THE AIR DEFENCE OF GREAT BRITAIN: AN OVERVIEW, 1920-1936

By Dr David Jordan

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Abstract: In the aftermath of the First World War the RAF's dedicated home defence force capability dwindled to almost nothing. In an era of post-war financial austerity and the lack of any extant threat, air defence seemed an unlikely area for investment, yet it was carefully developed throughout the interwar period. This article outlines the reconstitution of air defence capability and the developments which provided the United Kingdom with the most effective air defence system in the world by 1939. Highlighting the work in this area of John Ferris, John Alexander and others, the paper argues that air defence was a constant feature of British air power, and that victory in the Battle of Britain in 1940 lay in the ongoing development of air defence capability during the inter-War period.

INTRODUCTION

On 20 January 1920, Number 203 Squadron of the Royal Air Force (RAF) disbanded, with little fanfare. Yet this was a significant moment in that it meant that there was not a single air force squadron in the United Kingdom tasked with air defence.[1] Although this capability gap was brief, it was a notable nadir for the air defence of the UK. While it is fair to say that the capability offered by 203 Squadron's Sopwith Camels was relatively limited, since any attacking force would have outnumbered it, the Camel was still able to intercept most extant bomber types. The reason that such a step could be taken was because there was no immediately obvious threat to the United Kingdom from aerial attack, making the disbandment less of an alarming characteristic than it might first appear. The only bomber force within range was that of France, Britain's erstwhile ally in the First World War, and it would have been stretching credulity to think that in the opening months of 1920 there was any reasonable prospect of a French bombing campaign against the United Kingdom.

The RAF's primary task during the 1920s and early 1930s was to support low intensity operations in the British Empire and Mandated Territories, notably Iraq and Afghanistan. With the exception of the aforementioned French bomber force, there was no obvious threat of air attack from a major European opponent with the will and ability to strike against the British mainland in any strength. While possible threats could be posited, these were more theoretical than real. Germany, which had conducted attacks throughout the First World War, was crippled by the Versailles settlement; Russia was too far away for any aircraft then extant to strike Britain, even had the Bolshevik government had the means or the will to do so in the midst of a bitter civil war post-revolution; while the limitations of aircraft technology meant that most other European nations were similarly unable to carry out an air attack against the British mainland (and this again presupposed some unlikely *casus belli* which would prompt a desire to conduct such an operation). The only threat – that of attack by what we would now term a 'non-state actor' – was implausible, even though there is evidence to suggest that Irish republican leaders contemplated the possibility of an air raid against London had negotiations over Irish independence gone awry in 1922.[2] All of this was set against a backdrop of financial austerity in the aftermath of the war. Yet despite this apparent lack of threat, the 1920s were marked by a debate over the value of air defence within the broader context of defending the homeland against air attack. As this short article seeks to highlight, the government of the day concluded that although there was no obvious threat, it was sensible to ensure that a level of air defence capability was maintained, upon which any future expansion of the home defence force might be based. The appreciation that to abandon air defence entirely left Britain, and particularly London, vulnerable to a future threat led to deliberate steps to regenerate the capability that had been all but lost in the 24 months following the Armistice of 1918. The reason for this was articulated clearly by the man who had established the first integrated air defence network – albeit it a limited one protecting London – Major General EB Ashmore:

> In the months after the Armistice the question: "can there be another war?" had but one answer. By 1923 the Everlasting No [sic] had taken on a far less confident tone.[3]

Although the British public was not eager to see increased defence spending at a time of austerity, there was a clear feeling within the country that there was a risk of air attack. Where such an attack might come from was far from clear, but the experiences of the First World War, with the nation under bombardment from both airship and fixed-wing aircraft, meant that it was difficult for the government to be complacent about air defence, even if the strategic situation in the early 1920s meant that it was difficult for the advocates of robust air defences to point confidently in the direction of a possible future threat. Over the course of the next decade, aviation was regarded with a mixture of adoration and dread as the public thrilled to various record attempts made by both military and civilian aviators and digested an array of earnest literature, often in the form of rather poorly thought out pulp fiction which built upon the nascent fear of air attack, but also including more serious analyses of the possible threat which came from recognised military figures whose credibility was not in question. This created an environment in which the air defence of the nation could not be overlooked by the government even if it wished to do so. In fact, despite the infamous – and oft-misunderstood – 'Ten Year Rule', the RAF had not fared badly in relation to the other services when it came to defence spending during the period.[4] It is, in fact, arguable that the RAF suffered more from the decision in 1932 to abandon the Ten Year Rule which 'had greatly benefited it by concentrating resources on mechanical devices over manpower.'[5]

The often-overlooked concerns of the electorate are all-too often combined with a disregard for the actual security considerations of British governments during the inter-war era and a failure to fully comprehend the actual doctrinal position of the RAF with regard to air defence. To compound this problem, the manner in which the air defences of Great Britain moved from their nadir in 1920 through to being able to fight and win the Battle of Britain in the summer and early autumn of 1940 is not helped by historical accounts which attempt to suggest that all this was achieved by a mixture of military mavericks (notably in the shape of Air Chief Marshal Sir Hugh Dowding Air Officer Commanding in Chief (AOC-in-C) of RAF Fighter Command 1936-1940) and prescient civilians (particularly in the form of Sir Robert Watson-Watt, the 'father' of radar and Sir Thomas Inskip, the Minister for the Coordination of Defence) overcoming the dogmatic obsession with strategic bombing held by a monolithic Air Staff.[6] In fact, there was considerable debate within the RAF as to the efficacy of defence against air attack, and the view that held that defence was possible actually gained the upper hand very early on in the period under consideration. Thought about air power was not monolithic in the RAF, but because of the dominance of Marshal of the Royal Air Force Viscount Trenchard in the historiography of the early years of the Service and his firm views on the lack of

utility of defensive activity, an assumption that RAF policy was robustly 'Trenchardian' has developed. In fact, the way in which Trenchard ran the Air Force meant that a wide pool of senior leaders had influence and the means to 'out-vote' their Chief on policy and doctrine. Air Defence was perhaps the most obvious area where this occurred. Despite Trenchard's protests that having anything more than a token fighter force (to assuage public fears) was a waste of effort and an improper use of air power, he was unable to prevent the RAF from adopting a course which saw air defence developed during the 1920s and 1930s. The cumbersomely named Air Defence of Great Britain (ADGB; sounding more like a separate body than an integral part of the RAF) arose from the ashes of 1920, and took forward air defence until its replacement in 1936 with Fighter Command. ADGB has been seriously underestimated by most historical accounts, yet John Ferris goes so far as to suggest that by 1934, 'British air defence was the best on earth', a case he robustly supports in his writing.[7] Ferris also makes one critical point which has gone unregarded for too long in the consideration of the supposed mothballing and regeneration of the air defence capability: in fact, air defence was comparatively well resourced throughout the interwar period.[8]

To understand the air defence of Great Britain in the interwar period it is necessary to appreciate that in the teeth of doctrinal debate over the best use of an air force (and in the early part of the 1920s whether one should exist at all), the Air Staff, supported by the government, was willing to expend time, effort, money and intellectual capital in engaging in the maintenance, and where finances permitted, expansion of an element of air power which was designed to address a putative future war. This maintained a clear focus upon the fundamental principle of maintaining security for the home base. When the time came in 1940 for this to be tested, the investment in an area which might be seen as an unlikely repository for funding over the course of the period 1919-1934 paid off handsomely. That is not to say that the air defence system was a 'golden child' of the Air Force, doted upon while other areas had to make do with a meagre proportion of the austere amount of money granted to the RAF in the interwar period – relative fiscal restraint was still the order of the day; the point is that carefully targeted investment and keeping the capability in touch with developments by maintaining a cadre of skills amongst a relatively small force (which would have been hard pressed to defend much of southern England beyond the environs of London) enabled prompt development and, when needed, expansion so that many of the difficulties that would have inevitably arisen had the RAF been forced to start from scratch were avoided. There was, for example, little confusion over the need for an effective command and control (C2) system, or debate over what this should look like, since a C2 system was already in place to be built upon.

First, it was necessary to work on the presumption that although the immediate threat might not be obvious, the generation of a possible security challenge must not be discounted. Second, practical projections of likely near and medium-term threats were

required, grounded in an appreciation of the technologies which might underpin the threat and an effective response to it. Such considerations demanded careful thought and the use of intelligence – which was not always forthcoming in the period discussed here – to arrive at sound conclusions as to how to configure air defences. This, in turn, demanded a third key factor, namely flexibility of thought and an ability and willingness to make relatively swift changes in procurement and force structure planning.

Fourth, all of this required money. This may appear to be a rather glib and obvious assertion, but in the straitened circumstances of the 1920s and 1930s, where the economic picture was rarely rosy, and where the three armed services fought with some vigour over the apportionment of government spending for defence, this was more complicated than might be imagined. The government was eager to avoid spending any more than it thought was reasonable on defence during this period, in part meeting the poor economic conditions and partly to accord with the clearly expressed opposition of the electorate to anything which might be seen as notable rearmament of the country with the concomitant risk of rearmament increasing the likelihood of another European war. Yet in spite of all this, the Air Staff, the government and various civilian advisors from the scientific community were able to develop the air defence network of which Ferris speaks so approvingly.

REBUILDING CAPABILITY: CONTEXT AND DEBATES

Although air defence capability in terms of fighter aircraft reached its nadir in January 1920, the RAF was not without an air defence capability for very long. On 26 April, Number 25 Squadron reformed at Hawkinge in Kent.[9] It was equipped with Sopwith Snipes, a move which pointed to the economies underpinning defence at the time. A development of the famed Sopwith Camel, the Snipe had been ordered in reasonably large quantities prior to the Armistice, and there were some 500 airframes in storage.[10] The Snipe was, arguably, not the best aircraft available for the air force, since the now-forgotten Martinsyde F4 'Buzzard' was faster, more powerful and may have been better suited to the air defence role than the Snipe.[11] Unfortunately for Martinsyde, their aircraft was at a slightly earlier stage of development, and not available in any numbers at the time of the Armistice – there were only around 50 airframes on charge with the RAF at that point – and this sealed the type's fate. Martinsyde ended up buying back the airframes in RAF service and then selling them (along with several hundred airframes which had not been fully completed in 1918, but finished subsequently as a private venture) to a few European air arms who, at least one historian would argue, ended up with better fighter aircraft than the RAF as a result.[12] This marked a point of the RAF being forced to make the best of what was available rather than what might have been procured, even at relatively little extra cost. Perhaps indicative of the rather odd manner in which air defence was regarded in 1920, 203 Squadron had reformed in March, again with Sopwith Camels (because they were available), albeit with the primary duty of cooperating with the fleet, rather than protecting the UK from possible air attack.[13]

This state of affairs did not last long. A requirement for a Snipe replacement had been issued in 1918, and as it became clear that there was a need to maintain some form of military aircraft production in Britain, with manufacturers being starved of orders, this specification (the Type 1 S.S. [Single Seat] Fighter) was allowed to continue. The chosen design, the Nieuport Nighthawk, was not particularly successful. Only 63 aircraft reached the RAF, and then only to form a single squadron, overseas, in 1923.[14] Number 25 Squadron soldiered on with its Snipes until changing political circumstances meant that the air defence of Great Britain became a notable political consideration again in 1922. Although Britain and France had been closely allied during the First World War, by 1922, their relationship had become more fractious. The French attitude towards German reparations was a notable source of tension, and some siren voices suggested that there might be a threat to the United Kingdom from the French Air Force, which was notably larger than the RAF.

Brett Holman has analysed a variety of air scares and panics in Britain which dated from before the First World War, and notes that the presence of Germany as the main danger was a constant theme, even in 1922. While the French Air Force's 220 squadrons of aircraft were frequently referred to as presenting the sort of threat that Britain might face, this was more in the manner of an indication of what was possible, rather than likely.[15] The *Daily Mail* noted with concern that there were twice as many civilian aircraft in Germany than in Britain, with the implication being that this was a possible threat: after all, the Allied Commission on Air Questions had made an observation in 1919 that civilian aircraft could be turned into war machines with relatively little effort.[16] This was not news to British airmen, many of whom could recall the Bristol Scout, a racing aircraft turned early fighter reconnaissance aircraft, as but one example of this from the First World War. The manner in which the ease of turning civilian types into bomber aircraft helped to scupper disarmament conferences in the 1930s and the fact that a number of the *Luftwaffe's* bomber types in the Second World War had begun life under the guise of fast aircraft for delivering post and cargo demonstrated the validity of this point, even if the *Mail's* threat assessment was perhaps a little too pessimistic in 1922.

A series of articles in *The Times* in 1922 (later published in book form) by Brigadier-General PRC Groves gave clear public articulation of the potential threat, while concern over the possible French threat was played out largely in Whitehall without media attention.[17] Groves could not be dismissed as a mere pessimistic crank, since he had been the British Air Representative to the peace conferences in 1919, and had gone on to serve on the body tasked with monitoring German compliance with the Terms of the Versailles settlement.[18] While the Germans had followed the demand to rid themselves of fighter aircraft, Groves had been unable to avoid the conclusion that there was something amiss with the proliferation of civilian types, and had decided that certain types of transport aircraft could readily be converted into bombers.[19] Groves' concern

was taken up by a number of newspapers, and was a theme which made a number of reappearances in the British press during the 1920s and 1930s. The publication of Basil Liddell Hart's book *Paris, or the Future of War* in 1925, and its respectable sales figures meant that a significant minority of the public was presented an apocalyptic vision of air attack. Once more, coming from someone with recognised credentials as a military commentator, this did nothing to remove the thought of air attack against Britain from the public conscience, even if it would be a gross overstatement to suggest that the 'man on the Clapham Omnibus' thought about the threat on a regular basis.[20] It would be equally fallacious to suggest that public concern translated into political panic and a hurried resurgence in air defence. Not only was political concern about the potential threat measured, by the time that Liddell Hart's work had appeared, steps to improve Britain's air defences had already been taken.

The disparity in strength between the French Air Force and the RAF had been noted in British political and military circles in 1921, and from the autumn of that year, this had begun to have an influence on defence planning as well as wider diplomatic considerations.[21] This came at a propitious time for the RAF. In January 1921, there had been an upsurge in comments from senior officials and politicians to the effect that the RAF might be an extravagance, unless it could demonstrate a clear ability to fulfil some of the functions of the army and navy, and in a more economical fashion.[22] This, in turn, prompted Trenchard, as Chief of the Air Staff, to set out a clear role for the RAF which would be more economical than the other two services. This created considerable ill-feeling within the Army and Royal Navy, not least because by the autumn of 1921, Trenchard's rhetoric had reached notable heights. He made clear his view that civilian morale was the key factor in any future war, and that this could be influenced directly by bombing, rather than the 'old-fashioned' and sanguinary methods of blockade and fighting the enemy's army which had been seen between 1914 and 1918.[23] This coincided with a notable decline in relations with France. By the end of 1921, France appeared to be a serious threat to British interests. There was a further confluence of events which benefitted the RAF's air defence structures when as part of the planning process for the Washington Arms Conference, the government became painfully aware of just how great a difference there was between French and British air strength. Arthur Balfour, Lord President of the Council and an elder statesman of the Conservative Party (and thus a key figure in the Lloyd George coalition government) stated that he was filled with alarm at the fact that the French could stage an 'aerial invasion' without much interference from the RAF. He claimed that Britain was 'more defenceless than it has ever been before,' giving Trenchard the ideal opportunity to press his claims for the air force.[24] Efforts at obtaining a diplomatic settlement over Anglo-French differences came to naught, and in early 1922, the threat of the French 'Air Menace' led to firm consideration as to how this might best be addressed, even if the prospect of an actual war between the two countries seemed to be rather unlikely, even allowing for the poor relationship between them.

As a result of these concerns, the Committee of Imperial Defence established the Continental Air Menace Sub-Committee, which reported on 26 April 1922. The sub-committee report included a paper by the Air Staff which concluded that Britain was at risk of near-certain destruction from air attack if robust air defence measures were not put in place. The sub-committee accepted this contention with a caveat that it neither agreed nor disagreed with it, but noted that there was no actual experience upon which to quantify such alarming suggestions.[25] The Air Staff also argued that defence was best achieved through the mechanism of 'a vigorous offensive'.[26] This was entirely in keeping with the thoughts first expressed by Trenchard in his memorandum 'Future Policy in the Air' in September 1916, in which the then General Officer Commanding of the Royal Flying Corps in France had given clear articulation of his view that the aircraft was not a weapon of defence, not least since the amount of airspace to be defended meant that it was almost impossible to prevent enemy aircraft from crossing the front line.[27] Trenchard had made much of the 'moral' effect of air power during the First World War, and his thoughts on the matter had changed little, even if his views on exercising air power through an independent service which concentrated upon bombing were substantially different from his negative and pessimistic views during the last year of the war.[28] Trenchard felt that home defence would be best achieved by a force almost entirely made up of bombers, with a few token fighter aircraft thrown into the mix to assuage the concerns of the public; he had, after all, been fully aware of the feelings of soldiers who could not see friendly aircraft overhead during battles on the Western Front, and therefore felt that it was important to at least do something, even if nothing more than a token gesture, to ensure that the less robust civilian population did not feel as though it was utterly undefended.[29] It was here, however, that Trenchard was to find himself out of kilter with his subordinates, some of whom held rather less bomber-centric views. This was not of immediate importance, though, since deliberations over the best response to the threat continued.

In July 1922, the Committee of Imperial Defence, building upon the sub-committee report, concluded that the threat of air attack merited the creation of a home defence air force, a decision endorsed by Prime Minister Lloyd George the following month.[30] It appeared that these steps were timely when Anglo-French relations sank yet further with the Chanak crisis, and then in January 1923, British political opinion was horrified at the French decision to occupy the Rhur in response to the strike that had broken out there in protest at the ruinous nature of reparations. This was very much a last-ditch move by the French, but the shock that it caused in London was considerable. In February 1923, with a new government in Britain following the collapse of the Lloyd George coalition, the Air Ministry presented its recommendations for the Home Defence Air Force (HDAF). The recommendation was sent on to the National and Imperial Defence Subcommittee of the Committee for Imperial Defence, far better known by the name of its chairman, Lord Salisbury.[31]

The Salisbury Committee accepted the view put forward most vocally by Trenchard that bombing was likely to decide any future war, and thus recommended that it was essential

for the creation of the Home Defence Air Force (HDAF) to protect the nation against air attack. The HDAF was to be 52 squadrons strong, and, as might have been expected from a service led by Trenchard, when discussions over the structure of the HDAF were complete, the emphasis was placed upon bomber aircraft. This, though, is misleading. Trenchard felt that effective air defence was simply impossible, and that the value of home defence fighters and anti-aircraft guns was little more than a waste of resource, albeit with value for the maintenance of morale. He found that his view was not universally accepted.

A number of RAF officers felt that Trenchard undersold the importance of air defence, perhaps influenced by his experience of the Western Front and lack of contact with the air defence organisation which had emerged during the latter part of the war. The most prominent dissident was perhaps Air Commodore TCR Higgins. Higgins had commanded the RFC and then RAF home defence effort in the United Kingdom from February 1917, seeing the force grow from a wing through to a full brigade. He noted, quite reasonably, that the home defence forces had been extremely efficient once they had been given sufficient resources to combat the threat. This had been further enabled by the creation of the London Air Defence Area (LADA) under Major General EB Ashmore in 1917, which created the means whereby the careful blending of a nascent C2 network with which to direct air defence had blunted the German day bomber threat. When the German air effort had moved to night attacks, similar pain had been inflicted on the enemy raiders after only a short period of adjustment to intercepting fixed wing aircraft at night.[32]

Regarded as being amongst the RAF's primary experts on air defence, Higgins' views carried some weight. He was further supported by the Air Officer Commanding (AOC) India, Air Commodore John Chamier, whose war record invested him with considerable credibility and the respect of his peers, even if his background was in Army Cooperation. Chamier had commanded the Wireless and Observation School, and prior to his appointment as AOC India, he had served in the Directorate of Operations and Intelligence.[33] This meant that he was more than equipped to support Higgins' view that the use of radio-telephony to allow communication between ground stations and aircraft, and enabling the provision of timely information about incoming raids would permit defending aircraft to intercept approaching bombers and to destroy them. They had further support from the Air Member for Supply and Research, Air Vice-Marshal Geoffrey Salmond, who opined that the developments in radio-telephony meant that it ought to be possible to concentrate defending forces at a particular location in a manner that was simply not possible during the First World War.[34]

Despite the profound misgivings of the Chief of the Air Staff, the outcome of the planning led to a proposed force structure for the 52-squadron HDAF of 17 fighter squadrons and 35 bomber units. The bomber units were to include squadrons from the soon to be formed Auxiliary Air Force and the RAF Special Reserve, which meant that the

achievement of the full bomber strength of the 52-squadron force would be somewhat slower, given the time required to form and then train reserve units from scratch; in fact, the 52-squadron force was never completed, the plan being superseded by expansion programmes from the mid-1930s.

IMPLEMENTATION

Once the decision to create a HDAF had been announced in parliament on 26 June 1923, the task of creating a meaningful air defence capability had to begin.[35] This required expansion of the number of fighter squadrons to meet the desired targets, and as noted above, this was able to progress at a swifter rate than was to be the case with bomber aircraft. There was, however, a difficulty, in that the development of the fighter force was just as constrained by finances as was the bomber element of the HDAF – thus the increase in force size was relatively slow. The Sopwith Snipe, the design of which had begun six years previously – an extremely long time by the standards of the day – remained at the forefront of the HDAF, although it was clear that improvements were needed. This prompted an upsurge in fighter development, leading to improved types such as the Armstrong Whitworth Siskin and Hawker Grebe in the near-term, followed by types such as the Bristol Bulldog and Hawker Fury in due course. The developments in fighter types and the relatively rapid turnover of types in use for the home defence role (squadrons in the empire still soldiered on with First World War types such as the Bristol Fighter and DH.9A) stemmed from the realisation that the increasing speeds of aircraft meant that the need to be able to launch interception sorties and to climb to height became paramount. While the Snipe could reach a height of 10,000 feet in just over 10½ minutes, the Siskin III, which appeared in 1925, could reach 5,000 feet higher in the same time. The Bulldog, of 1929 vintage, was able to reach 20,000 feet in 14½ minutes, while the Fury Mark I could reach this altitude in what was then the astonishing time of fractionally over 7½ minutes.[36] While the capability of the fighter aircraft increased, their numbers rose rather less impressively, and it was clear that without a proper system of gaining information about incoming raids, improvements in aircraft performance were not the only answer.

This factor is of note when considering the implications of maintaining capability in a time of financial restraint – although the need for advanced equipment was clear, the RAF's success lay in working out how best to use that equipment and creating the means by which tactics and procedures appropriate to the latest threat could be adopted fairly swiftly. The use of communications technology served as a force multiplier, while the structures that were created to provide a basic level of air defence were managed in such a way that when the time came for expansion, they could be built upon. The RAF, in conjunction with the War Office (which had responsibility for anti-aircraft guns, barrage balloons and searchlights) invested much intellectual capital when financial capital was less readily available. This involved close co-operation between the services and a willingness to draw upon advice from civilians – particularly scientists – where

A Sopwith Snipe fighter pictured at Hendon.

Armstrong Whitworth Siskin IIIAs of 41 Squadron based at RAF Northolt c. 1928/29.

appropriate. Relations with aircraft manufacturing firms were at worst kept cordial; it is perhaps notable how many aircraft specifications of the time were realistic and able to be met in a timely fashion. Finally, the RAF adopted what might now be considered a 'cross-governmental approach', creating a system which could be used by other government departments to allow a prompt response in the aftermath of air attack on the United Kingdom.

The first case of expenditure of intellectual capital might be said to have come in the run up to the creation of the HDAF, with what became known as the Steel-Bartholomew Committee. This was the shorthand title for what was officially called the Joint Air Ministry and War Office Committee on Anti-Aircraft Defence, established in July 1922 under the leadership of Air Commodore John Steel, the Deputy Chief of the Air Staff and Director of Operations and Intelligence, and Colonel William Bartholomew, the War Office representative. The Committee's report recommended the creation of a prepared Aircraft Fighting Zone (AFZ), divided into sectors each with a fighter squadron, (plus one fighter squadron in reserve). This zone would be equipped with searchlights to permit night interception, while an Outer Artillery Zone along the edge of the AFZ would contain anti-aircraft guns which as well as seeking to bring down enemy bombers (known from the First World War to be a difficult task), would help to disrupt bomber formations, making individual aircraft easier targets for the defending fighters as they lost the mutual protection that formation flying provided.[37] Steel and Bartholomew noted that they could not provide the sort of protection that was perhaps hoped for within the financial constraints of the time; a number of key coastal areas such as Portsmouth, Dover and the Thames estuary were not provided with any aircraft defences, and had to rely entirely upon anti-aircraft guns for their protection.[38] Steel and Bartholomew thus laid down important parameters for air defence, even if they were rather constrained in what they could recommend – their solution provided a degree of protection for London, but the remainder of the UK, including important industrial areas in the Midlands and the North could not be provided for. Although this was not a major concern at the time, given the inability of most military aircraft to reach that far into Britain, the potential risks were not ignored; in something of an echo of today's situation, the air defence of the nation was, to an extent, taken 'at risk' because of the relatively low threat level.[39] This was exacerbated by a general reduction in tension in Europe in 1925, with the signature of the Locarno Treaties, which encouraged the government to slow down the development of the HDAF.[40] Nonetheless, Steel and Bartholomew laid the foundations upon which ADGB was able to build when it took responsibility for the HDAF upon its formation under Air Marshal Sir John Salmond in 1925.

In addition to the creation of a structure which could readily be adapted (as occurred with the reorientation of the system in the mid-1930s to meet the growing threat from Germany), the investment of thought and analysis into the problems of air defence brought further dividends.[41] It had been understood since the days of the LADA in the

A Bristol Bulldog IIa biplane of 17 Squadron pictured in 1930.

A formation of 1 Squadron Hawker Fury fighters.

First World War that one of the most important difficulties faced by the defending air force was to get its aircraft airborne and into the vicinity of the enemy bombing formations as quickly as possible. In the days before radar, this was extremely difficult, but it is instructive to note that LADA was capable of receiving information about an incoming raid (from observers and signal intelligence) within a minute of a report's origination, and to have fighters airborne no more than five minutes later.[42] LADA thus provided a foundation upon which ADGB's capabilities might be built, and was instrumental in planning between 1923 and 1924. A coordinated network drawing in information was developed and refined, thus enabling the Aircraft Fighting Zone squadrons to take off as quickly as possible; the effects being demonstrated in a number of air defence exercises during the period. The wisdom of having an effective C2 system was further illustrated by another intellectual investment during the period, namely in the form of the Romer Committee (after Major General CF Romer, the chairman), another joint enterprise between the War Office and the Air Ministry. Romer recommended the creation of observer posts which would cover all the country south of a line drawn from the Bristol Channel to the Humber. The 18 observer groups which controlled the individual posts were provided with a means of communication to their own Observer Centre, which in turn had direct links to the headquarters of ADGB. In addition, those observer stations which were close to fighter sectors in the AFZ had links direct to the sector headquarters, reducing the time taken for information to reach the body responsible for 'scrambling' the aircraft.[43]

Although these developments naturally required financial investment to realise, it is not unfair to say that for a relatively limited amount of expenditure (for instance, £500,000 in 1923-24), an effective, if limited capability was maintained.[44] Because careful thought and study went into the planning, even the limited, 'at risk' capability held some degree of credibility, and – more importantly – was not likely to head off down blind alleys should the need for expansion come. This is not to say that the process was error free: the RAF's decision to adopt the 'vic' formation proved erroneous, as did the decision to embark upon production of the Boulton Paul Defiant turret fighter. The key point, though, is that both of these decisions were made after a careful analysis of the available evidence. Only after combat was joined in 1940 did it become clear that the 'vic' was inappropriate for operations where enemy fighters were likely to be encountered, and the Defiant's rationale – the concentration of a heavy weight of machine gun fire by flights of the aircraft, picking off unescorted enemy bombers in turn was undermined by the German occupation of France, which meant that the Defiant's concept of operations was no longer valid.[45] Overall, then, the process of thinking about air defence in a detailed and meaningful way, the relative lack of funds notwithstanding, made a difference.

The RAF in fact took this a stage further. Close relationships with the scientific community evolved during the 1920s and 1930s. Improvements in interception technology were brought forward; for instance the creation of sound mirrors (to magnify the noise of

An early production Boulton Paul Defiant two-seat fighter aircraft.

approaching aircraft formations, thus giving some early warning) which employed scientific investigation to determine the best size and shape of these devices, which – for all their limitations – were considered to be 'fundamental to the scheme of defence' as early as 1926.[46] The mirrors in fact performed with variable results, but in the air defence exercises of 1934, they located every raid sent against areas they defended – the problem lay in the fact that the range at which the incoming raids were detected varied considerably, and in those cases where the raid was in close proximity to the sound mirror, the difficulties in scrambling defending fighters were considerable.[47] It was in part concern over the varied efficacy of the sound mirrors which encouraged the scientific community (at the behest of the Air Ministry) into considering alternative means of detection – leading, ultimately, to the creation of radar.

TOWARDS 1939

By 1934-35, the air defences of Great Britain had expanded but slowly. Of the 52-Squadron defence force, only 42 squadrons of fighters and bombers were extant by the end of 1933.[48] Nevertheless, although this critical capability had been maintained with a low level of funding, the RAF had been able to mitigate many of the problems faced. Failure to succumb to the temptation of investing the majority of money and effort into fighting 'the war' (or, more specifically, supporting a whole series of colonial policing actions) and to concentrate upon an area which would be of importance in a major conflict – no matter how unlikely this seemed at the outset of the process –

enabled the development of an effective set of foundations upon which Fighter Command was to be built from 1936.

The willingness to invest in intellectual activity, drawing together civilian and military personnel to properly analyse the challenges, drawing upon a mixture of experience and reasoned judgement about the likely threat over a relatively limited future timescale further enhanced the efficacy of ADGB. This should not disguise the fact that possessing equipment mattered – the evolution of ADGB's capabilities would have been hindered without the willingness to procure fighter aircraft that were sufficiently advanced enough to meet any likely threat. This point is perhaps reinforced by occasional scares that the RAF's fighter force was simply not fast enough to catch incoming bombers, as when Number 12 Squadron's Fairey Fox bombers outpaced defending fighters, and then again in the 1930s when the Hawker Hart bomber and then the Bristol 142 light transport had a maximum speed equal or greater than that of most of the fighter force. In the latter instance, the scare came when the RAF was, in many ways, ahead of the game, since planning for the introduction of the aircraft which became the Hawker Hurricane and Supermarine Spitfire was underway (and the Bristol 142, when developed into the Bristol Blenheim bomber, proved hideously vulnerable to fighters). All of these factors enabled the creation of Fighter Command in 1936. While there were inevitable teething problems for the new command, it was able to develop a world-beating capability by 1940, using

Spitfire IAs of 610 Squadron, Biggin Hill, 24 July 1940.

an effective reporting and C2 network to direct a well-equipped force of fighters to defend the nation against air attack. Further developments of the system were required to match the rise of night bombing, but by 1944 and the so-called 'Little Blitz', Fighter Command was able to inflict serious losses on German raiders.[49]

FINAL THOUGHTS

As John Alexander has sagely observed, AJP Taylor's allegation that Britain's air defence was 'despised and neglected' during the interwar period simply cannot be sustained.[50] In fact, as he demonstrates, (and adding to the work of John Ferris on the subject), Britain's interwar air defences were given careful thought and attention, even when there was little in the way of an obvious threat. Planning and preparation, not derision and neglect were the hallmarks of interwar air defence, upon which the success of the Battle of Britain was based. As Ferris has suggested, funding for defence was never quite as parlous as is popularly assumed and particularly not for the air force, but this should not obscure the fact that this was an era of fiscal restraint and – until the obvious threat of Germany emerged in the mid 1930s – one in which lavish spending on armaments was not politically acceptable. Within this construct, the willingness of the RAF to maintain sufficient skill sets and capabilities to operate a force which could be expanded if the threat changed (as it did in 1934-35), and which had the necessary infrastructure underpinning it was impressive. Although we are now 100 years into the history of the RAF, it is striking that it is only relatively recently that understanding of the air defence efforts of the service prior to 1939 has begun to emerge. It is also notable that the historiography of air defence after the Battle of Britain remains rather patchy, and it seems not unfair to suggest that while Taylor's characterisation is inaccurate, historians have certainly neglected the subject of Britain's air defence. Given that it was the question of air defence that gave rise to the Smuts Report and the formation of the RAF, this is ironic – and perhaps the sign that the area is ripe for further study and research, so as to fill the gaps in our knowledge about this vital constant in the RAF's history.

NOTES

[1] CG Jefford, *RAF Squadrons: A Comprehensive Record of the Movement and Equipment of all RAF Squadrons and their Antecedents since 1912*, 2nd edition (Marlborough: Crowood Press, 2001), p. 70.
[2] Michael O'Malley, Military Aviation in Ireland 1921-1945 (unpublished PhD Thesis, University of Maynooth 2007), pp. 21-24.
[3] Major General E B Ashmore, *Air Defence* (London: Longmans, 1929), p. 131.
[4] See John Ferris, *The Evolution of British Strategic Policy 1919-1926* (London: Palgrave, 1988) for a full examination of this issue.
[5] Neil Young, 'British Home Air Defence Planning in the 1920s', *Journal of Strategic Studies*, Volume 11:4 (1988), p. 492; NC Fleming, 'Cabinet Government, British Imperial Security and the World Disarmament Conference, 1932-1934', in *War in History*, Vol 18:1 (2011), p. 72.

[6] For a discussion of this, see Stephen Peter Rosen, *Winning the Next War: Innovation and the Modern Military* (Ithaca: Cornell University Press, 1994), pp. 13-14.
[7] John Ferris, 'Achieving Air Ascendancy: Challenge and Response in British Strategic Air Defence, 1915-40', in Sebastian Cox and Peter Gray (eds), *Air Power History: Turning Points from Kitty Hawk to Kosovo* (London: Frank Cass 2002), p. 34. See also John Ferris, 'Fighter Defence before Fighter Command: the Rise of Strategic Air Defence in Britain 1917-1934', *Journal of Military History*, 63:4 (1999), pp. 845-84.
[8] Ibid, *passim*.
[9] Jefford, *Op Cit*, p. 36.
[10] JDR Rawlings, 'Royal Air Force Fighters', *Wings of Fame*, Volume 5 (London: Aerospace Publishing, 1996), p. 147.
[11] JM Bruce, *The Aeroplanes of the Royal Flying Corps Military Wing* (London: Putnam, 1992), pp. 280-284 and 544-54.
[12] JM Bruce, 'From Pachyderm to Bird of Prey', *Air International*, August 1977, pp. 85-86; Francis K Mason, *The British Fighter Since 1912* (Annapolis: The Naval Institute Press, 1992), p. 138. Perhaps surprisingly, the largest sale was to the newly created Soviet Air Force, which bought 100.
[13] Jefford, *Op Cit*, p. 70; Rawlings, *Op Cit*, p. 149.
[14] Rawlings, *Op Cit*, p.148. Some Nighthawks were also sent to 8 Squadron in the Middle East, but only as a back-up to the squadron's main type, the DH9.
[15] Brett Holman, *The Next War in the Air: Civilian Fears of Strategic Bombardment in Britain 1908-1941* (University of Melbourne, unpublished PhD thesis, 2009), particularly p. 232.
[16] *Daily Mail*, 22 June 1922, cited in Holman *Op Cit*, p. 233.
[17] Brigadier-General PRC Groves, 'Our Future in the Air', *The Times*, 22 March 1922, cited in Holman, *Op Cit*, p. 56, also *Our Future in the Air: A Survey of the Vital Question of British Air Power* (London: Hutchinson, 1922). Groves had retired from the RAF as an Air Commodore in 1922, but had been granted the honorary rank of Brigadier-General, which he had held during the First World War, rather than using his air force rank.
[18] Holman, *Op Cit*, p. 55-56.
[19] Ibid.
[20] BH Liddell Hart, *Paris, Or the Future of War* (London: EP Dutton, 1925).
[21] Hines H Hall III, 'British Air Defense and Anglo-French Relations, 1921-1924', *Journal of Strategic Studies*, Volume 4:3 (1981), p. 271.
[22] John Ferris, 'The Theory of a "French Air Menace", Anglo-French Relations and the British Home Defence Air Force Programmes of 1921-25', *Journal of Strategic Studies*, Volume 10:1 (1987), pp. 63-64.
[23] Ibid.
[24] Ferris, 'Theory of a "French Air Menace"', p. 66.
[25] Young, 'British Home Air Defence Planning', p. 494.
[26] Ibid.
[27] Trenchard Papers, RAF Museum, MFC 73, 'Future Policy in the Air'.

[28] David Jordan, 'Sir Hugh Trenchard', in Matthew Hughes and Matthew Seligmann, *Leadership in Conflict* (Barnsley: Pen & Sword, 2000).
[29] For the complaints of soldiers during the Third Battle of Ypres and consideration of these aspects during defensive planning in late 1917, see The National Archives, AIR 1/524/16/12/20 and AIR 1/526/16/12/36.
[30] Hines, 'British Air Defense', p. 275.
[31] Ibid, p. 276.
[32] See Ferris, 'British Strategic Air Defence', pp. 26-27; Christopher Cole and EF Cheesman, *The Air Defence of Great Britain 1914-1918* (Oxford: Bodley Head, 1984) cover the development of home defence under Ashmore and Higgins in considerable detail.
[33] A brief outline of Chamier's career may be found at http://www.rafweb.org/Biographies/Chamier.htm (accessed 26 January 2018).
[34] Ferris, 'British Strategic Air Defence'. p. 27. Geoffrey Salmond later commanded Air Defence of Great Britain and succeeded his brother John as Chief of the Air Staff in 1933 (although he was already terminally ill at his appointment and died less than a month after taking office).
[35] *Parliamentary Debates (Hansard)*, House of Lords Debates 26 June 1923, Vol. 54, Columns 570-572.
[36] Ferris, 'British Strategic Air Defence', p. 33.
[37] TCG James, *The Growth of Fighter Command 1936-1940* (London: Frank Cass, 2002), pp. 2-3. As an aside, the benefits of formation flying for bombers had been proven during the First World War (see Cole and Cheesman, *Op Cit*), but proved to be of less utility during World War Two thanks to the increase in the capability of air defences.
[38] Ibid.
[39] Young, 'British Home Air Defence Planning', p. 497.
[40] Ibid.
[41] For the reorientation of air defence in the 1930s, see James, *Op Cit*, pp. 26-33.
[42] Ferris, 'British Strategic Air Defence', p. 31.
[43] James, *Growth of Fighter Command*, pp. 3-4.
[44] Young, 'British Home Air Defence Planning,' p. 497.
[45] For an analysis of the Defiant's rationale (and that of the 'turret fighter' concept, see Alec Brew, *The Turret Fighters: Defiant and Roc* (Marlborough: Crowood Press, 2002), pp. 5-20.
[46] David Zimmerman, 'Information and the Air Defence Revolution, 1917-40', *Journal of Strategic Studies*, Vol 27:2 (2004), p. 375.
[47] Ibid, p.376.
[48] James, *Growth of Fighter Command*, p.2.
[49] See Ron Mackay, *The Last Blitz: Operation Steinbock, the Luftwaffe's Last Blitz on Britain* (Walton on Thames: Red Kite Publishing, 2011).
[50] John Alexander, 'Despised and Neglected? British Fighter Defence 1922-1940', *RAF Air Power Review* Volume 18 No.2 (2015), pp. 162-181.