Through a Glass Darkly: The Royal Air Force and the Lessons of the Spanish Civil War 1936-1939

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The Spanish Civil War (SCW) 1936-1939 saw participation by 'volunteer' air forces from Germany, Russia and Italy, in order to test out the new realities of aerial warfare. Although the RAF is generally believed to have ignored the SCW to concentrate on preparing for war against Germany, in fact between 1937-39, the British armed forces purposely studied the SCW through two special joint Air War intelligence committees. This paper provides a broad picture of the work of the Air War committees, exploring the influence of SCW air power lessons as applied by the RAF leadership to bomber, fighter, close-support, army co-operation and weapons policy.

'For now we see through a glass darkly: but then face to face…'

I Corinthians 13, verse 12

The Spanish Civil War of 1936-1939 saw direct participation by the air forces of Germany, the Soviet Union and Italy in the guise of volunteers, seemingly intent to test out the new realities of aerial warfare and to learn vital lessons. Yet, in Great Britain, the Royal Air Force – the very torchbearers of air power – apparently regarded Spain as little more than an alarming distraction from the urgent need to plan and prepare for war against Nazi Germany. One historian bluntly stated that '…the attitude of the RAF towards the events in Spain can be described as one of general indifference.'[1]

It is difficult to believe that the RAF would choose to pay little heed to the first air war since 1918 and not seek to draw lessons from it, particularly when the stakes were so high. Some authorities claim that this decision created the ignorance of the developments that threatened to be Britain's nemesis in France during 1940 – the *blitzkrieg* weapons of the tank and close air support.[2] Instead, the RAF remained devoted to strategic bombing, their 'matter of faith', which was quickly shattered, in disastrous early raids on the German fleet.[3] An inevitable episode given one commentator's belief that the RAF was prepared to '…blithely ignore the lessons of Spain about the vulnerability of bombers to modern fighters…'.[4] The question has to be asked: Why should such perceptions have arisen?

Most studies of the interwar RAF have concentrated on the rise of strategic bombing as the central pillar of RAF strategy.[5] However, Air Ministry analysis of the Spanish Civil War resides in the Air Intelligence branch files, most of which were opened long after the release of most official documents. Many well-known works were written before the files were available and research naturally centred on better-known, more accessible sources. Furthermore, the picture was blurred by the ambivalent attitude of many RAF leaders, whose biographies often portrayed Spain as a dark cloud on the international horizon, not as a subject worthy of attention *per se*.[6] Yet, clear indications that the RAF did take note of the lessons of the Spanish Civil War do exist.

John Terraine's impressive 'The Right of the Line', does not ignore Spain, but makes several telling points about the influence, or lack of it, on the RAF. Terraine cites the Air Staff (AS) as having a tendency to learn the wrong lessons or to simply refuse to face the facts. To RAF eyes, the German Condor Legion '…gave the world a new lesson on the meaning of air power with the destruction of Guernica. Unfortunately, this lesson was so much taken to heart *that equally important ones were discarded* [author's italics]'.[7] There was little mileage in seeking to identify Spanish Civil War lessons if such lessons were to be considered heresy:

…the airmen could not see – let alone admit – that others might think differently [about strategic bombing]. Practical demonstrations did not convert them…the Madrid and Barcelona air raids…obscured the day-in and day-out activities of the air forces of both sides in

close support of ground operations.[8]

Although Hinsley's classic work on the WWII British Intelligence effort was compiled from official sources before most *intelligence* files were opened, he offers definite evidence of an alternative approach to the Spanish Civil War. While detailing the pre-war intelligence organisation, he states that of the Joint Intelligence Committee's activities '…the only one…which spawned sub-committees, *was the attempt to discover what could be learned about air warfare by studying the available information on operations in Spain and China.*'[9] He outlines the activities of two joint-service sub-committees that existed specifically to identify the Spanish Civil War lessons which the RAF is believed to have so 'blithely ignored'. In 1987, Wesley Wark, author of a perceptive history of British pre-WWII intelligence, illustrated the difficulties of learning lessons in peacetime by examining the RAF Air Intelligence Branch 1935 – 1939.[10] Wark's paper remains the only history of the Air War Spain and China Committees (AWSCC) between March 1937 and June 1939.[11] In a complete rebuttal of the belief that the British armed forces ignored Spain, Wark concluded that *Britain was the only country to make a directed effort to identify the military lessons of the Spanish Civil War*. The decision to form joint committees was both original and highly innovative, and deserved success. Unfortunately, it was destined to fail. Although considered by the Chiefs and Deputy Chiefs of Staff (COS/DCOS):

'*…a total of eight detailed reports on aspects of this small war failed to establish the right aperture for seeing the Spanish War…Both the CIGS and CAS responded…by perceiving them to contain threats to the doctrine and role of their services, based upon a failure, as they saw it, to understand the general irrelevance of the Spanish Civil War.*'[12]

Like St Paul in the opening quotation, the COS/DCOS peered through 'a glass darkly'. Straining through the mists of strategic orthodoxy, mirror-imaging and inadequate sources, they could only see '…the inappropriateness of taking Spain as any kind of a model for the conduct of war between first-class powers.'[13] They did not ignore Spain, *it was examined in detail and its relevance discounted*. The chance to learn germane lessons 'face-to-face' had to wait for WWII.

Wark acknowledges that the closure of the detailed Air War Spain and China Committees records and papers at his time of writing rendered his picture incomplete. Consequently, he makes no attempt to examine other questions. Were the Air War Spain and China Committee's findings accurate? Was the information disseminated appropriately? Should any lessons have influenced RAF policy and decision-making?

This paper attempts a more holistic approach to the subject of the RAF and the Spanish Civil War. It draws upon extensive original research conducted in the UK National Archives, (TNA) and aims to provide a broad picture that goes beyond intelligence to address those intriguing, unanswered questions. It starts by examining the shape of pre-war Air Intelligence and the formation, work and findings

of the Air War Spain and China Committees. It explores the decisions taken by the COS/DCOS on the Air War Spain and China Committees reports and considers the influence of Spanish Civil War lessons on other great powers. Finally, it attempts to follow the influence of the Spanish Civil War as applied by the RAF leadership to the vital areas of bomber, fighter, close-support, army co-operation and weapons policy.

The Evolution of Air Intelligence

Williamson Murray wrote that although modern military budgets devote vast sums to the collection, analysis and dissemination of intelligence, intelligence in peacetime still plays an ambiguous role in the evolution of national security. The utility of intelligence is often undermined both by the influence of the political leader's perceptions on the strategic analysis and the inability of analysts and decision-makers to view their opponents through anything other than a mirror image of their own courses of action and risk-assessments.[14] It is hardly surprising then, that the small, British interwar intelligence organisation found it difficult to evaluate the strategic situation and respond effectively.[15] To understand the development of the Air War Spain and China Committees reports and the COS/DCOS reactions, we must understand the evolution of RAF Air Intelligence.

Like the army, the Air Staff embedded Air Intelligence in the Directorate of Operations and Intelligence (DOps & I). However, Hinsley writes that the higher levels of the military showed both antipathy and disinterest in intelligence, '... intelligence was thought of as a professional backwater, suitable only for officers with a knowledge of foreign languages and those not wanted for command'[16]

Nevertheless, the RAF was aware of the need for increased intelligence. In 1935, the Air Ministry created a Group Captain Intelligence deputy to DOps & I, who would be appointed to Director status on declaration of war. Despite considerable Treasury opposition, an increase of staff was approved.[17] The Air Intelligence focus slowly shifted from the Middle East to Europe and Air Intelligence staffs were created at Home Command level. Air Intelligence's structure was geographically based, with the German section – AI3b – becoming increasingly heavily employed. Each section had a technical officer who collected data rather than proactively studied the technical progress of potential enemies.

Following a 1936 DCOS report on the central machinery for co-ordination of intelligence and discussions with the Secretary of the Committee of Imperial Defence (CID), two major revisions of British Intelligence occurred. The Committee of Imperial Defence's Industrial Intelligence in Foreign Countries Sub-Committee (FCI) gained an Air Targets Sub-Committee, with responsibility for all target information including photographic intelligence. The creation of the COS Joint Intelligence Sub-Committee in July 1936 was intended to assist the Joint Planning Staff (JPS) to co-ordinate the work of the three services in planning and conducting operations.[18] The Joint Intelligence Committee was intended to improve the intelligence

flow by providing a conduit to supply the JPS with intelligence of a joint-service nature.

By now, Air Intelligence staff were engaged in a constant battle to estimate the *Luftwaffe's* changing front-line strength and '…already at loggerheads with the Foreign Office (FO) over intelligence assessments. Neither department prepared to trust the expertise or judgement of the other.'[19] Worse still '…the Air Ministry's assumptions as to how the *Luftwaffe* would be used were so much modelled on the RAF's own plans that it not only neglected the available intelligence but also omitted to subject its acceptance of the prevailing opinion to technical study…'.[20] The 1936 move towards jointery should have increased the efficiency of the service intelligence departments, but the Joint Intelligence Committee:

'*…remained a peripheral body; one which had considerable difficulty in developing a function to supplement those already being performed by the intelligence branches of the service departments, the Industrial Intelligence in Foreign Countries Sub-Committee and the Joint Planning Staff, for several reasons. The planners did not call for its views except on topics on which intelligence was either of a routine nature or hard to come by. Nor did the Joint Intelligence Committee show any initiative in volunteering appreciations on important questions…partly because Service opinion in Whitehall frowned on speculation.*'[21]

Wing Commander Goddard, AI3,led the German section. He commented bluntly:[22]

'The Air Ministry founded a clandestine intelligence section section within Plans & Ops, CDS DQ – Is this correct or should it read Plans & Ops intelligence section? capable of giving air interpretations of the trend of military and economic potential in foreign countries in relation toAir Power [but even after 1936]…those highly responsible "policy proposers" preferred still to depend for intelligence chiefly upon their own two man illicit intelligence bureau…[who] had constituted themselves…as the filter through which all our advice was sieved…'[23]

Thus, from 1936 – 1939, British Intelligence was a flawed structure operating under considerable pressure. Wark notes that their contribution was essentially negative because each service portrayed a 'worst-case' scenario. This attitude caused the four JPS strategic appreciations produced between 1936 and 1939 to present a seriously skewed picture of German strength.[24] Despite clear successes in estimating the post-1936 *Luftwaffe's* front-line strength, the quality of long-range prediction was poor. There was an overemphasis on *Luftwaffe* striking power evidenced by the exaggerated fear of the 'knock-out blow'.[25] Official criticism of the likelihood of a knock-out blow appears to have been actively discouraged. The '…operating factors governing Germany's power to deliver a knock-out blow were not critically examined or the scale of attack questioned.'[26]

The Formation of the Air War Spain Sub-Committee

The Spanish Civil War not only posed a threat to international peace, but also offered the intelligence

community a potential laboratory in which to study the techniques and equipment of likely enemies. This was not lost on Air Intelligence. Within a month of the Spanish Civil War starting, Goddard had supplied the Deputy Chief of the Air Staff (DCAS) with details of aerial fighting and foreign participation. By October 1936, he was counselling that reliable data would be hard to obtain.[27] He informed Air Plans that 'The enclosed papers do not provide what you want…but you will see the nakedness of the hand of intelligence…'[28] However, by February 1937, a stream of intelligence had replaced 'the nakedness' and Air Intelligence were convinced of the importance of studying the Spanish Civil War:

…The amount of information is already more than the section – AI3d – can deal with… certain foreign countries are employing their aircraft and war material…as a means of trying them out for fitness for war, and since the tactics being employed by the air forces will undoubtedly have much to do with the tactics adopted in their respective countries, it is essential that a thorough investigation should be made…[29]

The Admiralty sought to persuade the Joint Intelligence Committee to formally study the Spanish Civil War. Surprisingly, Admiral S. H. Philips advocated a special sub-committee to study air warfare *alone*. He argued that the only information available on air warfare derived from 1914 – 1918 and was both limited and potentially misleading when applied to *modern* war. In the first use of a caveat that became much applied, he argued that '...this warfare may not be as intensive or as highly technical as that which may be visualised *in a future war between first-class European powers…*'.[30] Instead of welcoming Admiralty support, the Air Ministry reacted with a mix of anger and suspicion. One officer minuted '…the Admiralty may be seeking support for a theory that the effect of bombing operations is exaggerated.'[31]

German "Condor Legion" pilots and aircrew at La Cenia airbase, 1938

In Joint Intelligence Committee debate, the Deputy Director of Intelligence (DDI), Group Captain Medhurst, was unyielding. He stated that three officers were already engaged in sifting and collating Spanish Civil War information; he couldn't envisage '...what functions the Sub-Committee could usefully perform over and above the investigations now in progress in the Air Ministry.' He was prepared to let the Sub-Committee look at the accumulated detail, but was certain that '…it was undesirable that this work should be side-tracked.'[32] This is a clear example of 'collegiality'- the practice of intelligence assessments being made on the unchallenged

assumption of the superiority of the professional judgement of each service in their individual sphere of warfare and which marred the first three pre-war strategic appreciations.[33] The Deputy Director of Intelligence simply could not see what a *joint* committee could add to the Air Ministry's expert assessments. However, he was not to have his way. In May 1937, Goddard was ordered to chair the Joint Intelligence Committee Sub-Committee on the Air War in Spain – Joint Intelligence Committee (S).[34] The Joint Intelligence Committee Secretary instructed him 'To examine all available information on air warfare in Spain…', but reiterated the Admiralty's view of the relevance of the Spanish Civil War '…since we are not dealing with the operations of the metropolitan air forces of first-class powers [reports] should not include questions to which the air warfare of the Spanish Civil War cannot possibly provide the answers.'[35]

The Fiat CR32 was flown by the Italian "Aviazione Legionaria" and the Spanish Nationalist Air Force

Goddard had in fact already agreed this approach with the Deputy Director of Intelligence. He thought it necessary to '…show that Air Warfare as talked about nowadays, does not apply to the Spanish Civil War except in a minor degree.'[36] This decision automatically reduced the likely impact of the Sub-Committee's findings by accepting that Spanish Civil War lessons would probably not be applicable to Britain, but Goddard briefed Joint Intelligence Committee (S) members *not to merely list facts* – as proposed by the Admiralty – t*hey must draw conclusions and deductions,* '…otherwise the advantages of their combined expert knowledge would be lost.'[37]

The Joint Intelligence Committee (S) agreed a framework of reports and a comprehensive data collection matrix. This data bank has not survived, but consisted of 18 main headings and 103 separate sub-headings, covering everything from political background to bomb types.[38] Faced with the lack of sources in the country, the Joint Intelligence Committee (S) intended to use all data effectively.

Sources

The normal source of Spanish foreign and military intelligence was from diplomats and military attachés located at British embassies in Lisbon, Paris and Madrid. However, the embassy in Madrid soon evacuated to Hendaye, exiling the only air attaché in Spain, Flight Lieutenant Pearson, to Valencia. Goddard's hopes for useable intelligence were dashed. He wrote to the Foreign Office '…Pearson has done his best, but I think that the Government authorities…[believe] our attachés are probably informers for Franco...Our efforts to get in touch with authoritative opinion on Franco's side have been abortive…'.[39] Wark comments that Air Intelligence

attempted to make up for the loss by '...harrying these consuls [the British consuls in Madrid, Barcelona, Valencia and Cartagena]…for a volume of air raid reporting on the effects of air raids…'.[40] Certainly, Goddard was convinced that '…it is one thing to refrain from intervention but quite another to be ignorant of military developments in the air in which we cannot possibly afford to lag behind.'[41] However, the results were very patchy.[42]

The many visitors to Spain offered alternative sources of information. These included MPs, retired officers and press representatives; the media was very active in debate about the Spanish Civil War. The disaster of Guernica, the bombing of Madrid and Barcelona, all attracted shocking newsreel footage which, when shown before popular film matinees, cemented the image of the 'air menace' and the 'knock-out blow' in the mind of the British populace.[43] The poor quality of press reports meant that credence was usually only given to them when all other sources were unavailable. Visiting MPs had a double-edged effect on the Air Intelligence study. Those with previous military training were able to offer valid impressions of the fighting.[44] However, their visits sparked emotional debates in Westminster and some criticism of the British attitude to Spanish Civil War lessons.[45] Former officers included such luminaries as Major-General J. F. C. Fuller who made two visits to Nationalist Spain during 1937.[46]

There were to be no Secret Intelligence Service resources available to the Joint Intelligence Committee (S), although they considered they needed such assistance.[47] The final source of data came from actual combatants. Several British airmen served in the Spanish Civil War and the FO kept files on most of them.[48] Some were interviewed in Spain by air attaché Pearson and others debriefed in Britain. Some provided excellent material, but their true value seems to have gone unrecognised.[49]

Summaries of Information

Contrary to Corum, Air Intelligence data on Spain was released to the RAF throughout 1936 – 1939.[50] A weekly summary of information was circulated to the Air Staff from July 1936 and Spain invariably featured in Air Intelligence monthly summaries until July 1939. These were not highly classified, covered political, military and aerial activity and released revealing detail on such activity as bombing and ground attack, for widespread use.[51] From April to October 1937, Joint Intelligence Committee (S) activities were aimed at the production of detailed reports. The results were considered to be 'interim', as more detailed data was arriving, and the Joint Intelligence Committee (S) sought future direction.[52] The three reports – 'Anti-Aircraft Artillery Defence', 'Air attack on Fuel Oil Storage' and 'Low Flying Attack on Ground Forces', were put to an extraordinary meeting of the COS in October 1937.[53]

The Joint Intelligence Committee (S) Reports

Report No. 1 on Anti-Aircraft Artillery Defence evinced the difficulty of collecting data from Spain. This report was later to attract adverse criticism from the War

Office (WO). The Sub-Committee on Bombing and AA Gunfire Experiments reported that '...the practical value of the reports on air warfare in Spain was almost negligible as...records of the essential factors [speed, height of aircraft] were seldom ascertained…The essential factors were in fact...virtually unobtainable'.[54] However, despite noting that forces were '…badly-trained, poorly armed and deprived of essentials…' it ignored the fact that '[they still]…managed to achieve important results and forced bombers to fly high with consequent lack of accuracy.'[55] Comment was made on the excellence of the German AAA forces, the utility of their 88mm guns and the need for aerodrome defences. Yet by caveatting that the results '…fell short of first-class powers…' and not seizing upon the German performance as indicative of their potential in a wider war, the paper proffered mixed messages.[56]

Report No.2 on Air attack on Fuel Oil Storage stated that there was little to learn but for the apparently insignificant fact that fuel storage had been set alight by bombs, incendiary bombs and machine gun (MG) ammunition with equal facility. The RAF, unsure of its operational aims, did not realise that these results could help frame the future Bomber Command operational plans against Germany.[57]

The most important paper, No. 4 detailed the impact of 'Low Flying Attack upon Ground Forces' and covered the bulk of air activity in Spain. In theory, it should have indicated that ground attack was now a vital element in warfare. It contained a '…combination of vivid but fragmentary detail, specific lessons and a general negative caveat about the relevance of the Spanish Civil War.'[58] It made telling points about the vulnerability of undefended troops, lacking air-raid warning and camouflage, to air attack. It found that '…every report on mobile military ops stresses the positive effects of aircraft operating… with ground forces and…the demoralising effect of the absence of AAA and or aircraft.' but stressed that '…tactics until latterly have not shown close ground-air co-operation.' The scale of attack had been small and troops were poorly trained when compared to the 'first-class powers'. Yet despite the 'second-class' slant, the most telling paragraphs concluded that '…the moral effect of air action against ground troops when aircraft are employed resolutely in conditions of undisputed air supremacy at the right time and place *has been out of all proportion to the material results achieved*. Furthermore, 'Material results *have been considerable* [author's italics]…Low-flying attack with machine guns or bombs was undoubtedly more effective in battle than bombing, especially high level bombing, alone.'[59] Although obscured by the many caveats, the importance of ground-attack aircraft in Spain and to future conflict was clearly identified in Report No. 4. (CDS DQ – Report 3?)

The COS and the Joint Intelligence Committee (S) reports

That the COS met specifically to consider the Joint Intelligence Committee (S) reports shows the value British forces placed on Spanish Civil War lessons. Unfortunately, the reports arrived during a period

of 'détente' between the RAF and the *Luftwaffe*. In January 1937, the DCAS, Air Vice-Marshal Courtney, visited Berlin with several officers including Goddard. The COS met on 19 October 1937 – *the very week that Luftwaffe Generals Milch and Udet were in London on the reciprocal visit.*[60] The RAF viewed Spain in 1937 as an irrelevant conflict, but they were also convinced that they knew the Luftwaffe shared their viewpoint.[61] In addition, Deverell, the CIGS, was engaged in a parochial battle with Hore-Belisha, the Secretary of State for War, on the role of the Field Force (FF) and the relevance of the continental commitment.[62] He was not inclined to release resources to the RAF, which could further weaken the FF. The Joint Intelligence Committee (S) reports were reviewed by Newall (CAS), Deverell and Chatfield, the Chief of Naval Staff (CNS), accompanied by the Secretaries of State for War and Air, chaired by Sir Thomas Inskip, the Minister for Co-ordination of Defence.

The minutes make it clear that the COS were disinclined to accept major lessons from Joint Intelligence Committee (S) reports. The CNS pointed out that '…it would be helpful to consider these reports…*even though…no lessons of importance could be learned from them*. It was possible that certain technical lessons could be learned from them.'[63] The report on AAA Defence received considerable attention and emphasised that aerodrome defence needed further consideration. Deverell, conscious that the FF needed AAA resources, was adamant, '…the Report had been drawn up on meagre evidence…It was necessary to exercise care in the conclusions which should be drawn…' Hankey ruled that the Air Ministry should review the defence arrangements for RAF aerodromes.[64] CNS found the report on oil storage to be too limited to draw conclusions; another report would be needed. The vital paper on low-flying attack attracted the CAS's only real intervention. When Hore-Belisha noted *the use of aircraft in protecting ground forces*, Newall interjected that '…this was a gross misuse of resources [apparently]…the Italians were so impressed with the results of low-flying attack that they had diverted 50 per cent of their aircraft to this role.'[65] He was not about to follow their example. The COS concluded that the Joint Intelligence Committee (S) should report further, the RAF should examine aerodrome defences and any existing air defence organisation weakness was to be discussed interdepartmentally and reported to Hankey.

Hinsley suggests that the reports had little influence because their lack of detail rendered them inconclusive.[66] This was not true of the ground attack report, which contained considerable detail, particularly from victims of low-flying attacks. Sadly, the COS were not susceptible to suggestions that they should look for revelations. A '…highly conservative British approach to the tactical innovations… of the small wars…was established as a reflex action.'[67]

The Joint Intelligence Committee (A)

In April 1938, the Admiralty suggested, against opposition, that the Joint Intelligence Committee (S) should be expanded to consider

all air warfare. However, there was a strong counter-opinion that the Sino-Japanese conflict provided a fertile study ground and should be included alongside the completion of the Spanish Civil War work. Once again the Air Ministry seemed reluctant to work jointly. The Deputy Director of Intelligence stated that '…Goddard could not be further deflected from his normal work.'[68] The Joint Intelligence Committee (S) continued to work, publishing a final report on the Spanish Civil War threat to the Straits of Gibraltar.[69] Following adverse WO comment upon the value of the report on AAA Defence, the position of the Sub-Committee was reviewed, but the Joint Intelligence Committee finally decided to expand the Joint Intelligence Committee (S) to '… examine all available information on air war in Spain and the Far East…' as the Joint Intelligence Committee Air War – Joint Intelligence Committee (A).[70] Goddard, though replaced as Chairman, retained responsibility for gathering intelligence.

In July 1938, the Air Ministry was focused even more firmly on the growing German threat, but Spanish Civil War lessons could still be useful. Air Secretary of State Swinton wrote to Newall on the role of the RAF in national defence, stressing that '…the impression has been given, perhaps quite wrongly by events in Spain, that bombing is still an indiscriminate weapon which can cause considerable material damage but cannot as yet be directed with accuracy and effort…'.[71] Swinton apparently wanted 'to give a true and unbiased account not only of the tactics…but also the lessons which can be drawn…for a responsible people' not realising how closely Britain's bombing capability resembled that 'wrong impression'.[72] Dutifully, Goddard struggled to obtain corroborating Joint Intelligence Committee (A) data from the FO. He wrote 'I am sure that the British Minister and the military attaché [know we]…need information regarding the effects of bombing but in fact little authoritative information comes through.'[73]

By November 1938, difficulties with Joint Intelligence Committee (A) resources were becoming apparent. The Munich Crisis led to the extensive revision of British war plans for war with Germany. Available manpower was at a premium and the Joint Intelligence Committee (A) members were needed for other duties. Home Office Air Raid Precaution support to the Joint Intelligence Committee (A) became problematic and important work on passive air defence was abandoned and '…attributed solely to the shortage of staff.'[74] In February 1939, four of eight planned reports had been completed and a proposal to dissolve the sub-committee was tabled.[75] While awaiting Joint Intelligence Committee approval, it was decided to complete a fifth report and provide an air tactics paper, but by March, Germany had occupied Prague and 'The COS thought that if Germany were to attack Poland, the right course would be that we should declare war on Germany.[76] The COS were too preoccupied to consider the five completed Joint Intelligence Committee (A) reports, and they were passed to the DCOS.[77]

The DCOS and the Joint Intelligence Committee (A) reports

On 10 July 1939, Goddard, now

Deputy Director of Intelligence, presented five Joint Intelligence Committee (A) reports to the DCOS:

1. DCOS 100 – Air Attack on Sea Communications.
2. DCOS 101 – Air Co-operation with Land Forces.
3. DCOS 102 – Air attack on Industry.
4. DCOS 103 – Effects of Air Warfare on Internal Communications.
5. DCOS 104 – Active and Passive Defence.

But the pattern of 1937 was set to be repeated. The DCOS vision of the forthcoming war could not be affected at this late stage. As Wark surmises, '…the Spanish Civil War could never have served as a substitute parable for war…[it was] too unusual a theatre of war for that with too marginal an employment of advanced technology.' The reports were too disjointed with their mix of 'Close intelligence observation, with its technical details of equipment and events, [vying] for attention with possible lessons…from tactical innovations in that war.'[78]

DCNS suggested that the reports should be widely circulated to ministers and commands, but inevitably it should be indicated '…where the circumstances differed materially from those likely to obtain in a first-class war.'[79] The report on air attack on sea communications reinforced the negative approach stating that '…neither side in Spain possesses equipment of the standard or on a scale that might be expected in a war between first-class powers.'[80] Although strictly true, Air Intelligence knew that very large-scale fighting was occurring. For the Battle of Brunete in July 1937, the Nationalists had assembled 200 aircraft and the Republicans 400 aircraft; air battles saw over 200 aircraft in action simultaneously.[81] The report identified 'considerable' Nationalist success against Republican shipping with a small force of aircraft from Majorca. Traffic had been immobilised and ports seriously damaged, yet the report merely commented that this could not be replicated on Britain without a significantly greater effort.[82]

The report on Air Co-operation with Land Forces posed a direct question about the validity of RAF air support policy, but it also ambivalently portrayed the use of low-flying attack as an expediency forced upon 'second-class powers' in Spain. In un-industrialised Spain, ground forces presented the only worthwhile target. Nothing matched the target array required for the Air Staff's vision of independent air action.[83] The report supported the British position on this 'exceptional' use of ground-attack aircraft by quoting the German CAS's opinion as '…aircraft should not be used in the bombardment of the front line but are better employed on attacking communications and targets in the forward areas.' In addition, the '…general [ground-attack] employment of Italian units was largely at variance with Italian ideas on the use of air power in a major war.[84] However, the report recognised that '…the provision of aircraft for this purpose is undoubtedly receiving serious consideration by foreign powers…Italy, Germany, Japan and certainly Russia [sic]'. It also stated that the *Luftwaffe* '…has a specially

developed type of aircraft for close support and that the German Army is introducing special AA defensive organisation against such aircraft.'[85] Wark correctly wonders why '…a first-class power…should learn such lessons and develop such weapons… without comment by the Joint Intelligence Committee (A).'[86] This did not occur to the DCOS. Tellingly, the report concluded that the case was proven '…if the full effectiveness of aircraft…in close support is to be obtained…there seems to be a prima facie case for a special design.'[87]

The last major report considered active and passive air defence of cities and deployed forces.[88] 'The special nature of [Spain]…encouraged an exceptional use of aircraft against ground troops' but it also created a need for fighter escorts.[89] Both sides escorted bombers attacking inland towns and although Spain was a 'short-range' war, the Italians were '…devoting considerable attention to long-distance fighters. The Fiat CR 25, with a range of 1550 miles was in production in 1938.'[90] Ground-attack aircraft were also escorted. 'The number of protective fighters was sometimes as many as twice the number of aircraft engaged in primary ground-attack.'[91] The closing comment pointed clearly to the new reality of battlefield air attack:

'The power of the air weapon against troops in the field was impressive even when its influence was mitigated by moderate AA defences…The conclusion cannot be avoided that the threat of air attack, extending to great distances beyond the forward troops, makes necessary an ample provision for the active and passive defence of armies in the field.'[92]

But the DCOS meeting closed without modifying the Committee's view that there was '…any weakness in the potentialities of bombing, for if this had been the conclusion, the estimate of German capability to deliver a 'knock-out' blow against England would have been revised'.[93] Instead, the accumulated intelligence of two years of study was:

'…taken to indicate that the airforces in Spain…had been inadequate to exploit the situation…Where opportunity did present itself of vindicating the power of the bomber, it had been lost by bad management. Regarded in this light, the main lessons to be learnt were negative. They were taken to indicate lines of policy that should not be adopted…[94]

Lessons of the other great powers

Britain was not the only nation unable to clearly discern air power lessons from Spain; all interested nations struggled to do so. To Coox, the 'Experiences of Ethiopia, Spain and China seemed irrelevant and atypical. The victorious allies of the WWI tended to regard their conduct of operations in that war to have been vindicated by ultimate victory.'[95] Without direct combat experience, France and the USA both found it difficult to identify relevant air warfare lessons from Spain.

In France, the supremacy of defensive doctrine went relatively unchallenged by the Spanish Civil War. Failure in battle was thought a result of faulty defensive doctrine and poor weapon quality. The dominance of WWI tactics remained. France read the Spanish Civil War as negatively as Britain because her strategic orthodoxy was just as powerful.

The American Army Air Corps shared the vision of the primacy of the strategic bombing offensive with Britain and their study of the Spanish Civil War exhibited similar attitudes. Assistant Chief of the Air Corps, Brigadier-General 'Hap' Arnold:

'…commented briefly, dismissing it as irrelevant to modern warfare…He noted that strategic bombing had not been carried out because it was civil war. Air power in Spain had been used extensively in interdiction campaigns in support of ground forces…He advised against drawing lessons from Spain.'[96]

Greer writes 'It was argued that the light bomber had proved effective in Spain as a weapon of ground support [but the Air Corps]…tended to answer that attack planes should be designed for their *proper* purpose rather than for close support of ground units.'[97] As a result, by 1941 '… no suitable type existed. It was stated that the discarding of attack aviation had resulted from observations of the Spanish Civil War, in which such aviation had been unsuccessful.'[98]

The Polikarpov I-16-10 "Rata" was the Soviet Union's most advanced fighter. It was flown by Soviet pilots as well as being license-built in Spain for the Republican Air Force.

In the Soviet Union, Italy and Germany, the powerful advantage of detailed feedback on operations and tactics was available, yet drawing the correct lessons proved to be almost as problematic as for Britain, France and America. The combatants incorporated Spanish Civil War lessons to formulate their approach to WWII. This ensured that they took advantage of valid innovations, but meant that acceptance of flawed lessons left a flawed doctrine for the WWII battles.

The Soviet Union contributed 1,000 personnel and 909 aircraft to the Republican cause. Their Spanish experience led to fundamental decisions about the validity of strategic bombing and close support of ground troops. Soviet Air Force General Lapchinsky, a pre-Spanish War advocate of Douhet, wrote that 'Strategic bombing could only be effective after the enemy's military resistance had been broken [based on Madrid and Guernica] and…only possible after military resistance was broken because until then all available Airpower *would have to be directed against the front.*'[99] The revised field service regulations of 1939 '…defined the air mission as being to reinforce the ground forces 'in the direction of the main effort'[100] Consequently, the Soviets disbanded the only European heavy bomber fleet. More positively, the success of the Soviet R.5/R.Z attack biplanes spurred the development of the IL-2 Sturhmovik, which became an essential part of post-1941 air-ground operations.

Italian experience in Spain proved as confusing. Despite contributing its most modern aircraft in substantial

numbers, COS General Valle, considered that they learnt nothing from the Spanish Civil War.[101] Before the war the *Regia Aeronautica* had been essentially Douhetian in approach, but the ground support operations advocated by Mecozzi proved effective in Spain. According to Sullivan the:

'Aviazione Legionara was left free to test both Douhet's and Mecozzi's concepts as Rome ordered. These experiments convinced Valle that ground support ops would defeat the Republic more quickly but Valle's opponents forced him to continue terror bombing and Regia Aeronautica operational doctrine remained confused afterwards.'[102]

Returning from Spain, the 19,000 German "volunteers" were cheered at large military parades. They brought valuable combat lessons as well as suntans and medals

In, particular, the failure to develop new fighter tactics had far-reaching effects. The predominance of Spanish Civil War veterans in the Air Ministry stifled tactical innovation and doctrine remained Spanish Civil War-based until 1941. Furthermore, the confusion over the validity of ground-attack prevented the Italians ever developing an effective close support aircraft.[103]

Early commentators argued that the Condor Legion experience dictated German air doctrine and forced the *Luftwaffe* to become 'the handmaiden of the army'.[104] Corum insists that the *Luftwaffe* had a well-balanced air doctrine before the Spanish Civil War, which permitted both strategic bombing operations and army support. Spain allowed them to perfect ground-attack techniques to such an extent that COS Von Richtofen successfully advocated a specialised ground-attack force before WWII.[105] Spanish Civil War lessons heavily influenced fighter tactics and bombing doctrine, confirming that fighter escort was needed for bombers and that '…attacks on armies could lead to an earlier victory than the bombing of economic resources and armament factories.'[106] Improvements were necessary in night and bad weather navigation while dive-bombing proved capable of being an effective substitute for horizontal bombing. But no improvement was made in bomber armament; *Luftwaffe* aircraft remained without armour protection and defended by single, free-mounted machine guns. However, Proctor states that overall, 'Many of the Germans who survived both wars are of the opinion that in the long range the negative outweighed the positive.'[107] What the Spanish Civil War did provide was a core of 19,000 combat veteran *Luftwaffe* personnel who were to play key roles in the forthcoming WWII.[108]

The Air Staff and the Lessons of Spain

That the COS/DCOS did not re-orient RAF doctrine as a result of the

Air War Spain and China Committees studies did not mean that their efforts were in vain. Perhaps the Spanish Civil War was too unusual a conflict to take as a model for future war; all the great powers experienced difficulties in identifying correct lessons from it. Yet, Air War Spain and China Committees reports contained extensive detail, which could have informed the RAF of the direction and pace of German technology and given an insight into emerging German doctrine and tactics. A study of Air Staff decision-making 1936 – 1939 reveals that influential officers *were well informed* about Spain and made key decisions in the light of Spanish Civil War lessons. Spain stimulated important debate on tactics and weapons and influenced such vital discussions as air support for the Army in France.

Armour and Weapons Policy

The writer who thought that the RAF '…blithely ignored the lessons of Spain about the vulnerability of bombers to modern fighters…' does not realise the efforts the RAF went to in 1936 – 1939.[109] Although an Air Staff officer wrote that:

'…admittedly, there have been pressing developments in the techniques of interception and fighter operations, [but]…the advantages conferred on the bomber by the amazing developments in speed are beyond dispute…we cannot rely on our close defences to save us…'[110]

Air Commodore Slessor, Director of Plans (DPlans), was unimpressed and wrote 'Experience in Spain by no means bears out that statement…we have so little knowledge of first-class warfare'[111] While such optimism was being expounded, crash programmes to armour RAF aircraft and up-gun bombers were in progress. Jones states that the RAF '…formed the most accurate assessment of the hazards of daylight operations… bombers [needed]…powerful defensive armaments…in power-operated turrets.'[112] In 1936, the RAF issued two bomber specifications. The pilot was to have armour protection and all aircraft were to be heavily-armed with powered machine gun turrets.[113] Air Chief Marshal (ACM) Dowding of Fighter Command was already concerned about the ability of his eight .303 machine gun-armed fighters to defeat armoured German bombers and cannon-armed fighters. Spain offered hope of establishing whether the RAF was lagging behind. The question was asked:

'…is armour being applied to the latest types of aircraft engaged in the Spanish war and if so what thickness…our present policy is to ask for a measure of protection for pilots of single seater fighters...[but] we accept the engine as being armour in itself.'[114]

Air Intelligence knew the Germans had experimented successfully in combat with armour in Spain.[115] Incendiary ammunition had been particularly successful and explosive ammunition had been used against International convention. Cannon had been reported on French and German aircraft as early as April 1936.[116] Faced with the prospect of cannon-armed enemy fighters, an Air Fighting Committee (AFC) meeting concluded that the "…single engined fighter is invulnerable to .303 [fire]."[117] ACM Ludlow-Hewitt wrote to the Air Ministry seeking action '…Bomber Command cannot accept a state of complete helplessness

against the single-seater fighter'.[118] The up-gunning of bombers, more ammunition and speedy provision of enhanced armour offered the only answer.

Dowding also revised his position stating '…I consider that armour and bullet proof windscreens are fundamental requisites for modern fighters in view of the tactics, which they have to adopt [stern attacks].'[119] Air Intelligence then confirmed the use of armour in Spanish Civil War by Nationalist attack aircraft. They thought it *likely* that the Germans were considering protecting other aircraft, but later reports confirmed that German aircraft were not generally fitted with armour plating.[120] By October 1939, panic action on bomber armour was underway and the RAF was gaining the advantage; Sholto Douglas, the Assistant CAS (ACAS), wrote that all Hurricanes and 50 per cent of Spitfires had received armour, with 20 Spitfires being fitted each week.[121] German aircraft remained unarmoured at the outbreak of war.

Groundcrew work on Hurricane Mk 1

The question of bomber armament vexed the Air Staff. One officer, fearing enemy fighters armed with 20mm or larger calibre guns '…could not visualise the possibility of bombers being armed with an equivalent number of these weapons... [and] the bombers defence would therefore become inadequate...'[122] The only option was larger guns further reducing speed and bomb load. An order for 20mm cannon turrets was placed in 1937, but crucially the bomber would have to be built around large gun turrets if it was to carry usable loads at speed. This was incorporated into the design of the B.1/39 bomber, but the .303 machine gun would have to remain the standard for at least five years.[123] Unfortunately, Beaverbrook, the Minister for Aircraft Production, stopped all cannon-turret work in 1940 and none reached British bombers in wartime.[124]

The Spanish Civil War should have been able to offer advice on bomb requirements. The Air War Spain and China Committees had often attempted to equate bombing effect with the size of weapons used. Some graphic results from raids on Madrid were reported, but there was little technical examination. [125] In mid-1937, the RAF's biggest bomb remained a 500lb weapon but:

reports from Spain indicated that the favourite bomb used against buildings was the 225 kilo [650lb] pound…The 2,000lb bomb is twice the load capable of being carried on Battle and Blenheim aircraft…There would seem to be a need for the design and supply of a 1,000lb bomb for attacks against heavy machinery targets.[126]

Production of a 1,000lb weapon was approved in 1938, but it was not available until June 1939. Ludlow-

Hewitt was anxious to use the weapon against transport targets.[127] Spain offered relevant examples, some of which could influence plans '…it would appear that in the majority of attacks on railway lines, repairs have been possible with considerable rapidity. This indicates the desirability of harassing repair gangs by further carefully timed attacks if possible'.[128] Further evidence showed the potential vulnerability of the oil system 'The lessons of the Spanish Civil War seem to show that undefended tanks can be destroyed by aircraft with the greatest of ease; passive defence measures… show no guarantee that installations may not be destroyed completely.'[129]

Escorts

Escorts for bombers had come to be regarded as a 'hardy annual' by the Air Staff, but numerous Spanish Civil War reports stating that large numbers of escort fighters were being used, prompted a vigorous Air Fighting Committee discussion in June 1937.[130] However, the Air Fighting Committee shared the reservations of the Air War Spain and China Committees. DCAS, influenced by his *Luftwaffe* visit, stated 'I have no doubt…that the concept of fighter escorts is essentially defective.' The Germans had told him that '…the circumstances of [Spain] were quite peculiar and very unlike…a war between two air powers.'[131] Dowding, usually such a forward-thinker, dismissed the Spanish Civil War as irrelevant; the conditions would not obtain in a European war. Large-scale use of escorts resulted because fighters were cheap, available and useful in a short-range war. Bombers were rare and expensive.[132] Fighters

The German "Condor Legion" tested the Messerschmitt Bf 109 E-3 in Spain in early 1939. The E-3 became the mainstay of the Luftwaffe fighter force in the Battle of Britain

could be easily drawn off, leaving the bombers vulnerable. The Air Fighting Committee agreed that this ruled the single-seat fighter out as an escort but"...fighters with their firepower mainly aft could be used to accompany the bombers...If multi-seater fighters could be used in the formation...the aircraft in question would be virtually a converted bomber...'[133] [The British tactical innovation resulting in the Defiant being armed purely with four turret-mounted machine guns proved a singular failure.][134] The single-seater fighter could be discounted because it was thought Germany had no plans for long-range fighters.

The question would not go away. Further Air Intelligence reports on escort fighters in Spain surfaced in 1939. Sholto Douglas maintained '...It is true that the Germans sometimes escorted their bombers in Spain partly because their armament in German bombers is…weak and ineffective and they are therefore easy prey to enemy fighters.' Details of the long-range Messerschmidt 110 fighter were now known, but Douglas considered it an unsuitable

escort because it lacked enough *rearward-firing guns*.[135] What he wanted was '…a turret fighter with a fairly long endurance so that it could, if required, carry out *offensive* patrols over German territory.' Plans agreed '…our big bomber policy will enable us to operate in future with small formations, or even with single aircraft, in which case escorts would not only be extremely uneconomical but would also tend to rob our tactics of flexibility.'[136]

Air Support

The Spanish Civil War should, at least, have spurred a re-evaluation of RAF support for the Army. Instead, Slessor (DPlans), who was ideally placed to influence policy, and had published a respected work on army-air co-operation in 1936, [137] spent three years rebutting army demands for greater support. His view of the Spanish Civil War was not positive. Reviewing a proposed joint RAF-Army memorandum on FF AA defence, after the COS decision on the Joint Intelligence Committee (S) reports, he commented that '…these papers show an obsession on the part of the General Staff with the least probable form of land operations, namely a campaign in France'. He thought:

...experiences in Spain…cannot be taken as…conditions which would obtain in modern warfare between two highly organised, fully equipped armies and air forces…Nevertheless, increased use of low flying aircraft against ground troops is undoubtedly a method of modern warfare, which the British organisation must take into account, [but] low flying attack is likely to be very costly...[138]

The RAF viewed ground-attack as a third or fourth priority task. Terraine quotes Maurice Dean as saying '…between 1918-1939, the RAF forgot how to support the army.'[139] The FF in France was to be supported by a small Air Component of fighters and reconnaissance aircraft with a group of Battle bombers (the AASF) operating independently. The bombers were not for direct support (DS) of troops. The Army produced demands for extra aircraft in 1939 using supporting evidence from the Spanish Civil War.[140] Slessor refuted their demands:

'…the results obtained were usually disappointing compared with the losses sustained except under certain, special and infrequent circumstances. On nearly all occasions, much more favourable and important objectives could have been selected. Nevertheless, events in Spain have tended to raise a doubt about the view that the aircraft is not" a battlefield weapon"…'[141]

His view incorporated the experiences of 1914 – 18 and the Spanish Civil War and pointed inevitably to the same conclusions:

a. Aircraft were not a substitute for artillery.
b. Without artillery, the use of aircraft for attacking deployed troops in positions was limited; more effective targets could be found further back.
c. Special and infrequent conditions were needed; local air superiority; enemy lack of small AA; a high degree of training and morale; careful orders, organisation and control.

Not all RAF leaders agreed with him and some effort was made to identify a direct support bomber requirement

to appease army sensitivities. A two-seat, four machine gun turret-armed aircraft with a 1,000lb bombload was specified for direct support work but there would be no dive-bomber despite Army wishes.[142] Regrettably, the time had now come to learn the lessons 'face-to-face'. Disaster in France occurred before any suitable aircraft could be identified. Despite undoubted bravery, appalling losses resulted when obsolete AASF Battles were thrown into direct support regardless of the air superiority situation.

Conclusion

Seventy years of hindsight leads many to suggest that the RAF should have been better prepared for war against the 'Ultimate Enemy' of Nazi Germany. Webster and Frankland certainly found it '…a strange result after twenty years of devoted work.'[143] Corum suggests that the RAF was actually '…the air force that was least capable of learning and adapting…an intellectually shallow service – a sort of gentlemen pilots club.'[144] This short paper has attempted to give the lie to such views.

The Interwar RAF did not continually and effectively assimilate the fast-changing pace of aerial technology. But it was not alone. Ferris writes 'One would think the RAF to be the only air force on earth to make mistakes, and the worst at procuring new equipment and in preparing for strategic bombing and air defence; and each of these thoughts would be wrong.'[145] All nations struggled to find their way in air warfare, the Spanish Civil War potentially offered to all an example of what modern aerial warfare *could* be.

This paper has sought to show that, although a little publicised fact, the RAF never ignored the Spanish Civil War. The British forces made an innovative and rare decision to *act jointly* to study Spain and air *warfare*. Two years of effort was expended by 20 per cent of available Air Intelligence resources. The results were widely promulgated and eight highly-detailed reports presented to the highest levels of the politico-military command structure. Senior RAF leaders discussed and debated Spanish Civil War lessons when making decisions on vital questions of fighter, bomber and close support policy. Regrettably, the effort failed to produce far-reaching results.

Wark accurately sums up this failure as the norm for intelligence services in peacetime and this paper has illustrated how even the Spanish Civil War combatant nations found it difficult to identify valid lessons. The intelligence services could not easily make allowances for the discontinuities between past, present and future when applied to a period of rapid technological change.[146] Military leaders could not reconcile the small, distant, civil war with its mix of highly modern technology and small forces with their WWI-based concept of a future massive clash between highly trained air forces. *St. Paul's 'glass' was simply too dark for them*. Goddard later wrote '…the English have a dangerous tendency to confuse beliefs with facts and where facts conflict with traditional thinking, to reject them. Thus we come to right action by a very hard route."[147] The route was hard indeed; almost six years on the 'Road to Damascus' and final victory.

Notes

[1] James S. Corum, 'The Spanish Civil War: Lessons Learned and Not Learned by the Great Powers', *Journal of Military History* 62 (April 1998), 315. Such attitudes are closely examined in my forthcoming doctoral thesis on 'The RAF and the Lessons of the Spanish Civil War'.
[2] Charles Messenger, *The Art of Blitzkrieg*, (London: Ian Allan, 1976), 105-114 and 134-156.
[3] MRAF Sir John Slessor, *The Central Blue* (London: Cassell, 1956), 204. Also Scot Robertson, *The Development of RAF Strategic Bombing Doctrine 1919-1939* (Westport Ct: Praeger, 1995). Introduction and 165.
[4] Corum – 'Lessons Learned', 331.
[5] Typically, Neville Jones, *The Beginnings of Strategic Air Power – A History of the British Bomber Force 1923-1939*, (London: Frank Cass, 1987).
[6] Slessor, *Central Blue*, 150 and 194-5. Also MRAF Bomber Harris, *Air Offensive* (London: Greenhill Books, 1990).
[7] John Terraine, *The Right of the Line – The RAF in the European War 1939-1945*, (London: Hodder & Stoughton, 1985), 46.
[8] Terraine, *Right of Line*, 64.
[9] F. H. Hinsley, *British Intelligence in the Second World War*, (London: HMSO, 1979), Vol. I, 37-39.
[10] Wesley K. Wark, *The Ultimate Enemy - British Intelligence and Nazi Germany 1933-1939*, (London: I. B. Taurus, 1985).
[11] Wesley K. Wark, 'British Intelligence and Small Wars in the 1930s', *Intelligence and National Security*, October 1987, 67-87.
[12] Wark, 'Small Wars', 77.
[13] Wark, 'Small Wars', 81.
[14] Williamson Murray, 'Appeasement and Intelligence', *Intelligence and National Security*, October 1987, 47-67.
[15] Murray, 'Appeasement and Intelligence', 48.
[16] Hinsley, *British Intelligence*, 8-10.
[17] The UK National Archive [TNA] –AIR/2/1688, DDI Branch Staff Requirements.
[18] The JPS consisted of the heads of the three service plans sections. See Hinsley, British Intelligence, 32.
[19] Wark, 'Small Wars', 71.
[20] Hinsley, *British Intelligence*, 78.
[21] Hinsley, *British Intelligence*, 37.
[22] Later Air Marshal Sir Victor Goddard – See *The Times*, Obituary, 23 January 1987.
[23] Air Marshal Sir Victor Goddard, *Epic Violet*, unpublished manuscript in Liddell Hart Military Archives, Kings College, London, 30-37.
[24] Wark, *Ultimate Enemy*, 236-240.
[25] The knock-out blow was the belief that the *Luftwaffe* would direct a potentially decisive bomber strike against London in the opening days of a war. See Uri Bialer, *The Shadow of the Bomber- the Fear of Air Attack and British Politics 1932-1939*, (London: Royal Historical Society, 1980).
[26] Hinsley, *British Intelligence*, 38. Goddard comments in *Epic Violet*, 'I will cite the belief, which I never held, that the war would begin with the devastation of London from the air. During 1938-39 I used to give a monthly lecture...at the CD College…I was required to lecture, not upon the probable employment of the GAF in war, but the…effects of a pre-supposed policy of employing the GAF exclusively upon the destruction of London…For I was debarred from giving any other option as more likely.'
[27] See TNA-AIR//40/221 – 15 August 1936 and 20-21 August 1936.
[28] TNA-AIR/40/219 – 1 August 1936.
[29] TNA-AIR/2/1688 – 23 February 1937.
[30] TNA-AIR/2/2022 – 17 March 1937.
[31] TNA-AIR/2/2022 – 22 March 1937.
[32] TNA-CAB/56/1- Minutes, 26 April 1937.
[33] Wark, 'Small Wars', 72.
[34] The Sub-Committee was to consist of Admiralty, War Office, Foreign Office and Air Raid Precautions (Home Office) members under Air Ministry Chairmanship.

[35] TNA-AIR/2/2022 - Joint Intelligence Committee (JIC) to AI3 20 May 1937 and TNA-CAB/56/5 – JIC Minutes, 3 March 1937.
[36] TNA-AIR/2/2022 - Minute 13, 27 May 1937.
[37] TNA-CAB/56/5 – JIC (S) Minutes 17 September 1937.
[38] TNA-CAB/56/5 – JIC (S) Minutes 17 September 1937.
[39] TNA-AIR/40/1487 – 8 November 1937
[40] See Jill Edwards *The British Government & The Spanish Civil War 1936-1939*, (London: Macmillan, 1979), 220-22 and AD Harvey, 'The Spanish Civil War as seen by British Officers', *Royal United Services Institute Journal*, Vol. 141, No.4, (1996), 65-67 and Wark, 'Small Wars', 73.
[41] TNA-AIR/40/1487 – 8 November 1937.
[42] TNA-AIR/40/1487-10 August 1938 and TNA-CAB 56/6 – 14 October 1938.
[43] See Wark, 'Small Wars', 67 and Bialer, *Fear of the Bomber*.
[44] TNA-WO/106/1587 - Notes on Nationalist Aragon Front by Wg Cdr A. James MP.
[45] TNA-CAB/53/8 COS 219th Meeting, 1.
[46] TNA-WO 106/1578 & 1579 detail Fuller's reports. Harvey, *Spanish Civil War by British Officers*, 65-67, covers many such visits.
[47] Wark, 'Small Wars', 72 and TNA-CAB 56/1 JIC(S) 8 July 1938.
[48] Brian Bridgeman, *The Flyers*, (Swindon: Brian Bridgeman, 1989).
[49] TNA-AIR/40/224 – 16 February 1937 – Report on service with Franco's air force by Mr W. D. Winterbotham. It contains highly accurate detail on Italian and German aircraft and weapons. The acting DDI comments, 'Any use to us? If not destroy'.
[50] Corum, 'Lessons Learned', 21. This suggests that little data on Spain was made available to the RAF.
[51] TNA-AIR/8/210, 219 and 252.
[52] TNA-CAB/56/1 JIC 15th Meeting Minutes – 25 April 1938.
[53] TNA-CAB/53/33 JIC 622 (1), JIC 623 (2) and JIC 624 (4).
[54] TNA-CAB/56/1 JIC 17th Meeting Minutes – 15 June 1938.
[55] TNA-CAB/56/1 JIC 11th Meeting Minutes– 6 October 1937.
[56] TNA-CAB/53/33 JIC 622.
[57] TNA-CAB/53/33 JIC 623.
[58] Wark, *Small Wars*, 75.
[59] TNA-CAB/53/33 JIC 624.
[60] TNA-AIR/40/218 – German Visit to RAF October 1937.
[61] TNA-AIR/2/2797 Goddard to DCAS – 15 April 1937. 'General Wenniger, the German Air Attaché, informed me that as a result of the air warfare in Spain which had largely been in co-operation with the Armies on both sides, German Army authorities have represented to the German Air Ministry (RLM), that air warfare in Spain has not developed along the lines they supposed it would in the next war. Although…there were obvious reasons for this, the RLM felt *compelled to keep the Army quiet* by allocating an increased number of reconnaissance squadrons to the Army.'
[62] Brian Bond, *British Military Policy between the Two World Wars* (Oxford: Oxford University Press, 1980), 255-258.
[63] TNA-CAB/53/8 COS Committee – Minutes of 219th Meeting of COS Sub-Committee of CID, 1.
[64] TNA-CAB/53/8 COS Committee, 6.
[65] TNA-CAB/53/8 COS Committee, 13. This is often misquoted. Newall was commenting upon the use of fighters to defend troops from ground-attack aircraft.
[66] Hinsley, *British Intelligence*, 37-38.
[67] Wark, 'Small Wars', 77.
[68] TNA-CAB/56/1 JIC 15th Meeting Minutes – 25 April 1938.
[69] TNA-CAB/JIC/66 – 3 June 1938.
[70] TNA-CAB/56/1 JIC 19th Meeting Minutes – 21 July 1938. The JIC(A) sat under Wg Cdr L. O. Brown.
[71] TNA-AIR/8/243 – 28 July 1938.

[72] TNA-AIR/8/243 – 28 July 1938.
[73] TNA-AIR/40/1487 – AI3 to FO – 10 October 1938.
[74] TNA-CAB/56/6 – JIC(A), 6th Meeting Minutes, 17 February 1939.
[75] Wark, *Ultimate Enemy*, 218-219.
[76] Wark, *Ultimate Enemy*, 220.
[77] Slessor, *Central Blue*, 210. '…the rather spasmodic incursions of the DCOS… tended to be a bit of a fifth wheel on the coach…it tended to produce insufficiently considered solutions…'.
[78] Wark, 'Small Wars', 82.
[79] TNA-CAB/54/2 DCOS 40th Meeting Minutes – 19 July 1939.
[80] TNA-CAB/54/6 DCOS 100, 4.
[81] Karl Ries and Hans Ring, *The Legion Condor* (West Chester, Pa.: Schiffer Publishing, 1992), 68. TNA-CAB 54/6 DCOS 104, Air Defence, 18, states that 'In the Aragon offensive of March-April 1938, at least 500 aircraft and probably more, were employed by the Nationalists in operations lasting five weeks.'
[82] TNA-CAB/54/6 DCOS 100, 21-23.
[83] Wark, 'Small Wars', 79.
[84] TNA-CAB/54/6 DCOS 101, 26.
[85] TNA-CAB/54/6 DCOS 101, 27.
[86] Wark, 'Small Wars', 80.
[87] TNA-CAB/54/6 DCOS 101,28.
[88] TNA-CAB/54/6 DCOS 104.
[89] TNA-CAB/54/6 DCOS 101, 28.
[90] TNA-CAB/54/6 DCOS 101, 10.
[91] TNA-CAB/54/6 DCOS 101, 21.
[92] TNA-CAB/54/6 DCOS 101, 31.
[93] TNA-AIR/41/39-AHB *Narrative on Bombing Offensive Versus Germany, Part 1: Preparation 1917-38*, 339-340.
[94] TNA-AIR/41/39, 340.
[95] Alvin D. Coox, 'Military Effectiveness of Armed Forces in the Interwar Period 1919-1941, in Allan R. Millett and Williamson Murray, *Military Effectiveness*, Vol. II: The Interwar Period (Winchester, Mass.: Allen and Unwin, 1988), 261-262.
[96] Corum, 'Lessons Learned', 318.
[97] Thomas H. Greer, *The Development of Air Doctrine in Army Air Arm*, (Maxwell AFB, Alabama: Air University, 1955), 87.
[98] Greer, *Air Doctrine*, 122.
[99] Earl F. Ziemke, 'The Soviet Armed Forces in the Interwar Period', in Allan R. Millett and Williamson Murray, *Military Effectiveness*, Vol. II: *The Interwar Period* (Winchester, Mass: Allen and Unwin, 1988), 16.
[100] Ziemke, 'Military Effectiveness', 17.
[101] John F. Coverdale, *Italian Intervention in the Spanish Civil War* (New Jersey: Princeton University Press, 1975), 410. Over 1,435 pilots and 764 aircraft served in Spain.
[102] Brian R. Sullivan, 'Fascist Italy's Military Involvement in the Spanish Civil War', Journal of Military History, Vol. 59, No. 4, Oct 1995, 724.
[103] Sullivan, 'Military Involvement', 720-721.
[104] James S. Corum, *The Luftwaffe: Creating the Operational Air War 1918-1940* (Kansas: University Press of Kansas, 1997), 219-223.
[105] Corum, 'Lessons Learned', 326-327.
[106] Manfred Messerschmidt, 'German Military Effectiveness 1918-1939', in Allan R. Millett and Williamson Murray, *Military Effectiveness*, Vol. II: *The Interwar Period* (Winchester, Mass.: Allen and Unwin, 1988), 247.
[107] Richard L. Proctor, *Hitler's Luftwaffe in the Spanish Civil War*, (Westport Ct.: Greenwood Press, 1983), 259.
[108] Proctor, *Hitler's Luftwaffe*, 261-263.
109 Corum, 'Lessons Learned', 331.
[110] TNA-AIR/8/243 – 11 August 1938.
[111] TNA-AIR/8/243 – 11 August 1938.
[112] Jones, *Beginnings*, 170.
[113] TNA-AIR/ 16/680 – The specifications created the Manchester, Lancaster, Stirling and Halifax.
[114] TNA-AIR/ 2/3233.
[115] TNA-AIR/8/243 - AI3-2 December 1937.
[116] TNA-AIR/16/832 – AI Report.
[117] TNA-AIR/2/3341 - AFC 13th Meeting – 2 January 1938.
[118] TNA-AIR/2/3341 – 25 January 1938.

[119] TNA-AIR/2/3345 – 14 October 1938.
[120] TNA-AIR/2/3233 – 2 January 1939. Me 109s received field-modified armour in August 1940.
[121] TNA-AIR/2/3345 – 9 October 1939.
[122] TNA-AIR/2/2073 – 9 June 1937.
[123] R. Wallace Clarke, *British Aircraft Armament*, Vol.1: RAF Gun Turrets from 1914 to the Present Day (London: Patrick Stephens, London), 61-62. See also TNA-AIR/14/380-9 August 1938.
[124] Clarke, *Aircraft Armament*, Vol.1, 61.
[125] TNA-AIR/8/210 – December 1936, 22-24.
[126] TNA-AIR/14/383 –22 April 1938.
[127] TNA-AIR/9/92 –22 July 1938.
[128] TNA-AIR/2/3043 – October 1939.
[129] TNA-AIR/9/79 – 20 March 1940.
[130] TNA-AIR/2/2073 – 9 June 1937.
[131] TNA-AIR/2/2613 – 1 February 1937.
[132] TNA-AIR/2/2073 – 9 June 1937.
[133] TNA-AIR/2/2073 – 9 June 1937, 3.
[134] Peter Lewis, The British Fighter since 1914 (London: Putnam, 1979), 62.
[135] TNA-AIR/2/2613 – 13 April 1939 and 25 June 1938. Only Dowding was sceptical about turret fighters.
[136] TNA-AIR/9/97–21 December 1938.
[137] Wing Commander J. C. Slessor, *Air Power and Armies* (Oxford: Oxford University Press, 1936).
[138] TNA-AIR/2/2190 – 8 February 1938.
[139] Terraine, *Right of Line*, 383.
[140] General Staff (Research) – Report for DCIGS No. 7, 'Considerations from the Wars in Spain and China with Regard to Certain Aspects of Army Policy' (Minley Manor: 31 March 1939).
[141] TNA-AIR/2/4130 – 6 June 1939.
[142] TNA-AIR/2/4229 – 2 December 1939.
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[144] Corum, 'Lessons Learned', 331.
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[146] Wark, 'Small Wars', 85.
[147] Goddard, *Epic Violet*, 36.