which, smooth, fresh, and torrential, all the blue of the sky plunged exquisitely. Instead of the slow water-down sensuality of walks under the sun and amidst flowers, one ought to prefer the ferocious and blood-tingling massage of the raging wind.⁴³

One need hardly add that Marinetti soon imitated d’Annunzio, growing a moustache with exactly the same thin, aerodynamic points. He was the spokesman for the futurists, a group of artists who rejected the servile 1800s out of hand. They envisaged a fundamental rupture with the past. They wanted to “kill the moonlight” and pictured the future as a pure, machine-driven civilisation.

We declare that the splendour of the world has been enriched by a new beauty: the beauty of speed... We will sing of the great crowds agitated by work, pleasure and revolt... adventurous steamers sniffing the horizon; great-breasted locomotives, puffing on the rails like enormous steel horses with long tubes for bridle, and the gliding flight of aeroplanes whose propeller sounds like the flapping of a flag and the applause of enthusiastic crowds.⁴⁴

Marinetti proclaimed that futurism would be brought about through war: “We want to glorify war — the only cure for the world... for art can only be violence, cruelty, injustice.”⁴⁵

When Italy entered the First World War on the Allies’ side in 1915, the futurists were on hand as reporters. In Marinetti’s poem, Zang Tumb Tumb, inspired by the fighting in Turkey, the soundscape was utterly essential: “100 metre machine guns rifle shots pop eruptions violins brass pim pum pac pac tim tum machine guns tataratatarata”.⁴⁶ And in his journal, he describes a bombing raid as follows: “long loooooongdroooooO00000ONE of aeroplanes tatatata TUM TUM KABOOOOO00M BOMBS!”⁴⁷

[...]

13. Fleas over China

You can't build a flawless and effective biological bomb with a simple wave of the hand. The elegant and normally jovial Shiro Ishii, head of the Japanese special Unit 731 had got himself so agitated that his round glasses had steamed up. He had just discovered the outcome of the attack on the old Chinese port of Ningbo on 27 October 1940. The attempt to start a widespread epidemic of bubonic plague on the shores of the East China Sea had failed and he had no idea why.

Over the summer the group of engineers and specialist physicians had injected thousands of fleas with blood from plague-infected rats. The work had been painstaking, exhausting and, above all, deadly boring. They could, of course, have scattered the plague infection directly over the city, but the bacteria would live longer in fleas, thereby ensuring more efficient dissemination. To prevent the fleas from getting caught up by the wind, they were bundled up in a mixture of wheat grain and cotton – the latter to soften the impact on landing.⁴⁸

It was more than three years since Japan had invaded China, starting the second Sino-Japanese War. The inhabitants of Ningbo were well on their way to becoming accustomed to the constant bombings. The aeroplanes would enter the Hangzhou Bay from the north just after sunrise, drop their load in the harbour area and continue over the mountains. This time, everything was different. The attack didn't happen until the late afternoon and involved only one aeroplane, which circled low over the city centre. Trailing behind its pale-green body was something that looked like smoke. "I thought it must be on fire, but then the cloud dispersed downward quickly, like rain from a thunderhead on a summer day, and the plane flew away," said Archie R. Crouch, who was in the city working for the American Presbyterian Mission.⁴⁹

The city's inhabitants regarded the golden scattering of wheat grain with astonishment. Some began to sweep it up to give it to their chickens at home and people competed to gather the largest amount. Nobody had the faintest idea what it was all about until the cases of bubonic plague broke out two days later. When the first patient died after four days, the city council took matters in hand. The schools were closed and everybody who displayed symptoms was sent away to a hospital outside the city. At the same time, bricklayers were set to work building a four-metre high wall in the alleys around the six districts in the city centre that were most severely affected. The inhabitants were evacuated through a cage where they were stripped and showered with liquid disinfectant. All their clothing and furniture were destroyed.

When the epidemic persisted until the last week of November, the council decided to burn down the walled-in buildings. "Trails of sulphur were laid out like a rat maze through the condemned area. Ignited at strategic places, fires from the burning sulphur raced through the maze like sparkling snakes [...] The heart of the city was quickly reduced to a pile of glowing embers, and the assumption was that no rat and no flea could possibly escape."⁵⁰

By the time the epidemic finally abated some days into December, 106 people had died. Yet this wasn't good enough, and Shiro Ishii faced a scolding from his superior, General Kajitsuka Ryuji – chief of the medical department in the Kwangtung Army – who declared the attack to have been a total fiasco. Even so, Unit 731 had gained some experiences that merited further work. Among

others, the bubonic plague bacterium had simply proven too infectious. This had alerted the city council quickly enough that they were able to set up effective countermeasures.

As a result, the engineers went on to use other, less acute infectious agents, such as cholera. Over the years that followed, numerous other test attacks were executed, mainly on towns in the mountainous inland province of Hunan, south of Chongqing – and the results constantly improved. In order to achieve greater precision in the attacks, the engineers also set to work on development of a solid container, ending up with the Uji bomb. It was 75cm long, 15cm in diameter and made of porous, unglazed porcelain. This would transport the infectious agents safely to the ground, breaking without the use of any explosive or heat that might otherwise have killed the bacteria. The Uji bomb was fully developed by the end of 1944. In the last few months of the war, it was used to great effect on both civilian and military targets.

The aircraft that was used in the raid on Ningbo was a Mitsubishi Ki-21 – a two-engine bomber that was seen as one of the best in its class worldwide in the years before the Second World War.

After pursuing licensed production of German aircraft for many years, the Imperial Japanese Air Force invited bids on the design and construction of an entirely Japanese bomber that would not rely on imported technology.⁵¹ It must be able to take off from an airstrip shorter than 300m, climb to 3,000m in eight minutes and maintain an average speed of at least 300km an hour for five hours. All this with a bomb load at least 750 kilos. The fuselage and engine must also be able to cope with extreme cold, since war with the Soviet Union was deemed likely and could be waged as far north as Mongolia.⁵² These were tough demands, on the very margins of feasibility.

Mitsubishi was the firm that won the bid. Its draft exceeded the specifications, involving an eye-catching streamlined metal fuselage for a five-strong crew: two pilots, a navigator who doubled up as a bomb aimer, and two gunners, one of whom acted as wireless operator.

From autumn 1938, Mitsubishi's Ki-21 aeroplanes were deployed in the Sino-Japanese war that had already been underway for a year. As long as they were on relatively short missions, escorted and protected by dedicated fighter aircraft, they were a success. But on solo missions towards the outer edges of China, their weaknesses became clear. In order to meet the ambitious specifications, the weight had been reduced to a minimum. The weight savings were focused on the defensive armament, and the aeroplane had no armour plating around the cockpit and turrets; most importantly, though, it lacked self-sealing fuel tanks. Such tanks, which had gradually become standard on most bombers, included an extra internal layer of rubber that swelled up to plug the gap if the tank was hit. In the Ki-21, the fuel ran straight out, and easily caught fire.

The Mitsubishi factory soon produced improved versions of the aeroplane, which also had more powerful engines and a larger bomb bay. At the same time, the large greenhouse canopy was replaced with a more effective gunner's turret, which could be rotated using a pedal-driven mechanism. Although the Ki-21 aeroplanes were never on a par with American fighter aircraft after Japan entered the Second World War in 1941, the Imperial Air

Force continued to send them out on bombing raids throughout the whole Pacific region – as far as India and Australia. But the losses were large. In a single operation against Rangoon, a total of 20 Ki-21s were shot down, while the Americans lost only two fighter aircraft.

[...]

14. Trumpets of Jericho

In his short story entitled *The Little Shoemakers*,⁵³ Polish author Isaac Bashevis Singer tells the story of God-fearing Abba Shuster in Frampol, a village at the foot of the Radzińska hills a few dozen miles south of Lublin in Poland – “no bigger than a dot in a small prayer book”. He was from an old Jewish family of shoemakers. “People who suffered from chilblains, corns, or varicose veins were especially pleased with his work, claiming that his shoes relieved them.” In the 1930s, many Jewish people emigrated to America to seek their fortunes, but Abba Shuster decided that all seven of his sons would be trained as shoemakers in this town, which he considered the finest place on Earth. He was quite deaf to the newly arrived and slightly snobbish housekeeper, Shifra Zirel, with her complaints about the mud in the streets, “the clay taste of the well water, and the lumpy home-made bread.”⁵⁴

The shoemaker’s workshop was on a hill on the outskirts of the settlement. From the windows, Abba Shuster could look out over the whole village, observing “the groups of matrons who gathered every morning at the butcher stalls and the young men and idlers who went in and out of the courtyard of the synagogue; the girls going to the pump to draw water for tea, and the women hurrying at dusk to the ritual bath.”⁵⁵

One morning as he let his thoughts wander, he suddenly heard a tremendous crash that shook his bones, “The blast of the Messiah’s trumpet! He dropped the boot he had been working on and ran out in ecstasy.” But it wasn’t the prophet Elijah come to proclaim the Messiah’s kingdom. It was German bombers. The town was already in a panic. “A bomb fell near the synagogue, so loud that Abba felt his brain shudder in his skull”.

In the end, everything exploded. “Shaking with fright, his knees knocking together, he re-entered the house and packed a sack” with the most necessary things, including his shoemaker’s tools and the money he had hidden in a straw mattress. Then, all at once, the house caught fire, the walls caved in and the roof collapsed. “Abba turned about and saw the shelf of sacred books go up in flames. The blackened pages turned in the air.”

It was 13 September 1939, less than two weeks into the Second World War. Most of Frampol’s inhabitants probably considered it a pretty shabby place, with its rows of partly collapsed houses, large and small, built of bricks or logs and generally with wooden-tiled roofs. From the air it presented a pretty different impression. For some reason or another, Marek Antoni Butler, who founded the town in the early 1700s, had decided it should be designed according to strict Renaissance principles. The town’s districts and street layout created a series of concentric rectangles, whose midpoint was a similarly rectangular square in front of the town hall. In other words, as the Germans saw it, it looked like the ideal target. A perfect practice range for bombers, as it enabled them to assess the effect of different bomb types, methods of attack and aeroplane types more effectively, as well as the Luftwaffe’s actual skills.

And the test bombing could take as much time as was needed. There were no anti-aircraft guns here, indeed nothing of any military interest – no soldiers, barracks, fortresses, traffic hubs or industry. Apart from the opportunity for practice, it is difficult to think of any reason for the attack other than that more

than half of the town's 3–4,000 inhabitants were Jewish. The Reich Commissioner of Aviation, Hermann Göring had long been a declared anti-semitic.

The aeroplanes came from the VIII Fliegerkorps based in East Prussia. The regiment had already carried out the first air raid of the war on Wielun, further west, and had later bombed its way further across Poland.

Sturzkampfgeschwader 76 participated with Junkers Ju-87 Stuka dive-bombers, which had been assigned a key role in the so-called Blitzkrieg – a form of warfare that exploited the element of surprise and was executed with tremendous power and precision. There was no point releasing the bomb load somewhat arbitrarily from a great height. In the dive-bomber, the pilot was supposed to follow the bomb almost to the very target – to look the victim in the eye, so to say.

The first Stuka came to Germany in late 1924, after being manufactured in secret by a German shell company, Ab Flygindustri, in Limhamn, Sweden. The process was the same as for the Junkers 36 that Mitsubishi later developed into the Ki-1 model, and we can see a few common traits – a kind of Junkers hallmark.

The Stuka came equipped with a 450hp Jumo engine and both its construction and the casing were made of duralumin. The aeroplane also had inverted gull wings, with a marked inboard kink. This meant there was space for larger bomb loads beneath the belly, without requiring overly large fixed undercarriage. Beyond this, it was a simplified construction in which most elements were cut to the bone to ensure the structural strength needed to perform the dives.

At first glance, it might seem as if aesthetic considerations were totally absent. But this isn't the case. The designers have observed conventions of harmony and beauty just as they have been used, with small variations, since ancient times – from the Greeks' golden mean to the proportional system for column construction of the Roman architect Palladio. The aeroplane is stylistically consistent and elegant, but it is also an example of what the Italian philosopher Umberto Eco describes as the "beauty of monsters"⁵⁶ – because the Stuka was one of the most feared aircraft ever.

A warplane's design is not merely indicative of technological and cultural superiority; its capacity to arouse fear is also a criterion, although this is seldom or never explicitly stated in the specifications from the client. It's just the way it has been.⁵⁷ The manufacturer therefore has two options. He can exploit what Freud called *Unheimlichkeit* – the disquieting within a familiar, intimate and otherwise pleasing context. Or he can aim straight for the barbaric and monstrous. Curiously enough, nobody has opted for the Freudian approach, although one could easily imagine the paralyzing effect an intentionally clownish aeroplane could achieve. Instead, more banal and obvious horror effects are selected. But even within this framework, the designers have truly achieved it with the Stuka, which looks like a macabre cross between a daddy longlegs and a bird of prey.⁵⁸ And they took it one step further, mounting small propeller-driven sirens made of wood near the top of the main gear legs. These produced a characteristic howl that increased in volume, rising to a shrieking treble as the speed of the dive increased. In the end, the effect was so deafening and terrifying that it was later included as a standard in most war films – with or without Stukas – just to achieve the atmosphere.

The air friction in the sirens reduced the speed by between 10 and 20km per hour. Nonetheless, the Germans thought it was worth it. More than ever, the victims on the ground felt personally hunted.

You feel the bomb coming, even if it falls 50 or 100 yards away. You throw yourself to the ground, certain of being blown into thirty pieces. And when you realise it was only a miss, the noise of the shrieking takes the ground right out from underneath your feet.⁵⁹

But the crew were troubled by it too. After 1941, the propeller-driven sirens were replaced with cardboard pipes on the bombs themselves, known as Jericho trumpets.

[...]

19. Aircraft construction in the GULAG

Andrei Nikolayevich Tupolev, director of the central design office at Moscow's TsAGI – the Central Aerohydrodynamic Institute – was arrested on 21 October 1937 by the NKVD, the Soviet Union's secret police, along with all 150 of the office's employees. They were charged with espionage, sabotage and aiding the Russian fascist party. In fact, this was simply a continuation of the purges of academics that Josef Stalin had already been carrying out for several years. He was profoundly distrustful of intellectuals in general: they were class enemies and represented everything the Revolution was supposed to put behind it – elitism, bourgeois culture and other academic inclinations that were far removed from everyday life.

If lawyers, philosophers and historians were relevant in this context, it seems a bit rash to include engineers too. Throughout history, there has rarely been a professional grouping more loyal to its leaders, irrespective of politics or ideology. But if the Stalin regime was lacking in a sense of history, it was more than aware of how important the engineers were for the modernisation of Soviet society. After the most suspect individuals had been executed, the rest of them were allowed to continue working in special re-education camps in what was popularly known as the *sharashka* system.⁶⁰ The camp management ensured focused goals, close monitoring and discipline. There was no starvation or torture. Everybody got all they needed in the way of food, clothes and cigarettes. "It was clearly a prisoner's craftwork; that is, the most painstaking work in the world, for prisoners have nowhere to hurry to,"⁶¹ according to the Russian author Aleksandr Solzhenitsyn, who describes his own experiences of the *sharaska* system in "The First Circle". And those who didn't cooperate risked deportation to much worse conditions in Siberia.

The camp for the aeronautics engineers of TsAGI was set up as *Tsentralnoye Konstruksionnoye Byuro* – the Central Design Bureau – in Bolshevo, on the outskirts of Moscow. Tupolev agreed to continue as director and, since he was indispensable, he was able to name his own terms. He had always been a homebody: his family was second only to his passion for aeroplanes. He was allowed to maintain a correspondence with his wife Julia who was interned in a different camp, and their children were permitted to continue living at home in Ulitsa Kaliaeva (today Dolgomilovskaya Ulitsa) with their old nursemaid.⁶²

Andrei Nikolayevich Tupolev grew up in straitened circumstances in the village of Pustomazovo, 100km north of Moscow, where his parents ran a smallholding. Unlike his equally aircraft-obsessed countrymen Igor Sikorsky and Alexander Seversky, who emigrated to the US, he remained in Russia after the revolution. After finishing his engineering studies and working for a period as a teacher at Moscow's Higher Technical School, he took over as head of TsAGI's design department in 1929. He was joined by the promising engineer Vladimir Mikhailovich Petlyakov, who was a specialist in wing design. Together, they constructed passenger aeroplanes as well as fighter aircraft and bombers, including the enormous propaganda aircraft Maxim Gorky, ANT-20 – Andrei Nikolayevich Tupolev's 20th model. With a total of eight engines, a cinema, a photo lab and radio station, and a wingspan of 63 metres, it was most decidedly the world's biggest aircraft ever.

When Tupolev and Petlyakov were arrested, they were in the process of completing test flights on a four-engine bomber, the ANT-42. The first designs were started in summer 1934, based on a set of apparently unrealistic specifications – typical of a dictatorship. The aeroplane should carry at least two tonnes of bombs 4,500km – roughly a return trip from Moscow to Paris – at an average speed of 440km per hour. And it should fly at an altitude of 30,000 feet, in other words, well beyond the reach of artillery and fighter aircraft. After the prototype was tested, the constructors noted, with astonishment, that all these specifications were achievable – and could be exceeded in the case of the bomb load, which could be increased to five whole tonnes.

The ANT-42 was built of duralumin, with powerful steel spars to stiffen the wings. The fuselage had a pear-shaped cross-section and was so narrow at the top that the two pilots had to sit one behind the other, each on their nine-millimetre steel plate. Behind them sat the wireless operator on a slightly narrower steel plate, and in the more spacious belly below him sat a flight engineer and a bomb aimer, right in the nose. A number of machine gun positions were distributed around the aeroplane. As in Germany's Staaken, from the First World War, two of them were in the inboard engine nacelles and could only be reached if the operators crept on all fours through the wing ribs. All in all, the crew numbered 11 men.

The engines needed to be very powerful to achieve the necessary acceleration, climb and lift – almost 4,000hp distributed over four traditional piston engines. In addition, a fifth engine was mounted inside the fuselage. Its sole purpose was to drive a compressor that would blow extra air into the other engines under high pressure. This boosted the engines' power and ensured that high speeds could be maintained at great altitudes, where the air was thinnest.

All indications were that the ANT-42 would be the most powerful bomber in the history of aviation, and that even the Americans with their B-17 Flying Fortress would have to admit they were beaten. But after the arrest of Tupolev and Petlyakov, the test flights were cancelled before all the details were fixed – for a period at least.

It is therefore uncertain whether the ANT-42 took part in the Russian bombing of Finland during the Winter War that started three months after the outbreak of the Second World War. The attack probably involved older, ANT-6 aeroplanes – Tupolev's sixth type, which was already on the drawing board in the late 1920s. The bombing raids started with a 30-plane attack on the capital of Helsinki at dawn on 30 November 1939. Other towns followed, in a campaign that lasted more than a hundred days, and there was no indication that the pilots made any obvious distinction between civilian and military targets – although the Russians firmly refuted any such accusations. When the American president Roosevelt – who was still sticking to the 1907 Hague Convention – sent protests to Moscow, he received an abrupt response from the Foreign Minister, Vyacheslav Molotov: "Soviet aircraft have not been bombing cities, but airfields, you can't see that from 8,000 kilometres away in America."⁶³ He claimed that the photographs being circulated were fake and from the First World War. In fact, he claimed, they had dropped bread baskets for starving Finnish workers. The Soviet bombs soon earned the nickname *Molotov's leipäkori* – Molotov's bread baskets. Their proper name was RRAB3 and they were sophisticated bombs the size of an

average sentry box with a cluster of incendiary bombs built in. The Finnish forces responded by attacking Soviet tank forces with much simpler incendiary devices. These would ever after be known as Molotov Cocktails, understood as “a drink to go with the food.”⁶⁴

[...]

23. Antichrist in the Jungle

When Alan Hunt, lieutenant and pilot-in-command of the 49th Squadron of the British Royal Air Force, returns from his bombing mission over the wooded hills of Mount Kipipiri in Kenya on 19 February 1955, he feels an urge to pep up his return – maybe from euphoria after a successful mission or simply to show off. Whatever the case, he sends his aeroplane into an unauthorised dive over the police station on top of the hill outside the village of Githunguri, where his colleagues are whiling away the afternoon with cards and gin and tonic. The roar rattles the small building and sends his colleagues storming for the door, just in time to see the aircraft pulling out of its dive at top speed. But Hunt doesn't leave it at that. He repeats the manoeuvre and on the third run it goes horribly wrong. The accident report reads as follows:

Hunt misjudged the height needed to clear the top of the hill with the result that parts of the starboard wing, tail plane and lower rudder were torn off after hitting three rondavel huts and a mess chimney, whereupon the aircraft went out of control, climbed steeply for about one hundred meters, then stalled before going into a near vertical dive and crashing half a kilometre south of the police station.⁶⁵

Lieutenant Hunt's attempt to show off was, of course, unauthorised. But if he'd survived, it's uncertain whether he would have got more than a gentle pat on the shoulder, and perhaps a spot more respect. By and large, he would just have confirmed the prevailing impression of pilots as tough and devil-may-care.

From the beginning of the Second World War, films about flying had already made an appearance on cinema screens in the US and Britain. Many of them dealt with bombers and their crews, like *Target for tonight* (1941), *One of our aircraft is missing* (1942), *Aerial gunner* (1943), *Bombardier* (1943) and *Wing and a prayer* (1944). All of them are more or less in the same mould: we follow one or more main characters all the way from conscription, through training and up to the first bombing missions over Germany or Japan. The stories almost always include a reckless rascal who consistently goes his own way and ultimately turns out to be the best pilot of them all. After making the obligatory dive in which he misses the officers mess by a hair's breadth, he is grounded but ends up saving his honour through his bold heroism – for example by rescuing colleagues who have crashed in a field behind enemy lines. This trope is what we expect. A war film would scarcely work without it.

Lieutenant Alan Hunt's sole excuse must be that he had seen too many of these films. The unfortunate result was that he and four of his crew were killed instantly, while the tail gunner, Sergeant Stanley Bartlett, survived the crash itself but died of his injuries five hours later. In addition, four civilians were killed on the ground, including a child. The six crew members were buried with full military honours at Nairobi's City Park Cemetery. About the aeroplane – registration number SX984 – the report drily states: "Written off (damaged beyond repair)."⁶⁶

The aircraft was an Avro Lincoln, developed from the Avro Lancaster, with improved bomb capacity and more powerful armament. It also had a greater range, higher top speed and operational altitude, and an autopilot nicknamed George installed in the cockpit. Based on signals from the gyroscope, compass and speedometer, that at least made the flights a bit more comfortable for the pilots. In addition, the aircraft's proportions are changed: the fuselage has been extended and the nose has had a stronger plexiglass dome fitted so that the bomb aimer can sit instead of kneeling on all fours. And, as expected when more or less improvised additions are made to existing types, it ends up with an unintended appearance – this time an unmistakable resemblance to a dozy gun dog with an overbite.

The Avro Lincoln was intended to play a role in the conquest of Japan. The plan was to build more than 2,000 of them, but as the war was obviously drawing to a close, the number was cut by a third. The aeroplane was never used in battle until the whole thing was over.

When Great Britain later scrapped much of its bomber fleet, it kept the Lincoln aircraft, since these were the most advanced heavy bombers available to it. The aeroplane thereby became the last type powered by piston engines before jet engines took over. Still, in the immediate post-war period, it was good enough. Like the French, the British were now under pressure to combat rebels in the colonies, and the uppermost surface of the Lincoln aircraft was painted white to reflect the sun's heat in tropical climes.

Lieutenant Alan Hunt had been on a mission in the British colony of Kenya during the so-called Mau Mau rebellion. A small group of white landowners had control over a black population of five million whose land had been confiscated in the late 1800s. The regime was arrogant and brutal, and fewer than fifty years before, the British governor, Sir Charles Eliot, had proclaimed: "There can be no doubt that the Masai and many other tribes must go under. It is a prospect which I view with equanimity and a clear conscience."⁶⁷

Many thousands of Kenyans had volunteered to fight with the Allied forces in the Second World War. They had observed that the British had signed the Atlantic Charter, which could scarcely be interpreted as anything other than an indication of imminent decolonisation. Consequently, they were profoundly disappointed when the British authorities failed to deliver and decided to maintain white rule in Kenya.

The unrest is greatest among the Kikuyu people. They belonged to Kenya's largest population group and mostly earned a living as farm workers and housemen for the British farmers. When the rebellion started in 1952, they were immediately cast as terrorists and the British press referred to them as primitive natives who were slitting the throats of white women and children, driven out of their minds by drugs, rites and sex orgies.⁶⁸ In reality, only 32 white civilians are killed in the entire conflict, which lasted until 1960 – many fewer than died in Nairobi's traffic over the same period. On the Kenyan side, at least 13,500 people were killed in the fighting.⁶⁹ In addition, 150,000 people were interned in concentration camps, where many faced torture and some died.⁷⁰

Other than 30,000 foot soldiers, British combat units attacked using large and small aircraft. Eight heavy Lincoln aeroplanes were sent south in November 1953, on direct orders from Winston Churchill, who had taken over again as

prime minister in 1951 at the age of 76. In his previous administration, he had already removed any room for doubt about his own attitude: "I have not become the King's First Minister in order to preside over the liquidation of the British Empire."⁷¹

The British were up against 12,000 Mau Mau rebels, only just over ten per cent of whom had proper firearms. The rest were armed with homemade rifles and swords.⁷²

[...]

29. Frankenstein in Baghdad

Outside the door of the security council in the UN's building in New York hangs a copy of Picasso's *Guernica*. Executed in textile, it is the same size as the original – 3.5 x 7.5 metres – although it looks a bit browner, with sharper contrasts.

On 5 January 2003, the picture was veiled with a blue curtain.⁷³ The American Foreign Minister, Colin Powell, had called a meeting to make the case for an attack on Iraq for the second time since the Cold War. Under the Geneva Convention, only the UN can authorise such attacks, which must be for the purpose of humanitarian intervention to protect civilians and, in the worst case, prevent genocide.

In late summer 2002 – roughly a year after the terror attack on the Twin Towers in New York, the US president George Bush introduced the guidelines for a new foreign and security policy, the so-called Bush doctrine. He claimed that the US was now on a global war footing, facing an enemy united in a shared ideology of hatred for democracy. The somewhat defensive intimidation policy of the Cold War would be replaced with a more proactive strategy based on preventative military operations combined with active dissemination of the American democratic model.

Americans are a free people, who know that freedom is the right of every person and the future of every nation. The liberty we prize is not America's gift to the World, it is God's gift to humanity.⁷⁴

As early as 2001, the American Defense Department had already developed a plan for overthrowing regimes that were not aligned with US interests.⁷⁵ They envisaged time-limited operations involving rapid withdrawal after the regime had been replaced with more amenable leadership.

In his presentation to the Security Council in 2003, Colin Powell claimed that Saddam Hussein's regime in Iraq had an arsenal of weapons of mass destruction, including poison gas, and that there was a high risk these would be used against the country's own inhabitants, especially the Kurds in the north. His proof consisted of low-resolution drone photographs of mobile laboratories for the production of biological weapons. The documentation, which later proved to be entirely fake, wasn't good enough to convince the UN.⁷⁶

On 18 March 2003, a US-led coalition sent bombs to Baghdad anyway. An overwhelming pre-emptive attack would crush the country's fighting spirit and paralyse the enemy before it had a chance for reflection.⁷⁷ This was in line with the historical strategies of Giulio Douhet and Billy Mitchell, and a strategy that, to Curtis LeMay's great despair, was not pursued in either Korea or Vietnam.

In 1996, the principles were re-launched under the slogan of Shock and Awe by the retired general Charles Horner and private defence expert, Harlan K. Ullman. They pointed to the success of the German Blitzkrieg on Poland and the use of atom bombs on Japan. "The Japanese simply could not comprehend the destructive power carried by a single airplane. This incomprehension produced a state of awe."⁷⁸

The problem was the potentially high civilian cost. After the Vietnam War, the Americans had clearly become more soft-hearted when it came to their own lives and those of their opponents.⁷⁹ The order of the bombing raids was therefore organised in line with the almost antiseptic concentric circle model of the military theorist, John Warden.⁸⁰ Here, the country's leadership is placed at the centre and must be attacked first. If you manage to "cut off the snake's head", the whole house of cards may, in the best of cases, come tumbling down. In the next circle beyond that are targets that ensure necessities such as electricity, oil, water, food and currency, while the third circle encompasses technical infrastructure such as roads and airports. Only when all this has been attacked without success can the fourth circle be considered: the civil population. But nobody in the American leadership believed this would be necessary.

Ahead of the attacks, Harlan Ullman had already described the expected course of events to the CBS news channel.

You're sitting in Baghdad and all of a sudden you're the general and 30 of your division headquarters have been wiped out. You also take the city down. By that I mean you get rid of their power, water. In 2, 3, 4, 5 days they are physically, emotionally and psychologically exhausted.⁸¹

While a methodical approach like this had hitherto only been of academic interest, many now claimed it was achievable: in the preceding years the arms industry had developed a new generation of precision weapons, so called smart bombs. Once the newly acquired power of computers was hooked up with satellite-based navigation systems, this would ensure almost "clinical" operations and "surgical" attacks. A bombing raid should, in principle, be carried out without the civilian population being aware of it – almost like an old-fashioned duel in a secluded field.

[...]

30. Swansong over the desert

I often go for walks along the shingle beach below my house in Lista. That's what I was doing on 2 January 2013 too. It was a stormy day and choppy waves from the west whirled clouds of foam inland. In a bay where I'd once found a rubber dinghy, I caught sight of an apparently intact wetsuit among the stones. But there turned out to be more to it than met the eye. Brownish-yellow shinbones protruded from the wetsuit and continued into a pair of swimming flippers. I picked the bundle up in my arms and bore it to safety, some fifty metres further inland.

A couple of Norwegian journalists later found out that these were the remains of a Syrian named Shadi Omar Kataf. Along with a friend, he had tried to swim across the Channel to England, where his uncle lived and where he hoped to forge a safe future. His friend had washed up on a sandy beach in the Netherlands two months earlier, while he ended up on the shingle beach of Lista.⁸²

Shadi Omar Kataf reached the age of 28. At the beginning of the civil war in 2012, the brick house of his large family in the Al Qadam district of Damascus was bombed to rubble by the aircraft of the government forces. His family sought refuge in the overcrowded Yarmouk refugee camp, only to be bombed again that same autumn. The situation in the camp rapidly became critical and the Guardian newspaper described it as "the worst place on Earth": people ate grass and cats to survive. But by then, Shadi had already moved on, first making the arduous journey west to Libya, then crossing the Mediterranean and travelling through Italy and France to the port of Dunkirk by the English Channel. Here he bought himself the cheapest possible wetsuit and started swimming.

"There is always a cost to defeat an evil. It never comes free, unfortunately. But the cost of failure to defeat a great evil is far higher."⁸³ This assertion was made by NATO spokesman, Jamie Shea, in the wake of the Kosovo War in 1999, in which NATO – without UN approval – carried out extensive bomb attacks on Serbia to "prevent a humanitarian catastrophe".⁸⁴ More than 500 civilians were killed in the operation and the concept of collateral damage became a recurring theme in reports.

The rhetoric of war has a habit of wrapping the unpalatable facts up in creative terminology. During the Second World War, officers and politicians talked about *strategic bombing* even though everybody knew civilian areas were being carpet-bombed. *Collateral damage* was introduced during the Vietnam War to conceal the unavoidable results of attacks using cluster bombs, incendiary bombs, and chemical and biological weapons, and it was subsequently used in most of the wars that followed – in Libya, Afghanistan and Somalia, not to mention the civil war in Syria, which extended deep into Iraq.

Abu Yaman and his family found themselves in the target zone for the American bombing of Mosul on 17 March 2017:

We felt the earth shaking as if it was an earthquake. It was an air strike that targeted my street. Dust, shattered glass and powder were the only things my wife, myself and three kids were feeling. We heard screams and loud crying coming from the house next door.⁸⁵

By the time the bombing stopped, six streets had been wiped out and two hundred deaths could be chalked up as collateral damage. As to how many people later died in refugee camps, or in their panicked flight across the Mediterranean and beyond, fleeing to what they hoped would be safety; of that, we know nothing.

[...]

-
- ¹ VG 27 September 2010
 - ² Robert Warshow, cited in Fishwick, 1954
 - ³ Carroll, 207 (p. 11)
 - ⁴ Grossman, 1996 (p. 55)
 - ⁵ Rachman, 1978
 - ⁶ Among others, former spy chief Ola Kaldager, to NRK2 on 31 March 2016
 - ⁷ Grossman, 1996 (p. 81)
 - ⁸ Olsen, 2010 (p. XVI)
 - ⁹ According to the French philosopher Roland Barthes, the machine is our era's answer to the Gothic cathedrals; see the essay entitled *The New Citroën* in Barthes, 1999
 - ¹⁰ Wohl, 1994 (p. 69)
 - ¹¹ Wohl, 1994 (p. 59)
 - ¹² Birken, 2014
 - ¹³ Friedrich, 2008 (p. 243)
 - ¹⁴ Birken, 2014
 - ¹⁵ Birken, 2014
 - ¹⁶ Birken, 2014
 - ¹⁷ Birken, 2006
 - ¹⁸ Boulic, 2015 (Chapter3)
 - ¹⁹ Friedrich, 2008
 - ²⁰ Boulic, 2015
 - ²¹ Meriwether, 1919
 - ²² Boulic, 2008
 - ²³ Boulic, 2015
 - ²⁴ Olsen, 2010 (p. 16)
 - ²⁵ Hansen, 2004
 - ²⁶ Corbusier, 1935
 - ²⁷ Wells, 1908
 - ²⁸ Carroll, 2007 (p. 11)
 - ²⁹ Declaration 14.
 - ³⁰ The Foreign Ministry, 1962
 - ³¹ Lanchester 1916
 - ³² For example *Fountainhead* from 1943
 - ³³ Lanchester, 1916
 - ³⁴ Lanchester, 1916
 - ³⁵ From the story *The Aeroplanes at Brescia*, in Kafka, 2000
 - ³⁶ Maclean, 2004 (p. 216)
 - ³⁷ Ferrari, 2014
 - ³⁸ Wohl, 2005 (p. 57)
 - ³⁹ Wohl, 2005 (p. 53)
 - ⁴⁰ Jullian, 1973
 - ⁴¹ Wohl, 2005 (p. 59)
 - ⁴² d'Annunzio, 1921
 - ⁴³ Schnapp, 1994
 - ⁴⁴ From the Futurist Manifesto 1909, cited in Zander, 2016
 - ⁴⁵ From the Futurist Manifesto 1909, cited in Zander, 2016

-
- 46 Daly, 2013
- 47 Daly, 2013
- 48 Nie, 2010
- 49 From Sheldon Harris, *Japanese Biomedical Experimentation during the World War II Era*, Chapter 16 in United States, Army Medical Department, 2004
- 50 From Sheldon Harris, *Japanese Biomedical Experimentation during the World War II Era*, Chapter 16 in United States, Army Medical Department, 2004
- 51 Boyne, 2002
- 52 Francillon, 1967
- 53 Singer, 1976
- 54 From the short story, *The unseen*, in Singer, 1976
- 55 Singer, 1976
- 56 Eco, 2004
- 57 Sadraey, 2012
- 58 Spick, 201
- 59 Wohl, 2005 (p. 235)
- 60 An ironic use of the term *sharaga*, meaning band of unruly thieves and scoundrels
- 61 Solzhenitsyn, 1971
- 62 Duffy, 1996
- 63 Lloyd, 2015
- 64 Lloyd, 2015 (p. 77)
- 65 Richard Bartlett-May son of SGT Stanley Bartlett. RAF Historical Society UK and 49 SQN. <https://aviation-safety.net/wikibase/wiki.php?id=25865>.
- 66 Richard Bartlett-May son of SGT Stanley Bartlett. RAF Historical Society UK and 49 SQN. <https://aviation-safety.net/wikibase/wiki.php?id=25865>.
- 67 Robert B. Edgerton, cited in Lindqvist, 2000 (note 314)
- 68 Robert B. Edgerton, cited in Lindqvist, 2000 (note 314)
- 69 Rosberg, 1996
- 70 Elkins, 2014
- 71 Douglas, 2002
- 72 MacPhee, 1968
- 73 Morris, 2009
- 74 President George W. Bush's State of the Union Address, 28 January 2003
- 75 Hippler, 2017
- 76 Bacevich, 2009
- 77 Bacevich, 2009
- 78 Grosscup, 2006
- 79 Mets, 1999 (p. 59)
- 80 Warden, 1998
- 81 Shiner, 2008
- 82 Fjellberg, 2016
- 83 Krieger, 2001
- 84 Herring, 2000
- 85 Hassan, 2017