Air Power's Early Development in America and Italy

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The article looks at the early development of air power (pre-World War One) and considers why, although the United States pioneered the development of heavier-than-air aviation, it was the Italians who first applied the emerging technology to war. It considers how the vastly different geo-political situations in each country influenced each nation's approach to the aeroplane's use and how, in Italy, the new technology captured and defined the political and public imagination. The unique combination of technology, necessity and creative vision was focussed in Italian minds on the aeroplane's fragile frame. This harnessing of science and artistic vision made the difference and enabled Italy to provide the aeroplane with its first opportunity to demonstrate its potential as a weapon of war.

Introduction

Aerial warfare was foreseen by artists, poets and novelists such as Leonardo Da Vinci, Tennyson and Jules Verne long before the technology leading to powered flight was mature, and whilst today air power's military utility is undisputed, at the start of the twentieth century, the aeroplane's contribution to warfare was not an inevitable consequence of powered flight.[1] In the years immediately after the Wright Brothers' first successful flight at Kitty Hawk in December 1903, American inventors dominated the aeroplane's early development, rapidly improving the range, ceiling, speed, reliability and payload of this nascent technology.[2] Within five years, the aeroplane had improved sufficiently for American aviators to visit Europe and triumphantly demonstrate their technical supremacy. However, the first aviators were largely focussed on the aeroplane's practical development and were less concerned with its use as foreseen in the visionaries' flights of fantasy. Consequently, despite America's technological lead, the US was slow to exploit the aeroplane's military potential. The early European enthusiasts on the other hand, were able to ignore the technological constraints, and consider how the aeroplane's military potential could be exploited in that continent's less stable geopolitical environment. Thus, it was in Europe, and notably in Italy, that American technological progress first turned into the nightmares of writers and artists.

In Italy, Guilio Douhet was quick to advocate the use of the aeroplane as a weapon of war and, by 1911, Italy had fought the aeroplane's first war against the Ottoman Empire. In this short, but intense conflict, the Italians experimented with the majority of roles with which we associate air power today. It took the US until April 1917, when it entered the First World War, to forge its air power doctrine, which it did in the fires of that conflict.

This paper argues that the reasons why the US was slow to develop air power as a weapon of war compared to the Italians was both a function of the different geographic and political conditions, and a result of the different attitudes to the use of the technology. The paper starts by examining the development of aviation in North America before exploring the geopolitical and associated factors that influenced the development of air power doctrine in the US and Italy. In considering the Italian perspective, the paper looks at the social and political movements that made Italy such fertile ground for nurturing the idea of aerial warfare.

Development of American Aviation

American inventors pioneered heavier-than-air flight and led the aeroplane's early development but, by 6 April 1917 when the US joined the First World War, Hudson observes that it had no aviation units trained for war and no air officers in Washington who 'had ever seen a fighting plane'. Moreover, of the US Army's fifty-five training aircraft, General Pershing commented that 'fifty-one were obsolete and the other four were obsolescent'.[3] To suggest that this lack of preparedness reflected a lack of knowledge about

air power's utility would be wrong. As early as 1794, the French had used reconnaissance balloons for observing enemy troops in its war against Austria which, given the close links between France and the newly independent America, probably meant that this revolution in warfare was known to the US. By the mid-nineteenth century, air power had also been used offensively, by the Austrian Empire in the First Italian War of Independence. In 1849, unmanned balloons with time-fused bombs were despatched against Italian forces in Venice, although the mission failed when the wind changed direction and the balloons were blown back over Austrian lines. On the other side of the Atlantic by contrast, air power was not received with such enthusiasm. In 1840, during the Second Seminole War in Florida, part of the long-running American-Indian Wars, Colonel John Sherburne unsuccessfully sought to convince the War Department to use balloons for spotting Seminole campfires at night. Although the Secretary of War, Joel Poinsett seriously considered the idea, he was persuaded by a sceptical Army commander in the field that the terrain was not suitable for balloons and rejected the proposal.[4] Similarly, in 1846, John Wise failed to gain the War Department's approval to use balloons to bomb Vera-Cruz in Mexico during the US-Mexican War.

It was not until the start of the American Civil War in 1861 that the American military formally embraced aviation with the creation of a civilian Balloon Corps under the Union Army's Bureau of Topographical Engineers. The Balloon Corps, operating under Chief Aeronaut Thaddeus S Lowe, used tethered reconnaissance balloons to observe Confederate forces and direct artillery fire onto the enemy's positions using the newly developed telegraph system. Lowe also created the world's first aircraft carrier, the *George Washington Parke Curtis*, a converted coal barge, from which Union forces could launch, tow and recover reconnaissance balloons. At the same time, John LaMountain was, unofficially, invited by Major General Benjamin F Butler to use untethered balloons in support of the Union cause, and in July 1861 he made the first successful observation of Confederate forces. The use of balloons in this way, by both sides, had a physical as well as a psychological impact. Scarce troops were diverted from the front-line to deceive the aerial enemy by applying camouflage to positions and the creation of dummy encampments/gun emplacements, whilst commanders regularly changed their battle plans once they thought they had been observed.[5] The systematic use of air power during the Civil War attracted European attention, and Count Ferdinand von Zeppelin travelled to America to become a military observer for the Union Army.

Despite air power's positive contribution to the conduct of the American Civil War, however, balloons were withdrawn from the military inventory of both sides in 1863, two years before the War ended. On the Union side, the decision to phase the balloons out was taken amidst a background of rivalry between Lowe and LaMountain over technology sharing, changing financial priorities on both sides and the biases/interests of key military and civilian personalities

(all features that would hamper the development and early use of heavier-than-air flight).[6] When General McClellan, a supporter of the use of balloons, was relieved of his command of the Union Army early in 1863, the civilian Balloon Corps' funding was cut by Captain Cyrus Comstock, who had been appointed to oversee its activities. Inevitably, the reduced funding impacted onthe Corps' effectiveness and by August 1863, the Union's Balloon Corps was disbanded. The disbandment formed part of General Ulysses S Grant's reorganisation of the Union Army because, given the Union's vastly superior human and material resources and the unreliability of aerial observation, Grant preferred to conduct an attritional campaign to one that was intelligence-led.[7] The Confederate Army's abandonment of air power was more prosaic. Having always operated at a disadvantage in aviation terms, and with its technological and resource disadvantage, it had only managed to muster two balloons during the War. By the summer of 1863, both had been captured and the Confederacy lacked the resources to replace them. Balloons were not reintroduced to the US inventory until 1891 when a military Balloon Section was formally established within the Army's Signal Corps.[8]

The organisational inertia that had delayed the formation of the Balloon Section did not stop the US War Department secretly providing Professor Samuel Langley of the Smithsonian Institute with $50,000 in 1898 to produce a flying machine. Unfortunately, Langley's tests ended in failure when he crashed into the Potomac River in 1903, attracting widespread press condemnation and public ridicule that created a Departmental mistrust of aeroplanes lasting years. Moreover, this crash was merely the first in a series of very public disasters that undermined official enthusiasm for the aeroplane in the early years of US military heavier-than-air aviation. Worried about the crash's impact on Congressional funding for their other projects, the War Department decided to withdraw support for aviation and refocused on more pressing (and more conventional) issues like modernising the army's field artillery. The political fall-out of Langley's crash affected the government's confidence in aeroplanes to such an extent that a 1904 report by Howard Taft, then Secretary of State for War, contained no mention of aircraft at all, even though the Chief of the Signal Corps (and thus *de facto* Head of US Army Aviation) was singled out for his commendable foresight and energy in other respects.[9]

The American attitude to flying oscillated between hostility and ambivalence for many years. When an officer from the Royal Aircraft Factory at Aldershot sought to buy aeroplanes from the Wright Brothers in January 1905, the Brothers approached the US War Department and offered them the first purchase of the Wright Flyer. The suggestion was met with apathy, even though the Wright's aeroplane had a range of over 3 miles and had achieved speeds of 35 miles per hour. It was to take another three years for the US to overcome its mistrust and buy its first aeroplane.

In 1907, the US realised that it was falling behind military aviation's

rapid progress elsewhere and, galvanised by President Roosevelt's interest in the subject, the US Army's Board of Ordnance sent an officer to Europe to shadow European developments. By 1908, some parts of the American establishment had recognised the aeroplane's potential and the Secretary of State for War predicted that the aeroplane would 'profoundly affect modern warfare'.[10] In the same year, the Signal Corps bought its first powered aircraft to add to the three balloons already in its inventory and created an Aviation Force of three officers and ten enlisted personnel.[11]

Officialdom's lukewarm enthusiasm for aviation cooled further when Lieutenant Thomas Selfridge was killed on 17 September 1908 in the world's first fatal aeroplane accident at Fort Myer, Virginia. The incident, which occurred during acceptance trials in front of 2000 spectators, had unpleasant overtones of Professor Langley's failed 1903 experiments and prompted fears of further the public/media ridicule. These two very public failures made politicians fearful of the political consequences of another expensive aviation humiliation and undermined whatever Congressional support there was; Congress refused to approve the aeroplane's purchase in that year's appropriation, or indeed fund aviation at all in 1909/10 (it probably did not help that the Signal Corps could not specify an operational requirement for the purchase). By 1911, therefore, whilst the Italians were preparing to fight against the Ottoman Empire in Africa - the aeroplanes' first conflict - the US Army still had only one aeroplane and one pilot in service.[12]

Despite official hesitancy over the aeroplane's prospects, an enthusiastic group of US Army and US Navy officers was exploring air power's potential for war. In the Navy, Captain Washington Irving Chambers USN became the first American officer responsible for naval aviation and in 1910-11 he organised experimental flights from ships and established the first permanent naval flying base at Annapolis, Maryland.[13] In the Army, the Signal Corps was trying to pioneer the development of military aviation under Major General George Owen Squier, but still faced considerable institutional reluctance towards its attempts to embrace the new technology. Despite this hesitancy, US aviators were still experimenting with the aeroplanes' military utility. Lieutenant Thomas de Witt Milling tested an aerial bombsight in 1911 and the following year, he and Captain Charles de Forest Chandler first fired a Lewis gun from an aeroplane.[14] However, the aeroplanes' practical developments were largely pursued by junior officers, who lacked experience of doctrine writing and were thus unable to formalise their experience or influence their conservative institutions to the same extent that Douhet did with the Italians.[15] The fact that American military aviation developed within the Signal Corps almost certainly influenced its early conception and, even in March 1914 when the Army Field Service Regulations included aviation in its guidance for combined arms warfare, the aeroplane remained limited to an observation role.[16] Despite small pockets of openness to the possibilities of the new technology, therefore, the

development of US military aviation remained slow and manifestly failed to match the aeroplane's rapid technological progress.

The first operational deployment of US Army aviators occurred in February 1913 when a small force (organised as the 1st Aero Squadron) was sent to Texas to work in support of the US Army's 2nd Infantry Division during another period of tension with Mexico. Ironically, Mexico had spent more on aviation in 1913 alone ($400,000) than the US had in the previous six years and, by early 1914, the US had only six airworthy aeroplanes and fourteen pilots.[17] By August 1914, the US could field eight serviceable aircraft from the thirty it had purchased to that date: of the twenty-two no longer in service, one was in the Smithsonian Museum and the others had been destroyed in accidents or condemned.

Deeply dissatisfied with the state of US military aviation compared to that of Europe, a Congressional inquiry was launched into the Signal Corps' handling of military aviation that was to move US aviation forward. The 1913 Congressional Inquiry into 'Aeronautics in the Army' by the House of Representatives Committee on Military Affairs, followed the 1912 Presidential elections that brought President Woodrow Wilson to office and gave a progressive Democratic Party control of both Houses of Congress. Wilson and his Party favoured policies of neutrality and isolation and opposed the idea of large standing armies, which they saw as more likely to provoke war. Against this political backdrop, the aeroplane must have seemed an attractive way of providing for US defence without the cost and risk associated with maintaining large numbers of troops against a relatively remote threat. Moreover, the Inquiry followed shortly after the Italo-Turkish War, and the US had access to translated versions of the Italian General Staff Reports into the War.[18] Despite this, only Captain 'Billy' Mitchell, Captain Beck and Mr Scott spoke convincingly of the aeroplane's offensive capability.[19] The Inquiry led to an "Act to Increase the Efficiency of the Aviation Service" that received Presidential approval on 18 July 1914.[20] The Act formalised the creation of an Aviation Section within the Signal Corps, meaning it could no longer be abolished by the Branch Head and, amongst other things, introduced the concept of flying pay for its aviators.

Notwithstanding the official recognition underlying the formation of the Aviation Section, the aeroplane had still not won the battle for wholesale acceptance. As late as December 1914, the Head of the Signal Corps testified to the House of Representative Military Affairs Committee that 'as a fighting machine the airplane has not justified its existence'[21] despite the fact that he was the Army's aviation champion and had received favourable reports from Major Squire, one of his own officers in Europe. Squire, the American military attaché in London, reported that

'for strategical and tactical reconnaissance's the aeroplane is at present simply indispensable. In the present form of trench warfare the aeroplane is used to watch, sketch and plot the development of the enemy's trenches by day, and in most cases it is the only method of

keeping informed of the day to day progress of their preparations.' [22]

Further evidence of official reluctance to commit to the aeroplane was evident the following year when the Chief Signal Officer's appropriation request for $1,000,000 in 1915/16 was reduced to $300,000 by the Secretary of State for War before being further cut to $250,000 by Congress – yet even this was twice that of the previous year's budget.[23]

The Signal Corps continued to use what aeroplanes it had and, in 1916, the Aviation Section was deployed to Vera Cruz in the hunt for Pancho Villa. A squadron of eight aeroplanes supported the mission, but their fragility was ruthlessly exposed when, after six weeks, all the Squadron's equipment was consumed or destroyed. By the time the US joined the First World War in April 1917, it was still a long way behind the Europeans in the application of heavier-than-air aviation to war; aircraft played an insignificant role in US mobilisation plans, with little funding and almost no air power doctrine. The extent of the underfunding was clearly revealed by the fact that in May and June 1917, Congress appropriated over $54m for aviation,[24] rising by the end of the year to $640m for aircraft manufacture and the expansion of the Aviation Section.[25] The lack of funding was only matched by the paucity of American thinking on the application of air power, so that three days before the US declared war, the National Advisory Committee for Aeronautics (the forerunner to NASA) sent a telegram to all aircraft manufacturers asking "Can you provide training reconnaissance airplanes? If so, state type …". As Holley observes, this 'effectively left the determination of aeroplane types to industry'.[26]

America's aviation pioneers and early industrialists were predominantly practical men who, although pushing the bounds of the technology, were also its servants because they could not outrun that which they were seeking to create. As pragmatists, concerned not only with technical issues but with staying alive - one quarter of early US fliers were killed in aircraft crashes - they perhaps were less able to see air power's full potential than the Italian fantasists who brought a vision unconstrained by technology's limitations.[27] Tellingly perhaps, the US Army saw the dirigible's proven technology as more useful for warfare long after European visionaries had switched allegiance to the aeroplane as having greater potential.[28] However, whilst these factors clearly influenced the early development of US aviation, the primary reason why the US was slower than the Italians in developing military air power can be found in the different geopolitical circumstances.

Geopolitical Situation

At the turn of the twentieth century, Italian and US geopolitical circumstances were vastly different. America was the pre-eminent regional power and was increasingly seen as a world power, whilst Italy was a fragile state, vulnerable to attack from more powerful neighbours against whom it could do little.[29] Moreover, Italy was surviving in a continent in which the balance of power was precarious: at the turn of the twentieth century, and in a reversal of Kagan's famous assessment of the two continent's

modern natures,[30] the Europeans came from Mars whilst the Americans were from Venus, at least in relation to US relations with the world beyond their own 'near abroad'.[31]

The United States

Having isolated itself (and much of Latin America) from the rest of world behind the walls erected by the Monroe Doctrine in 1823, the US was somewhat remote from global politics. Its land borders were secure in the south thanks to its overwhelming strength over Mexico and the defeat of the Spanish in the 1898 Spanish-American War, whilst the American-Canadian frontier was protected through agreements with Great Britain.[32] Simultaneously, US sea borders and trade interests were protected by a powerful navy, built around Admiral Mahan's belief (borrowed from John Evelyn) that 'whoever commands the oceans … commands the world'.[33] Consequently, whilst aircraft lacked the range to cross the Atlantic or Pacific Oceans, the US had little to fear from its enemies. Living in a secure geopolitical space and safe from attack, America did not suffer from the same nationalistic and militaristic pressures that were rife in a Europe whose nation states lived in a constant state of existential angst. This lack of a credible threat and political isolation meant that the US was also relatively isolated intellectually and thus had little knowledge of European air warfare.[34] Conversely, European states watched each other closely, ever alert to the development of new ideas that might impact on their security. Something as radically new and potentially threatening as aviation was unlikely to remain the preserve of any one state for long. Air power's technology and doctrine (such as it was), therefore, rapidly spread throughout Europe as states invested in aviation to avoid being outpaced by potential enemies.

Threat-free, the Americans tended to view international relations through a liberal/idealistic lens in which the world was ordered through pacific mechanisms.[35] The 1899 Hague Conferences on the conduct of war saw the US try to minimise the military use of aerial devices by proposing a five-year prohibition on the 'discharge of projectiles or explosives from balloons or by other means of a similar nature'.[36] Given the immature state of the technology of the day, European states supported this but, by the 1907 Hague Conventions, the security situation in Europe had worsened and aeroplanes had become more capable of being used as weapons. Most European powers now rejected the American attempt to renew the prohibition on aerial bombing but, whilst the US remained isolated and threat-free, it had no strategic imperative for developing, funding or even debating the utility of military aviation.

The lack of government funding for aviation limited industrial interest and American aeronauts were forced to generate enthusiasm, sales and thus income by performing at public airshows. This elevated American civilian aviation priorities to a much higher level than was the case in Europe. For a country as large as the US, aeroplanes promised more rapid communication than land travel, even the railways, and the US National Advisory Committee on Aeronautics

initially looked to aviation as part of a domestic airmail service rather than as a means of warfare. In contrast, the relative open-handedness of European governments towards aviation - by 1914, the Italian Government had spent more than eight times that of the US on aviation - encouraged American aviators to cross the Atlantic to sell their aircraft, spreading the technology and fuelling the growth of European aircraft manufacture. The importance of a strategic imperative as a generative force for military aviation's early growth was clearly shown once America became embroiled in the First World War; having entered the war, the US developed its military aviation doctrine with as much ingenuity as its engineers had developed the aeroplanes themselves in the preceding fourteen years.

Italy

In late nineteenth century Europe, the balance of power was precarious. The agreements ending the Franco-Prussian War had created modern Italy and Germany in 1871, which generated an atmosphere of instability in which states were under constant threat. This sense of danger was particularly acute for the Italians and prompted them to join the Triple Alliance with Germany and Austria in the hope of preventing invasion from her most dangerous neighbours. Italy had been vulnerable to invasion through the Alps for centuries; Napoleon called them Italy's 'splendid traitors' because they provided a less effective protective border than the topography might at first suggest. Armies heading south into Italy enjoyed easier invasion routes thanks to the more gentle northern slopes and a semi-circular shape that made invasion paths converge near Turin ready for the attack. Italian forces had a more difficult passage and would be dispersed by the mountains and valleys on the northern side before reaching their objective.[37] Jorge Chavez Darnell's crossing of the Alps by aeroplane on 23 September 1910, therefore, overcame Italy's topography inequality and offered the prospect that she might deter or attack her neighbours on an equal footing. Indeed, Douhet makes explicit reference to the advantage of air power in freeing the State from the confines of its geography in his writings from 1910 onwards.

Italy was intensely nationalistic by the start of the twentieth century, a sense made more acute by the damage suffered to her prestige through the loss of Tunisia and Algeria to the French and her failure to seize Ethiopia in 1896.[38] Industrially backward compared to other European nations, Italy had a relatively small population of less than 35 million, of whom over 50% were employed on the land and lacked the skills needed to support the large-scale industrialisation necessary to reverse Italy's economic fortunes. Moreover, deep societal inequalities meant that Italy was riven with class-hatred and was susceptible to popular mass revolt along the lines predicted by Karl Marx.[39] In this regard Douhet's early advocacy of aerial bombing of civilian populations as a means of inciting revolution amongst one's enemies can probably be seen, in part, as an awareness of Italy's own vulnerability to class revolt at this time.

That Italy had a maritime tradition is

also significant; land powers typically think in terms of contiguous zones of occupation and control around central points, whilst sea powers conceive of controlling points and connecting lines of communication.[40] Air power's inherent mobility but lack of persistence conceptually made it closer to seapower, which may explain why, within the European context, it was Italy, rather than land-power Germany, that pioneered air power's application to war.

Italian Attitudes to Aviation

With US and Italian geopolitical positions differing markedly, so too did official attitudes to technology. Whereas the US War Department was (excessively) cautious about the aeroplane, new ideas and technology were welcomed in Europe, and particularly in Italy, where the aeroplane offered many the hope that the country's recent humiliations could be overcome. This general enthusiasm was reflected in the generous allocation of funds from both government and public: in 1910 the Italian Government allocated ten million Lire for aviation, enabling Caproni to produce the first indigenous Italian aircraft in his factories,[41] whilst a public appeal in 1912 raised three million Lire in public gifts and subscriptions to purchase aeroplanes for the Army.[42]

The Italian Futurist Movement capitalised on the populist mood, arguing that Italy's greatness could be recaptured by the wholesale acceptance of new technology that would lead to the radical transformation of society. The reverence for technology was encapsulated in Marinetti's 1909 'Futurist Manifesto', in which he wrote passionately about the love of danger and the beauty of speed:

> '1. *We want to sing the love of danger, the habit of energy and rashness.*
>
> 2. *The essential elements of our poetry will be courage, audacity and revolt.*
>
> 3. *...*
>
> 4. *We declare that the splendour of the world has been enriched by a new beauty: the beauty of speed. A racing automobile with its bonnet adorned with great tubes like serpents with explosive breath ... a roaring motor car which seems to run on machine-gun fire, is more beautiful than the Victory of Samothrace.*
>
> 5. *We want to sing the man at the wheel, the ideal axis of which crosses the earth, itself hurled along its orbit.*'[43]

The aeroplane was an especially powerful totemic symbol in Futurist thinking, because it offered to lift man - literally and figuratively - above nature and give life to Icarus' dream.[44] Its significance was such that later, in the 1920s and 1930s, the aeroplane gave rise to a uniquely Italian art form – Aeropainting - which reflected the Fascist period's obsession with this machine. Ironically, however, despite claiming to look forward to a new age of Italian greatness, Futurism's (and latterly Fascism's) lauding of individual heroism and chivalry was strongly reminiscent of the medieval era and Chaucer's *parfait knight*, with aeroplane nose-art in World War One resembling the markings on a medieval knight's shield.[45] The sense

of chivalry and heroism that formed around the Italian aviators in the Libyan War promoted a mystique that was only dispelled by the Italian Air Force's poor performance in World War Two.[46]

The Italian fascination with technology, however, was not confined to a populist and artistic movement, but was intimately connected with Italian politics through individuals like d'Annunzio who had both a passion for technology and close political links with the Socialist and right-wing parties.[47] Mussolini, who learned to fly in 1919, enthusiastically embraced the idea of technology as the path by which Italy could reach its destiny and, after the First World War, embedded a reverence for technology within his Fascist Party's manifesto. Like Nietzche's 'superman', therefore, aviators became heroic figures; an aristocratic elite that would lead Italy back to greatness. Mussolini's vision echoed Douhet's own hero mythology of 'uncertain machines struggling in the wind, guided by steady hands, as if made of bronze, and hearts steadier than bronze. Man and his machine with one strong pulsation in one single heart; a single tangle of nerves and steel shrouds'. The narrative similarities, however, are perhaps unsurprisingly given Mussolini's and Douhet's mutual friendship and shared political beliefs.[48]

Crucially, however, technology was not valued for its own sake but was inextricably linked with battle. This vision glorified militarism and patriotism, but most especially war, as the Futurist Manifesto made clear.

'7. *Beauty exists only in struggle. There is no masterpiece that has not an aggressive character. Poetry must be a violent assault on the forces of the unknown, to force them to bow before man.*

8. *…*

9. *We want to glorify war - the only cure for the world - militarism, patriotism, the destructive gesture of the anarchists, the beautiful ideas which kill, and contempt for woman.*

10. *...*

11. *We will sing of the great crowds agitated by work, pleasure and revolt; the multi-coloured and polyphonic surf of revolutions in modern capitals: the nocturnal vibration of the arsenals and the workshops beneath their violent electric moons: … and the gliding flight of aeroplanes whose propeller sounds like the flapping of a flag and the applause of enthusiasticcrowds.*
It is in Italy that we are issuing this manifesto of ruinous and incendiary violence, by which we today are founding Futurism, because we want to deliver Italy from its gangrene of professors, archaeologists, tourist guides and antiquaries.'[49]

The enthusiastic embrace of Darwinian and Malthusian ideas, where war was not merely positive but generative, made Italy the perfect environment in which to combine air power and warfare. At a time that writers like H.G.Wells were writing fictional accounts of aerial warfare in his 1909 '*War in the Air*' (which was also the title of the official history of British Military aviation in World War One), and the Americans restricted aeroplanes to reconnaissance and

support duties, Douhet published *'The Problems of Air Navigation'*. Far from being a technical report on navigation, the paper provided a coherent military treatise for the conduct of aerial warfare.[50] Crucially, however, Douhet's military and scientific background was combined with a creative streak as an amateur novelist, poet, painter and playwright, hence he was able to indulge in flights of fancy without being constrained by the rigid technical or doctrinal orthodoxy of the day.[51] His ability to harness emerging (if immature) technology with a vision of the future of warfare enabled him to see the need and argue for the mechanisation of the Italian Army in 1902, and recognise as early as 1910 that 'the skies are about to become a battlefield as important as the land or the sea'.[52] According to Segrè, it was this ability to create a compelling vision of the future, which he likens to that of an 'Old Testament' prophet, that represents the Douhet's greatest contribution to air power rather than any claims that Douhet was an air power strategist in the Clausewitzian mould.[53]

It did not take long to put Douhet's new ideas about aerial warfare into practice. When Italy declared war against the Ottoman Empire in Tripolitania, Fezzan and Cyrenaica in September 1911, it despatched a small force comprising aerostats, dirigibles and the First Aeroplane Flotilla, with nine machines, mainly monoplanes, and eleven pilots.[54] In October 1911, Italy became the first State to use aeroplanes, alongside airships, in reconnaissance and on 1 November it used its aeroplanes in direct combat tasks by attacking troops on the ground when Lieutenant Guilio Gavotti bombed Turkish positions at Ain Zara and Tagiura.[55] By the end of the war, aircraft had also been used in psychological operations (leaflet dropping) and photographic reconnaissance tasks. The Official Report of the War noted that, whilst the bombing 'did no material damage', its 'moral effect' was significant and claimed the Italian pioneering experiment in air power's military potential as 'a treasure for the future'.[56] Keen to capitalise on air power's potential, the Italian Staff appointed Douhet to command the Aviation Battalion in Turin in 1912. Douhet enthusiastically pressed the case for aviation and wrote a new publication entitled *'Rules of the Use of the Aeroplane in War'*, but perhaps pressed his case too energetically and was removed from post at the end of 1914 for ordering aircraft from his friend Caproni without authority.[57]

The enthusiasm for aeroplanes that inspired Douhet and the Futurists, however, was not universal and, just as in America, officialdom was sceptical. The Italians had been particularly pleased with the performance of their dirigibles in the Libyan War and Colonel Maurizio Moris, who had been Head of the Aviation Inspectorate in 1908 and had offered to buy aeroplanes from the Wright Brothers, still favoured the airship's proven technology. Even as late as 1914, 75% of Italian aviation funding was allocated to airships.[58] Despite this, the aeroplane's potential was recognised, and Italian expenditure on aeroplanes still dwarfed that of America; by 1914 Italy had four times more aircraft in its inventory than the US. Shortly after Italy joined the First World War in June 1915, Douhet advocated

air power as the most promising route to victory, criticising the Italian military and urging the creation of a 500 bomber aircraft armada to strike at the Central Powers. His criticisms, and somewhat cavalier approach to the chain of command, made him numerous enemies within the Italian military and, when he left some classified (and highly critical) documents on a train, he was sentenced by court-martial to one year's detention.

Douhet continued to lobby for an Allied air offensive from his cell, arguing that the priorities should be to win command of the air by bombing aerodromes and aircraft manufacturing before attacking the enemy's rear. His emphasis on the deep battle and the use of what is essentially counter-battery fires in his advocacy of attacks against enemy aerodromes to the rear of the battlespace hinted at his background as an Artillery Officer, which can be contrasted with the images of military aviation developed by supporting arms, such as the US Signal Corps. Douhet also urged the creation of an independent air force to control this new weapon in a memorandum of 3 July 1917 co-signed with d'Annunzio and Caproni.[59] The Italian Army's disastrous defeat at Caporetto - it suffered over 30,000 casualties and 265,000 captured - confirmed Douhet's critical predictions carelessly left on the train and, when he was released from detention shortly afterwards, Douhet was appointed as the Central Director of Aviation and the General Air Commissariat.[60]

The Italian lead in applying air power to warfare did not last long as other nations forged their own military aviation doctrine in the heat of the First World War's battles. By 1917 the American Bolling Aeronautical Commission visited Europe to learn from the Allied experience and recommended buying Italian biplanes after Major Edgar Gorrell visited Caproni's factory. Gorrell left Europe with more than aeroplanes, however, and was armed with Major Lord Tiverton's plans for strategic bombing that heavily influenced the development of early US air power thinking.[61] With equipment from France, Britain and Italy, and help from European air power theorists, notably those of Italy and Britain, the US quickly developed its own doctrine through the Bolling Commission and innovative thinkers like 'Billy' Mitchell, so that by 1926 Douhet was citing American military air power approvingly in the second edition of his seminal text, *'The Command of the Air'*.[62]

Conclusion

From the Wright Brothers first successful flight in December 1903, aviation's early development was dominated by the Americans, but the US was slow to imagine the aeroplane's military impact. In contrast, and with a very different geo-political situation, Italy rapidly embraced the aeroplane's potential and developed approaches for applying air power to war.

By the twentieth century, the US was a secure nation, free from external threats and following an isolationist policy that separated it from European influence. America was also a growing economic power that viewed its navy as the primary means

of protecting its security and trade interests. Italy on the other hand was a fragile state, threatened by powerful neighbours and constrained by geography. She was in decline and had lost her status as a great European power. Believing that Italy's destiny lay in industrialisation, the Futurist movement, with its influence on Italian fascism, captured the Italian *zeitgeist* in which war and technology were glorified. Italy's popular and political culture thus enabled innovation to flourish and the aeroplane, the pre-eminent symbol of modernity, synthesised the fascination for both technology and war. This combination ineluctably encouraged Italian thinkers to apply the new American technology to modern warfare so that, by 1911, Italy had become the first nation to use air power in combat and had grown, in Douhet, the first generation of air power visionaries and theorists. What, therefore, is clear from the early development of air power is that the effective exploitation of technology depended, and still depends on an imperative for action and a willingness to embrace both pragmatists and visionaries within the organisation: C.P. Snow's nexus of the two (scientific and intellectual/artistic) cultures.[63] In the US, therefore, the pragmatic scientific approach saw the aeroplane's limitations, whilst the Italian romantic approach (bolstered by a compelling geo-political situation) saw it's potential. An air force or nation, therefore, that fails to make space for both scientific and artistic groups, and denies a place to dissenters who can challenge technological or doctrinal orthodoxy, prejudices its chances of maximising its operational relevance.

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Notes

[1] C. Builder. *The Icarus Syndrome. The Role of Air Power in the Evolution and Fate of the US Air Force* (Santa Monica CA: RAND/Transaction Publishers, 2003) at 41.

[2] The United States' Aeronautical Annuals of the late nineteenth and early twentieth centuries were comprised largely of articles by European writers, even though the Annual's heavier-than-air flying records were dominated by American aeronauts until Blériot's 1909 crossing of the English Channel - see J. Means ed. *Epitome of the Aeronautical Almanac* (Boston MA: W.B. Clarke Company, 1910).

[3] J. Hudson. *Hostile Skies. A Combat History of the American Air Service in World War I* (Syracuse NY: Syracuse University Press, 1968) at 2-3.

[4] M. Schene. 'Ballooning in the Second Seminole War', 55(4) *Florida Historical Society*, 1977 at 481.

[5] 'Balloons in the American Civil War' at **http://www.centennialofflight.gov/essay/Lighter_than_air/Civil_War_balloons/LTA5.htm** (last accessed 25 January 2010).

[6] The bitter dispute between the Wright Brothers and the Curtiss Aeroplane Company in the early twentieth century is, in many respects, reminiscent of the nineteenth century feud between Lowe and LaMountain during the Civil War.

[7] 'Balloons in the American Civil War', *op.cit.*

[8] J. Cooke. *The US Air Service in the Great War* (Westport CT: Praeger, 1996) at 5.

[9] I. Holley. *Ideas and Weapons. Exploitation of the Aerial Weapon by the United States During World War One* (New Haven CT: Yale University Press, 1953) at 25.

[10] Holley, *Ideas and Weapons* at 27.

[11] The Aviation Force was created as a purely administrative action within the Signal Corps. As an 'unofficial' body that could be disbanded without reference to the US government, the Aviation Force was poorly placed to obtain funding or defend itself against other Army units seeking support. See Holley, *Ideas and Weapons* at 27.

[12] J. Buckley. *Air Power in the Age of Total War* (London: Routledge, 1999) at 36.
[13] C. Gross. 'George Owen Squier and the Origins of American Military Aviation', 54(3) *Journal of Military History* at 281-2.
[14] R. Futrell. *Ideas, Concepts, Doctrines. Basic Thinking in the United States Air Force 1907-1960* (Maxwell AL: Air University Press, 1971) Vol. One, at 16.
[15] Builder, *The Icarus Syndrome* at 43.
[16] Futrell, *Ideas, Concepts, Doctrine* at 17.
[17] Compared to France's 260 aircraft and 171 pilots, Great Britain's 29 aircraft/88 pilots and Italy's 26 aircraft/39 pilots. See Holley, *Ideas and Weapons* at 29. Between 1908 and 1913 it is estimated that the US spent $435,000 compared to France's $22 million – Gross, 'Origins of American Military Aviation' at 287.
[18] *The Italo-Turkish War (1911-12). Translated and Compiled from the Report of the Italian General Staff by 1st Lt R Tittoni USMC.* (Kansas City, MO: Franklin Hudson, 1914). The Reports were actually translated in July 1913.
[19] M. Maurer ed. *The US Air Service in World War One* (Washington DC: US Government Printing Office, 1978) Vol. II at 8-17.
[20] Maurer, *The US Air Service in World War One* at 1.
[21] Quoted in Holley, *Ideas and Weapons* at 31.
[22] Quoted in Cooke, *The US Air Service in the Great War 1917-1919* at 7.
[23] Maurer, *The US Air Service in World War One* at 1.
[24] Hudson, *Hostile Skies* at 4.
[25] Futrell, *Ideas, Concepts, Doctrine* at 19.
[26] Holley, *Ideas and Weapons* at 40.
[27] Builder, *The Icarus Syndrome* at 42.
[28] Futrell, *Ideas, Concepts*, Doctrine at 16.
[29] T. Ropp. *War in the Modern World* (Baltimore MD: John Hopkins Press, 2000) at 291.
[30] R. Kagan. *Paradise and Power. American and Europe in the New World Order* (London: Atlantic Books, 2003).
[31] America was not a pacifist nation within its own borders and fought for almost 300 years against the native American population. The American-Indian Wars lasted until the Battle of Bear Valley (Southern Arizona) on 9 January 1918, in which E Troop of the US 10th Cavalry fought with a band of Indians from the Yaqui Tribe (see 'Buffalo Soldiers at Huachuca', 2 *Huachuca Illustrated* 1996 at **http://www.gwpda.org/comment/huachuca/HI2-05.htm**). During the intermittent wars, which included savage fighting on both sides, the American military developed a considerable expertise in counter-insurgency warfare, but, the notion of fighting 'small' wars (itself a politically-charged and derogatory term), did not find favour with the US Army, which favoured a classical European (Napoleonic) style of state on state warfare in which decisive battles could be fought and won (J. Nagl. *Learning to Eat Soup with a Knife* (Chicago: Chicago University Press, 2005) at 44-45). By being institutionally focused on inter-state warfare, the US Army was less well equipped to identify and deal with the nature of the conflict in Vietnam than the US Marine Corps who's vision encompassed its role as a 'colonial' army. See the ARPA Report. *Bureaucracy Does Its Thing: Institutional Constraints on US-GVN Performance in Vietnam.* R-967-ARPA. (Santa Monica, CA: RAND, 1972).
[32] The 1817 Rush-Baghot Agreement secured the Great Lakes and the 1871 Washington Treaty demilitarised the US-Canadian land borders.
[33] J. Haslam (2002). *No Virtue Like*

Necessity. Realist Thought in International Relations since Machiavelli (New Haven CT: Yale University Press, 2002) at 172.
[34] T. Davis Biddle. *'Rhetoric and Reality in Air Warfare'.* (Oxford: Princeton University Press, 2002) at 49-50.
[35] This is perhaps typified by President Woodrow Wilson's plans for the League of Nations at the end of the First World War.
[36] Declaration IV, I signed at The Hague on 28 July 1899.
[37] N. Spykman. 'Geography and Foreign Policy II', XXXII The American Political Science Review, 1935 at 235.
[38] F. Hinsley. *Power and the Pursuit of Peace* (Cambridge: Cambridge University Press, 1967) at 263.
[39] R. Hamilton & H. Helwig eds. *The Origins of World War One* (Cambridge: Cambridge University Press, 2003) at 358.
[40] Spykman. 'Geography and Foreign Policy' at 224.
[41] Buckley, *Air Power in the Age of Total War* at 37.
[42] J. Stokesbury. *A Short History of Air power* (London: Robert Hale, 1986) at 21.
[43] F. Marinetti. *The Futurist Manifesto* (1909) at **http://www.cscs.umich.edu/~crshalizi/T4PM/futurist-manifesto.html** (last accessed 27 November 2009).
[44] A. Gat. *A History of Military Thought* (Oxford: Oxford University Press, 2001) at 563-566. The section 'Futurism, Proto-Fascist Italian Culture, and the Sources of Douhetism' provides an excellent overview of the political and artistic background to the development of early Italian air power thinking.
[45] S. Poleskie. 'Art and Flight', 18 *Leonardo*, 1985 at 72.
[46] M. Paris. 'The First Air Wars – North Africa and the Balkans 1911-1913', 26(1) *Journal of Contemporary History* 1991 at 100.
[47] However, it should be noted that limited opposition to Marinetti's vision existed amongst the section of the population that remained deeply conservative (and Catholic) and who were either unsure of, or aghast at, the extremely anti-traditional (and militantly atheistic) stance of the Futurists.
[48] Gat, *A History of Military Thought* at 575.
[49] Online. Marinetti, *Fascist Manifesto*.
[50] Gat, *A History of Military Thought* at 573.
[51] Gat, *A History of Military Thought* at 571.
[52] Quoted in P. Meilinger ed. *The Paths of Heaven. The Evolution of Air power Theory* (Maxwell AL: Air University Press, 1998) at 2.
[53] C. Segrè. 'Giulio Douhet: Strategist, Theorist, Prophet?', 15(3) *Journal of Strategic Studies*, 1992 at 360.
[54] Paris, 'The First Air Wars', at 98.
[55] A Harvey. 'Bombing and the Air War on the Italian Front, 1915-1918', 47(3) *Air Power History*, 2000 at 36.
[56] *The Italo-Turkish War (1911-12)* at 100 & 135. British War Office estimates placed the number of Turkish casualties from airship attacks as 26 killed and 70 wounded between March and June 1912 – see *Notes on Employment of Military Dirigibles in the Libyan War*, March 1914, Air 1/576/625, PRO cited in Paris, 'The First Air Wars' at 100.
[57] Gat, *A History of Military Thought* at 574.
[58] Meilinger, *The Paths of Heaven* at 2. Airships continued to play a part in Italian aviation, including postal services, into the 1930s, but a spate of airship tragedies, such as those of the *Hindenburg*, R101 and Airship

Italia, and the aeroplanes' maturing technology relegated their importance over time.

[59] Gat, *A History of Military Thought* at 579. At the same time, General Smuts was preparing his report for the British Government on 'Air Organisation and the Direction of Aerial Operations' that called for the creation of an independent air arm in Britain. Smuts' Report was published on 17 August 1917.

[60] Meilinger, *The Paths of Heaven* at 6.

[61] Davis Biddle, *Rhetoric and Reality in Air Warfare*, at 54.

[62] G. Douhet. *The Command of the Air*. trans. D. Ferrari (London: Faber and Faber, 1927) at 25.

[63] C.P. Snow. *The Two Cultures and the Scientific Revolution. The Rede Lectures.* (Cambridge: Cambridge University Press, 1959).