

FLIGHT

MAN KIN D'S

SIX STEPS TO

GREATNESS

For many, flight still has a childlike air of the magical about it. As an achievement, it is surely among mankind's most transcendent moments. **Chris Wright** looks at how world aviation advanced, from the pioneers of the late 1800s to the heady heights we've reached today — and asks, where might we be flying to next?

It is mid-May in Toulouse, France, and *Discovery Channel Magazine* is 20 metres above the assembly line of the Airbus A380. The building, one of the largest in the world, is half a kilometre long. Within it, even just within the truncated section we can see from here, due to a concrete firewall that a nervous insurer likely insisted on adding, there are two Emirates A380s taking shape in pre-paint green. A man stands on one of the wings — you can barely make him out amid the vast scale of the jet.

No matter how many times you experience it, flying is special. There are few more transporting feelings than the moment you leave the tarmac, en route to your destination. Yet so everyday has the process become, that even as we mass-produce gigantic flying double-decker buses in the sky, many don't know the exact sequence of how we got to this point — and what was risked and lost in the process.

As David Blatner reminds us in *The Flying Book*, just a century ago, flying was still a dream. "Almost nobody on Earth believed that humans would ever be able to fly in heavier-than-air machines." Prominent scientists proclaimed it impossible; it was better, they thought, to focus on balloons to move us between cities. "Their skepticism isn't surprising," he writes. "To fly is perhaps humankind's oldest dream, and several thousand years of failed attempts are likely to cause more than a bit of doubt."

Of course, we finally cracked it. And when we did, we never looked back. Aviation took off (excuse the pun) in directions at times fanciful or pragmatic, but always unexpected from the perspective of our ancestors. As R. G. Grant writes in his definitive Smithsonian-backed book *Flight*, "Human beings have always dreamed of flight. They did not, however, dream of the Boeing 747." Here are six moments in flight that lifted us to today.



AN OFTEN-REPRODUCED PHOTO BY JOHN DANIELS DOCUMENTING ORVILLE WRIGHT'S FAMOUS FIRST FLIGHT. HE CAN BE SEEN HERE LYING ON THE WING. HOWEVER, NOT ALL OF THE WRIGHT BROTHERS' FLIGHTS WENT SMOOTHLY (OPPOSITE PAGE, LEFT)

01

WRIGHT BROTHERS TAKE FLIGHT



It is common to credit the Wright brothers with the first ever flight — and Orville's 12-second, 120-foot (36.5-metre) journey at Kitty Hawk, North Carolina on December 17, 1903 was indeed the first human-controlled powered flight. Later that day, his brother Wilbur flew 260 metres in 59 seconds. Yet, those famous moments reflected almost a century of innovation and attempt.

Man had already been airborne for well over a hundred years before the Wrights managed it, starting with the Montgolfier brothers in 1783 — though strictly speaking, they first sent up a duck, a sheep and a chicken rather than a man.

In 1809, Sir George Cayley conceived the fundamental idea of an aircraft having one device (a propeller) to move it forward, and another (the wings) to keep it in the air. Cayley had a go at it in practice; as to how it went, we'll just leave you with an understated remark from his granddaughter. "I think it came down in rather a shorter distance than expected."

Later innovators included the Russian Alexander Mozhaiski, who in 1884 built arguably

the first aircraft capable of powered flight (it crashed), and Germany's Otto Lilienthal, who studied gliders and was perhaps the world's foremost pioneer in them, but who never combined it with powered flight. The Wright brothers read about Lilienthal while young; the inspiration led to their own successes.

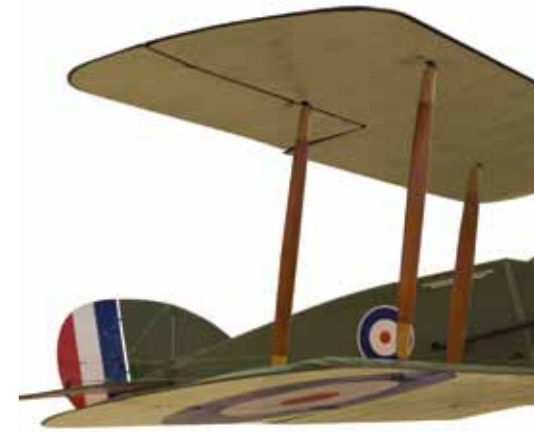
By the turn of the century, people were routinely claiming to have flown, and it's just possible some did so before the Wrights, but without reliable witnesses. In 1901, Gustave Whitehead built a plane in Connecticut and several people say he got it airborne on a number of occasions — some accounts say he once flew for about two kilometres. For years, many claimed that the first flight was by Samuel Langley (it helped perhaps that he was secretary of the Smithsonian), who catapulted an aircraft called the Aerodrome off a houseboat and straight into the Potomac River earlier in 1903.

But what makes Orville and Wilbur Wright different is that their flight was controllable, and had many witnesses who took photographs, among them the wonderful and much-reproduced image by John Daniels showing an airborne Orville, lying flat and face down on the craft's lower wing, while Wilbur, caught mid-stride, looks on. One less well-known fact, however, is that Orville Wright was at least partly responsible for the world's first powered airplane fatality in 1908, when he crashed with a passenger, Thomas Selfridge, who died in the impact.

The key to understanding flight was that flapping wings like a bird was not the point — instead, one had to understand the *shape* of a wing. Planes fly because of something called the Bernoulli effect, named after Daniel Bernoulli. He discovered that the faster a fluid moves (or air, for that matter), the lower its pressure. If you apply this to a wing that is curved on the top and flat on the bottom, the air has to go faster over the top of it, meaning there's less pressure above the wing than below it, and effectively the plane gets sucked upwards. There's a lot more to it than that, but the basic premise begins there.

Many understood this, but the Wrights were set apart by their rigour in study and experimentation. "Their ingenuity and persistence as methodical experimenters was matched by their physical bravery as test pilots," writes Grant. They also trusted absolutely nobody outside their own family, and sued anyone they thought had wronged or infringed them.

What is really remarkable though, is how quickly things moved on after the Wright brothers. In July 1909, Louis Blériot flew across the English Channel from France to England. By 1911, eight years after that first halting flight in North Carolina, Calbraith Perry Rodgers flew across the United States — though it took him 49 days, and he crashed at least 19 times. "By the end of the flight, he had replaced every part on the airplane, except a rudder and one wing strut," writes



Blatner. By 1914, the first known scheduled passenger airline service was launched between the US cities of Tampa and St. Petersburg, in Florida. And by then, there was another reason to take to the air.

02

AIRCRAFT GO TO WAR



As Grant writes, somewhat ominously, "Aircraft found their first practical use as instruments of war."

According to Blatner, it was August 1910 — less than seven years after the first powered flight — that Jacob Fickel became the first man to fire a gun from an aeroplane, shooting at targets on the ground from a Curtiss biplane over Sheepshead Bay, New



York City. Just a few short years later, doing so would become the norm, as World War I kicked off in 1914.

"Aviation matured under the stress of combat," says Grant in *Flight*. How so? Well, for the first time, aircraft were operated daily, which in turn brought new requirements, revolving around factors like servicing and reliability. Plus, anything that made a plane faster, more powerful and more resilient, became vital.

"Suddenly, the idea of air superiority was born, and who controlled the skies could clearly influence who controlled the ground," writes Blatner. "An enormous effort went into building faster aircraft that could carry guns and bombs."

At first, the fleets of flimsy monoplanes and biplanes were used simply to ferry an observer over the countryside, to obtain a better view of enemy troops. Both sides saw this reconnaissance role as vital: Grant writes that the German General Staff stated back in 1914 that "the duty of the aviator is to see, not to fight".

Getting weapons onto the tiny planes of this time was not straightforward. "There was a serious risk of blowing bits off your own machine, with its array of struts and wires," says Grant. Though some did try, he adds — and the first recorded air-to-air kill took place on October 5, 1914, when Frenchman Louis Quénault shot down an Aviatik from a Voisin 8.

One remarkable innovation came when designers worked

out how to use an interrupter gear to pause a machine gun each time a propeller blade was in its line of fire, allowing pilots to fire straight through their own propellers. The Germans in particular, notably through the Fokker Eindecker, did this. The Allies, meanwhile, tended to opt for wing-mounted guns.

World War I invented the idea of the ace, the knight of the air — none more so than the famed German Baron Manfred von Richthofen, the famous "bloody" Red Baron, who logged 80 kills.

Mass production soon arrived in aviation, with thousands of new planes built. Britain started the war with an aircraft industry dependent on imported French engines, and ended it with an industry employing 270,000 workers (some sources put it at almost 350,000). Engines started the war at 80 horsepower, and ended it at 400. Bombers were developed too. By the Armistice in November 1918, "aviation had come of age in a war of mass slaughter driven by industrial technology," says Grant. "Flight had lost its innocence."

03

LINDBERGH, EARHART AND LONG DISTANCE



"Almost overnight," writes Blatner, "Charles Lindbergh's 1927 solo flight across the Atlantic changed American attitudes about flying. After his record-setting flight, Lindbergh

travelled around the United States and the world, preaching that airplanes were the future of transportation — and people believed him."

This is the point about Lindbergh. It wasn't his deeds, so much as their influence. Lindbergh was actually not the first to fly across the Atlantic; he was the first to fly solo, non-stop, from New York to Paris. Eight years earlier, John Alcock and Arthur Brown had flown non-stop from St John's, Newfoundland, to Clifden, in Ireland, in 1919. Yet you never hear of them.

Lindbergh's place in history arguably has as much to do with his personality and America's need for a hero at the time. As Blatner writes: "In 1927, the United States was bounding from a rural economy to a technological powerhouse. Who could better represent the hopes and dreams of the country than a farm boy with a passion for flying?" Also, his flight coincided with innovations in media, as photographs could be transmitted by wire, while news spread fast through the radio.

The Lindbergh flight actually came about as an entry in a competition, launched by a hotel owner called Raymond Orteig for the first non-stop flight from New York to Paris. Many died trying — six, by the time he flew.

"Into this melee stepped a quiet, handsome, confident aviator, who proposed to fly alone in a small, single-engine airplane," says Blatner. "Backed by a consortium of St. Louis businessmen, he represented the common American, the underdog, whose guts and moxie could conquer staggering odds. He would forgo a parachute and a life raft so he could carry more fuel. He'd take five sandwiches with him, explaining: 'If I get to Paris, I won't need any more, and if I don't get to Paris, I won't need any more either.' Americans adored him."

Lindbergh was not all show: he was an excellent pilot, a brilliant navigator, and strong. His flight was part endurance — he hadn't slept the night before the attempt, waiting for suitable weather, then had to stay awake for a further 33.5 hours of flight. It was part skill too, as he navigated through darkness, freezing cold and thick

LEFT: A WORLD WAR I BIPLANE. THIS PERIOD OF CONFLICT WAS WHEN AIRPLANES PROVED THEIR WORTH AS MACHINES OF WAR
BELOW LEFT: THE BOEING 247, USUALLY CONSIDERED THE WORLD'S FIRST MODERN AIRLINER



PHOTOS: CORBIS (MAIN); GETTY IMAGES (WORLD WAR I BIPLANE); BOEING (BOEING 247)

THE LINDBERGH BOOM

Having completed his milestone flight from New York City, in the United States to Paris, France, Charles Lindbergh and his plane, the *Spirit of St. Louis* (pictured here flying past the Eiffel Tower), which he had helped design, became instantly famous. His feat led to a period known as the Lindbergh Boom, a two-year span from 1927 to 1929 or so. During this time, aircraft industry stocks rose in value, and the general public rapidly developed an interest in aviation.

This fuelled a change in perception, allowing air travel to gain traction as a viable alternative to cars and trains.

fog, yet still reached the Irish coast on course. And his flight on the *Spirit of St. Louis* had a lot to do with the development of commercial flight thereafter, since the sense of romance he brought to it coincided with more affordable flight, and eventually with more comfortable aircraft.

Nor was he the only one. Just a year after Lindbergh's flight, Amelia Earhart became the first woman to fly across the Atlantic

LINDBERGH'S PLACE IN HISTORY ARGUABLY HAS AS MUCH TO DO WITH HIS PERSONALITY AS WELL AS AMERICA'S NEED FOR A HERO AT THE TIME

— albeit, to her chagrin, as a passenger. She repeated the feat solo four years later, proving herself an exceptional pilot. She then flew solo from Hawaii to California, the first person ever to do so, in 1935; and later vanished while attempting to fly around the world in 1937, somewhere in the Pacific Ocean near an intended scheduled stop on Howland Island.

Elsewhere, France had Dieudonné Costes, who crossed the South Atlantic; Italy had Francesco de Pinedo, who flew a flying boat across the Atlantic; and Britain had Amy Johnson, who flew solo from England to Australia in a de Havilland Moth.

These aviators helped to encourage people to become passengers, aided by improvements in the aircraft themselves. From the pilots' perspective, several breakthroughs in instrumentation came through in the 1930s, and from the passengers' point of view, technology brought comfort. The Boeing 247, launched in 1933, is often considered the first modern airliner, and it led indirectly to the creation of the

first megastar aircraft, the Douglas DC-3. The founder of Douglas Aircraft Company was commissioned to build it by Transcontinental and Western Airlines — after the airline learned that all early Boeing 247s were reserved by rival United Airlines. Remarkably, Blatner says that by 1939, 90 percent of all airline traffic worldwide was on a DC-3.

Nor was this a purely American phenomenon. Grant says the biggest airline in the world at the time — accounting for maybe 40 percent of all passenger air traffic worldwide when it was formed in 1926 — was Deutsche Luft Hansa, which in 1933 became Lufthansa. Among other innovations, the German airline pioneered night-flying on passenger aircraft, and by 1931 it was flying passenger services over the Alps. The airline also screened for its passengers the first in-flight movie.

It's interesting to reflect that back in these early days of commercial aviation, one of the most effective ways to market air travel was to tell people about the amazing views. Until then, few had seen the world from so high before — and offering people this new perspective on the world proved to be a great drawcard.

On the other hand, the experience was not always comfortable. Planes at this time were still not pressurised, so they could not fly above bad weather. Thankfully for those with weak stomachs, in 1938 Boeing launched the pressurised 307 Stratoliner. Though by then, aviation innovation was once again set to be overtaken by the drumbeat of war.

04

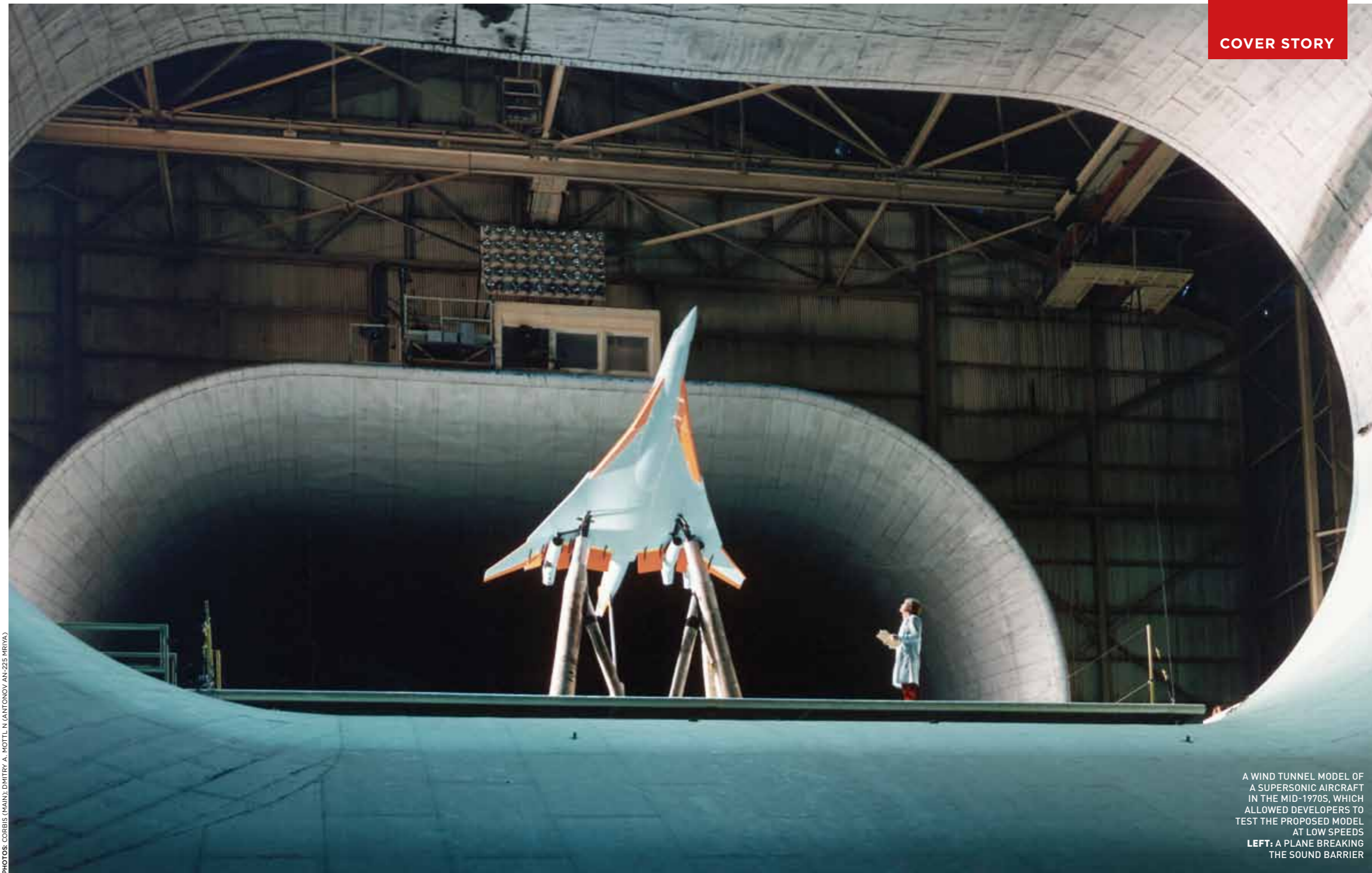
THE LIFE AND DEATH OF SUPERSONIC



World War II brought huge innovation to flight again, most of it geared towards tragic destruction. But some of it had positive lasting effects.

The jet engine had actually been invented in the 1920s, by the Englishman Frank Whittle. But it wasn't until the war, and the clear military application of greater speed, that they were widely used on fighter jets — starting with Germany's Messerschmitt Me 262s.

When the war ended, two things happened. One, there was plenty of military technology that could be used in commercial aircraft. The Lockheed Constellation had originally been designed for military cargo, before being revamped for passenger travel, becoming a hugely popular aircraft in North America. Second, a host



PHOTOS: CORBIS (MAIN); DMITRY A. MOTTILIN (ANTONOV AN-225 MRIYA)

A WIND TUNNEL MODEL OF A SUPERSONIC AIRCRAFT IN THE MID-1970S, WHICH ALLOWED DEVELOPERS TO TEST THE PROPOSED MODEL AT LOW SPEEDS
LEFT: A PLANE BREAKING THE SOUND BARRIER

ICONS OF FLIGHT

ANTONOV AN-225 MRIYA

ONE OF THE BIGGEST AIRPLANES IN THE WORLD, THIS UKRAINIAN GIANT IS AN ABSOLUTE BEAST FOR CARRYING HEAVY LOADS. IN 2002, IT FLEW FROM GERMANY TO OMAN, SHIPPING 216,000 PREPARED MEALS FOR AMERICAN MILITARY PERSONNEL. THAT CARGO WEIGHED 187.5 TONNES (THAT'S HEAVIER THAN A BLUE WHALE), BUT STILL DOESN'T COME CLOSE TO ITS **MAXIMUM PAYLOAD OF OVER 250 TONNES**. MEANING THE AN-225 COULD CARRY 40 ADULT *T-REX*'S — PROMISING AN EVENTFUL FLIGHT



AIR FORCE ONE

MANY THINK THIS NAME REFERS TO THE PLANE THAT FERRIES THE PRESIDENT OF THE UNITED STATES. BUT IT IS ACTUALLY AN **AIR TRAFFIC CONTROL CALL SIGN**. THUS, ANY US AIR FORCE AIRCRAFT CARRYING THE PRESIDENT WILL BE CALLED "AIR FORCE ONE". CURRENTLY, HIS RIDE OF CHOICE IS A **BOEING VC-25**, ITSELF A CUSTOMISED FORM OF THE ALSO-ICONIC 747

SPIRIT OF ST. LOUIS

THE NAME OF THE PLANE THAT UNDERTOOK THE **FIRST SUCCESSFUL FLIGHT FROM NEW YORK TO PARIS IN 1927** IS JUSTIFIABLY FAMOUS. AS IS ITS PILOT, CHARLES LINDBERGH, WHO SAT IN A MINISCULE COCKPIT THAT HE COULDN'T EVEN SEE OUT OF FOR OVER 33 HOURS. **THE PLANE'S FUEL TANKS WERE LOCATED IN THE FRONT**, SO LINDBERGH WAS FORCED TO LOOK OUT THE SIDE WINDOWS OR A PERISCOPE



SIR DAVID GRAHAME DONALD

WHETHER IT'S TRUE OR NOT, THIS ROYAL AIR FORCE (RAF) PILOT SWORE THAT IN 1917, HE WAS DOING A LOOP-THE-LOOP WHEN, **AT THE TOP, HIS SEATBELT BROKE**. RAF PILOTS THEN WEREN'T ISSUED PARACHUTES, AS THEY WERE THOUGHT TO DAMPEN THE FIGHTING SPIRIT. HE PLUMMETED 600 METRES, WHICH "PASSED VERY QUICKLY AND TERRA FIRMA LOOKED DAMNABLY 'FIRMA.'" MIRACULOUSLY, HE **FELL BACK ONTO HIS SOPWITH CAMEL FIGHTER**, WRESTLED BACK CONTROL AND EXECUTED "AN UNUSUALLY GOOD LANDING"

WHEN AIR TRAVEL FIRST BECAME AVAILABLE TO THE PUBLIC, IT WAS A CHANCE FOR A LAYPERSON TO ENJOY A BIRD'S-EYE VIEW OF THE WORLD — AND WHO INDEED COULD RESIST THAT?



PHOTO: CORBIS



TECHNICIANS WORK ON THE JET TURBINES OF A LUFTHANSA PASSENGER PLANE DURING A REGULAR MAINTENANCE SESSION
RIGHT: THE AIRBUS A380 IS THE WORLD'S BIGGEST PASSENGER AIRLINER

PHOTOS: CORBIS (MAIN); NASA (STEVE FOSSETT)

of qualified pilots who had earned their stripes in the air force were available for work. Jets were quickly marshalled for commercial use, notably Britain's de Havilland Comet in 1952, and later the Boeing 707 and Douglas DC-8 from the United States. This new era of long-distance, pressurised, fast passenger aircraft would revolutionise the use of aircraft.

With jets making ever-greater speeds possible, the natural question was, just how fast could we go? And in the Cold War environment that followed World War II, with American and Russian technology in sharp competition, there was a need to find the answer quickly.

Regular *DCM* readers may recall our interview with retired United States Air Force brigadier general Chuck Yeager, more than 60 years after he broke the sound barrier over Muroc airfield (now Edwards Air Force Base) in 1947. Yeager did so with broken ribs, having fallen off a horse two nights before the record flight. In order to avoid telling anyone about his injuries, he used a piece of broomstick to wedge home the lock on the plane's hatch, before breaking the speed of sound for the first time. After Yeager, the future of the military aircraft was above the speed of sound.

Many thought that the supersonic age would transform passenger aircraft as it undoubtedly transformed the military. When passenger services on Concorde were launched in 1976, that seemed to be the case. British Airways and Air France flights across the Atlantic, at twice the speed of sound, were the epitome of

jet-setting. "There was arguably nothing quite as remarkable in the history of flight as a Concorde scheduled service," writes Grant, "It saw over 100 passengers — without flying suits or helmets — travelling 17.7 kilometres above the earth." They moved faster than a bullet, covering a mile (1.6 kilometres) every 2.7 seconds, without a ripple in their coffee.

Concorde was amazing right to the tip of its flexible nose cone — straight ahead for aerodynamics in-flight, drooping down for better visibility upon landing. But there were problems with taking supersonic travel much further. It could generally only take place over oceans, because of the disturbance caused on the ground by the sonic boom created by planes passing the speed of sound.

That's why Singapore Airlines, which operated code-shares with British Airways for flights via the Middle East, abandoned them; as first Malaysia and then India refused to allow the planes to go supersonic in their airspace. Concorde was also launched amidst an era of greater environmental concern, and straight into the oil crisis in the 1970s. And since Concorde was small, sleek and light — you could never carry any hand luggage on it as there were no cargo bins — it could hold only a limited amount of fuel, so crossing any oceans bar the Atlantic was impractical.

The Russians had a similar plane, the Tupolev Tu-144, but a crash of one of the jets at the 1973 Paris Air Show put buyers off, and the project was shelved after a short service

life. Boeing too abandoned further plans for an American supersonic jet, the 2707.

So Concorde was to remain an exception rather than the norm, while the rest of the general public continued to fly at a subsonic 805 kilometres an hour or so. Then when a Concorde crashed upon take-off from Paris in 2000, the writing was on the wall. Today, they have been retired — although you can still tour them in places including Manchester, in the United Kingdom, and Le Bourget, Paris.

05

THE JUMBO JET



Boeing has had a history of betting the farm on new aircraft. When it built the 707, it cost more to do so than Boeing itself was worth at the time. It bet big again with the 747 — the jumbo jet. "If the 747 had failed," writes Blatner, "Boeing would have gone out of business." He

ICONS OF FLIGHT

STEVE FOSSETT

IN 2002, FOSSETT BECAME THE FIRST TO SUCCESSFULLY COMPLETE A SOLO FLIGHT AROUND THE WORLD IN A 10-STORY-HIGH BALLOON. IT TOOK HIM SIX ATTEMPTS — ONE OF WHICH SAW HIM PLUMMET THE HEIGHT OF MOUNT EVEREST AND SPEND 23 HOURS IN A LIFE RAFT BEFORE RESCUE. AND HIS 2002 FLIGHT WAS NO PICNIC: IT TOOK ALMOST 15 DAYS IN A SPACE THE SIZE OF A CLOSET, SLEEPING AN AVERAGE OF THREE HOURS A DAY AND EATING MILITARY RATIONS



STUKA

THE JUNKERS JU-87 STURZKAMPFFLUGZEUG OR "STUKA" WAS A FEARSOME DIVE-BOMBER. ARMED WITH AIRBRAKES ALLOWING IT TO DIVE NEAR VERTICALLY BEFORE SLOWING, THE STUKA DELIVERED EXPLOSIVE PAYLOADS WITH NEAR-PINPOINT ACCURACY. ITS OTHER WEAPON WAS PSYCHOLOGICAL: ITS DISTINCTIVE SIREN LEFT PEOPLE WONDERING IF THE EAR-SPLITTING SHRIEK WAS THE LAST SOUND THEY WOULD HEAR



AIRPLANE FOOD

IN-FLIGHT MEALS HAVE A TERRIBLE REPUTATION, BUT IT MAY NOT BE ENTIRELY THE FOOD'S FAULT: AS CABIN HUMIDITY IS KEPT LOW TO REDUCE FUSELAGE CORROSION, WE CAN'T TASTE THINGS PROPERLY, AND CHANGING AIR PRESSURE NUMBS ABOUT ONE-THIRD OF OUR TASTE BUDS. TO FIX THIS, SOME CARRIERS BROUGHT IN RENOWNED CHEFS, LIKE GORDON RAMSAY, TO IMPROVE MEALS. BUDGET AIRLINES SIMPLY REMOVED THEM



says that Boeing could only build it with a commitment that airlines would buy it, and persuaded Pan American World Airways' (Pan Am) founder, Juan "Terry" Trippe, to agree to do so, provided Boeing promised it would be economical to fly as a cargo jet as well as a passenger one. "Neither Boeing nor Pan Am needed to be concerned: the 747 went on to become incredibly successful, and today it is perhaps the most recognised plane in the world."

Grant calls the jumbo "the last product of the visionary era of commercial aviation". It happened on an epic scale, with twice the passenger capacity of any existing jet airliner when the design process began. In the United States, a whole new factory, bigger in volume than any other building in the world, was built in Everett, north of Seattle, to construct it.

The jumbo made its maiden flight in 1969 and entered service in January 1970, by which time entranced airlines had already ordered 150. This, not supersonic travel, turned out to be the future — size and economy. "The message of the 747's success was that air travel was going to be mass travel," writes Grant. The jumbo was remarkable because with this new plane, airports changed too. Runways had to be longer to accommodate it. Air bridges were bigger, particularly for those that linked to the top deck.

The world became far smaller with the jumbo's considerable range. "Airports had to reinforce runways and expand passenger and baggage handling facilities, initially swamped by 300 or 400 people

disgoring at once from a single aircraft," Grant writes. "In-flight caterers had to adjust to supplying their fare in previously undreamed-of quantities. Hotels had to be built to cope with the rising tide of travellers."

There was nothing technologically significant about the jumbo, nor its competitors, the McDonnell Douglas DC-10, Lockheed TriStar, and new kid on the block Airbus Industrie's A300. But the jumbo was all about impact — and none more so than its biggest new arrivals.

06

SUPERSIZED, AND MORE SECURE



And so we return to the hangar in Toulouse, France, and the Airbus A380. Perhaps the most remarkable thing about assembling the world's largest passenger plane, capable of being configured for over 800 people (nobody has yet gone

above Air France's 538), is the speed with which it happens. From the components arriving in Toulouse, to conclusion of the assembly process, it takes just seven and a half working days — far less than it takes to be painted. This miracle is managed due to cooperation among numerous European manufacturers: the wings are made in Wales, composite materials like the tail section in Germany and Spain, and large parts of the fuselage in France.

An unforgettable sight comes when the biggest pieces — the wings, bits of fuselage, and tailspan — arrive by barge from Bordeaux, in Langon. They are then loaded onto huge vehicles, to be driven to Toulouse on small back roads through the countryside. In *Airbus A380: Superjumbo of the 21st century*, writer Guy Norris describes "a remarkable convoy that could have jumped straight from the pages of Jonathan Swift's *Gulliver's Travels* as it winds through the pastures, geese farms and vineyards of the Landes and Gers regions towards Toulouse."

As we sit in a mocked-up section of an A380 interior, a guide describes the interior configuration options available to airlines. There are endless variations of economy, premium economy, business and first class seats. In perhaps the boldest suggestion, Kingdom Holding, a Saudi enterprise owned by Prince Al-Waleed bin Talal, considered using an A380 as a private jet (though reports suggest he sold the plane prior to delivery). Airbus won't share details, but rumours abound of plans for an on-board garage

capable of holding limousines, and an internal lift.

Aside from the A380, and Boeing's versatile new rival, the 787 Dreamliner, other changes have been in the air too, not always for the better. Terrorist attacks and hijackings in the 1960s and '70s started to change our views of airline security, and by the 1970s, airports began developing onerous security procedures. And of course, the September 11, 2001 attacks led to greatly increased security procedures.

Meanwhile, as economy class flight and wholesale pricing structures made it easier for families to fly, airlines raced to wedge even more people onto each aircraft. Airlines like Laker and Dan-Air in the '70s and '80s, and their natural descendants easyJet, Ryanair and Air Asia, make flight more affordable, yet more joyless than ever. The age of the flying bus is upon us.

This is the future. Bigger planes, competitive fares, and more of us travelling more often — not always in greater comfort, but more efficiently. While unromantic, it works. "At the start of the new millennium, projections were for future air passenger traffic tripling in volume to four billion journeys a year by 2020," says Grant. There were constraints that might affect this expansion, he says, particularly the impact of aircraft on global warming.

"But this did not mean that any serious question mark hung over the future of mass air travel," he stresses. "A triumph of technology and organisation, it had given human beings an undreamed-of mobility — and it was here to stay." ●



AIRBUS A350 XWB

At press time, Airbus' highly anticipated A350 XWB aircraft was gearing up for its maiden flight, and had announced the six-man crew that will be on-board: two flight test pilots and four engineers who will evaluate the plane's first official flight. Similar to its competitor, the Boeing 787 Dreamliner, much of the A350 XWB's body is made of carbon-fibre composites, and Airbus says the plane also boasts "advanced aerodynamics". Combined with "next-generation" Trent XWB engines from Rolls-Royce, these elements are expected to reduce fuel burn by 25 percent.

PHOTOS: M. LINDNER/AIRBUS S.A.S. 2012 (MAIN); A. DOUMENOU/AIRBUS S.A.S. 2012 (PLANE ON RUNWAY)

AFTER BEING ASSEMBLED IN TOULOUSE, A380 AIRPLANES ARE SENT TO HAMBURG, GERMANY TO BE PAINTED

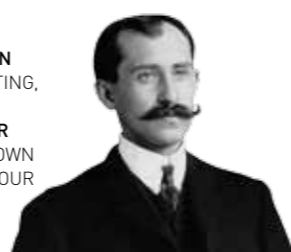
ICONS OF FLIGHT

WILBUR AND ORVILLE

WHETHER YOU BELIEVE THE WRIGHT BROTHERS WERE TRULY THE FIRST TO FLY (THERE ARE COMPETING CLAIMS), THEIR 12-SECOND, 36-METRE FLIGHT IN 1903 CAPTURED THE IMAGINATIONS OF MILLIONS. IRONICALLY, WEEKS BEFORE, *THE NEW YORK TIMES* INSISTED THAT **TO BUILD A FLYING MACHINE WOULD REQUIRE "THE COMBINED AND CONTINUOUS EFFORTS OF MATHEMATICIANS AND**



MECHANICIANS FROM ONE MILLION TO 10 MILLION YEARS". THE WRIGHT BROTHERS, IT'S WORTH NOTING, MADE SOME SILLY PREDICTIONS OF THEIR OWN. WILBUR ONCE DECLARED **NO PLANE WOULD EVER FLY FROM NEW YORK TO PARIS** BECAUSE "NO KNOWN MOTOR CAN RUN AT THE REQUISITE SPEED FOR FOUR DAYS WITHOUT STOPPING"



WONDER WOMAN'S INVISIBLE PLANE

WHY HASN'T REALITY CAUGHT UP WITH THIS SUPER-HEROINE'S AIRCRAFT, FIRST INTRODUCED IN THE EARLY 1940s? IT CAN REACH A TOP SPEED EIGHT TIMES FASTER THAN THE SPACE SHUTTLE, RESPONDS TO ITS PILOT'S THOUGHTS, CAN MORPH ITS SHAPE, AND PROVIDES OXYGEN FOR SPACE FLIGHT. PLUS, IT PROPELS ITSELF BY HARNESSING GRAVITON PARTICLES, AN ECO-FRIENDLY POWER SOURCE — NO NEED FOR FOSSIL FUELS HERE!



STEWARDESSES

OFFERING THE PROMISE OF INTERNATIONAL TRAVEL, BEING A FLIGHT STEWARDESS WAS A COVETED JOB IN THE EARLY DAYS OF GLOBE-SPANNING AIRLINES. IN 1935, AROUND 2,000 WOMEN APPLIED FOR 43 POSITIONS AT TRANSCONTINENTAL AND WESTERN AIRLINES. LOOKS WERE IMPORTANT. A 1966 CLASSIFIED AD FOR EASTERN AIRLINES REQUIRED STEWARDESSES TO BE **SINGLE, 20 YEARS OF AGE, AND HAVE A WEIGHT OF 47 TO 61 KILOGRAMS "IN PROPORTION TO HEIGHT"**