

**A warning from history:  
Integrating future visions of airpower into British seapower thinking  
during the interwar period**

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In 2020 the RAND Corporation published a study titled “The Future of Warfare in 2030”, which had begun in 2018. The study aimed to assist the US Air Force, Joint Forces, and the wider US defence strategy in preparing for future warfare through the use of predictions. Led by Dr Raphael S. Cohen, Director of the Strategy and Doctrine Program of RAND Project AIR FORCE, this book claimed that it “should be of value to the national security community [as it explains] how global trends will affect the conduct of warfare”.<sup>1</sup> However, prior to the start of chapter one, this ambitious goal is tempered. In the Summary the reader is provided with a first warning: “The U.S. track record for predicting the future of warfare is notoriously poor.”<sup>2</sup> A second one arrives in the form of a quote by the US Secretary of Defence Robert Gates in 2011 opens “Chapter One: The Future of Warfare”: “When it comes to predicting the nature and location of our next military engagements, since Vietnam, our record has been perfect. We have never once gotten it right [...]”<sup>3</sup> Most relevant of all is the third chapter, which is entirely dedicated to “The Failures of Forecasting the Future”. It is in here where the explanation for the reason why, “Perhaps no country has ever gotten the future of warfare entirely right”,<sup>4</sup> is provided:

“[...] poor predictions stem from failing to think holistically about the factors that drive changes in environment and their implications for warfare. Part of this, of course, comes down to how advances in technology might alter the way force can be employed on the battlefield.”<sup>5</sup>

To ensure “successful forecasting efforts”, it is necessary to consider various “different variables” such as “geographical changes”, “environmental changes”, “economic factors”, as well as “other factors—such as international laws, public opinion, and media coverage”. These factors “can constrain the way that states use force—and, consequently, how wars are fought. [Therefore] the inherent challenge in forecasting comes from trying to combine all these factors into a coherent picture of the future.”<sup>6</sup> The issue with this statement is the significant choosing of the word “challenge” instead of “success”. Additionally, “a coherent [and accurate] picture” of future warfare cannot guarantee a strategic advantage or at least not

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<sup>1</sup> Raphael S. Cohen et al., *The Future of Warfare in 2030: Project Overview and Conclusions* (Santa Monica: RAND, 2020), p. iv. Available online at [https://www.rand.org/pubs/research\\_reports/RR2849z1.html](https://www.rand.org/pubs/research_reports/RR2849z1.html). Accessed 22/01/2024.

<sup>2</sup> *Ibid.*, p. ix.

<sup>3</sup> *Ibid.*, p. 1.

<sup>4</sup> *Ibid.*, p. 6.

<sup>5</sup> *Ibid.*, p. 8.

<sup>6</sup> *Ibid.*, p. 9.

an advantage able to be maintained throughout a long conflict. Most importantly, because a picture is a fix image, while reality, on the contrary, and above all combat, is fluid and in a constant evolution.

The authors' failure to analyse historical cases may be due to the early recognition that prediction is an unreliable tool. Although they acknowledged the importance of numerous variables required to draw accurate visions of future strategy, these are absent from the examples used to illustrate partial success/failure predictions in the past. For instance, stating that “France bet with the Maginot Line” was a “miscalculation [that] contributed to the country’s defeat in a mere six weeks in May–June 1940”,<sup>7</sup> is only a small aspect of a larger picture that also includes the collapse of the British Expeditionary Forces, as well as those of Belgium and the Netherlands.

The failure to explain how the 1930s brought about political and public fear of a new war, resurrecting memories of large offensives along wide fronts and fuelled by mass conscription, deprives the reader of the necessary context to understand how defence policies developed. At the time, both the British and French armed forces felt the need to move away from strategies of endless inconclusive offensives. While France invested heavily on the creation of defensive positions to deter Germany from a new invasion and “spent over seven billion francs constructing the Maginot Line to shield the strategic industries of Lorraine between 1930 and 1937”,<sup>8</sup> Britain reinforced their views on the need for limited liability and aversion to the continental commitment following the failure of the Geneva’s Disarmament Conference in 1932. However, despite the end of the Ten Year Rule this year, the subsequent increase in British defence expenditure, “did not go far to fill the gaps of which the Chiefs of Staff had long been too uncomfortably aware.”<sup>9</sup>

It is interesting to mention that the determination of which 'gaps' to fill caused more problems than estimating how much to spend on the armed forces, so “once [policymaking] selected a defensive orientation, history began to be read and used in a particular way to justify or bolster the chosen policy or institution.”<sup>10</sup> This is a very important element for our discussion, especially when considering how much and for how long can any country with an updated defence policy reflecting today’s strategic context alter its defence budget based on future scenarios? For instance, some argue today that, “deploying enough of the new technologies to win a major war will require diverting an ever-larger share of limited budgets from a small number of high-cost “legacy” systems - manned aircraft, surface ships and so on - to larger swarms of relatively expendable unmanned sensors, attack drones and networked AIs.”<sup>11</sup> This argument may or may not prove true for future wars. However, as in the 1930s, it will undoubtedly leave armed forces less prepared for today's fighting. As occurred in Britain during the 1920s and 30s with regards to air and sea power, theories of warfare are today frequently and openly debated. However, specific military doctrines often regard novelty with varying degrees of scepticism.

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<sup>7</sup> *Ibid.*, p. 5.

<sup>8</sup> Martin S. Alexander, “The Fall of France, 1940”, *Journal of Strategic Studies*, Vol. 13, No. 1 (1990), p. 11. Also, Elizabeth Kier, *Imagining War: French and British Military Doctrines between the Wars* (Princeton, NJ: Princeton UP, 1997), p. 46.

<sup>9</sup> Michael Howard, *The Continental Commitment: The Dilemma of British Defence Policy in the Era of Two World Wars* (Harmondsworth: Penguin Pelican Books, 1974), p. 99.

<sup>10</sup> Kier, *op.cit.*, p. 46.

<sup>11</sup> Sydney J. Freedberg Jr., “Transforming the military for the AI age requires ‘a certain ruthlessness’”, *Breaking Defence*, <https://breakingdefense.com/2024/01/transforming-the-military-for-the-ai-age-requires-a-certain-ruthlessness-say-us-uk-experts/>. Accessed on 18/01/2024.

Early British airpower thinkers did not begin with spatial dimensions (length, width/breadth, and height/depth) as their main theoretical framework. In fact, much of it can hardly be described as theory; it was more a set of “Visions [as] ideas that could not survive systematic preparation for authentication.”<sup>12</sup> This is not to say that dimensional factors were not integrated into the thinking of the time. Like the ship, the aeroplane was seen as a tool operating in another dimension, and as such the theoretical construct of airpower in Britain was largely inspired by seapower in terms of the “special capabilities they have to offer and on the extent to which and the manner in which they operate alongside the other services.”<sup>13</sup> This can be seen in the 1916 book *Aircraft in Warfare: The Dawn of the Fourth Arm* by Frederick William Lanchester, a successful automotive engineer who was passionately interested in aviation. In this work he formulated the “N-square Law”, according to which, “the fighting strength of a force can be represented by the square of its numerical strength.” In particular, this law “had absolute qualities” in naval operations, “owing to the lack of variables.”<sup>14</sup> So if “variables” meant an environment with almost no geographical obstacles, then the aircraft was the perfect tool to maximise such an equation.

Airpower thinking was initially limited to supporting land and sea forces, particularly during the First World War. However, by the end of the war, the concept of 'air dominance/superiority' emerged as a new 'battlefield dimension'. For example, Lanchester argued that, “the [aircraft arm] secondary role [was] protecting these [surface] forces against other air forces.”<sup>15</sup> However, during the 1920s, it quickly transitioned towards ideas beyond the “third (air) dimension”, including the “strategic” and “morale” dimensions.

This transition was not a novel concept; it simply involved adapting airpower thinking to the late nineteenth-century strategic thinking of short and decisive wars. For instance, the Schlieffen Plan was based on the concept of overwhelming mass and speed directed against the enemy's main centre of population, government, and industry, as a means of achieving fast strategic decisiveness. Debates about the superiority of morale versus superior material forces have existed since technological developments in firepower challenged infantry mobility. The belief that air fleets had almost decisive power to cripple the enemy's morale, both at the front and at home, can be seen as a continuation of the pre-1914 military doctrine, albeit disguised as modern warfare. As early as November 1915, Lanchester had already realised that:

“It is futile to attempt to disguise the self-evident fact that a serious attack on the capital city of an enemy containing in its heart the administrative centre both of his Army and Navy in addition to the Headquarters of his Government, cannot be regarded other than a legitimate act of warfare.”<sup>16</sup>

Multi-dimensional warfare (or multi-domain as it is known today) was not what characterised early air power thinking. The primary concern was whether air power altered the principles of war, and to what degree it also altered the “nature” of land and sea warfare. For example, in 1927, naval journalist Hector Charles Baywater argued that while:

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<sup>12</sup> I.B. Holley Jr., “Reflections on the Search for Airpower Theory”, in USAF Col. Phillips S. Meilinger, ed., *The Paths of Heaven: The Evolution of Airpower Theory* (Maxwell AFB, Alabama: The School of Advanced Airpower Studies, Air University Press, 1997), p. 580.

<sup>13</sup> Geoffrey Till, *Seapower: A Guide for the Twenty-First Century* (London and NY: Routledge, 2013), p. 50.

<sup>14</sup> Robin Higham, *The Military Intellectuals in Britain, 1918-1939* (New Brunswick, NJ: Rutgers UP, 1966), p. 127.

<sup>15</sup> Higham, *op.cit.*, p. 127.

<sup>16</sup> *Ibid.*, p. 130.

“It was popularly supposed after the war that naval tactics had been revolutionised by submarines and aircraft. The truth is, however, that although new methods of attack had produced new methods of defence, the principles of sea warfare had undergone no fundamental change. [...] It is too early to judge whether air power is destined to negative [*sic*] the principles of naval strategy as now understood, but that they will have to be readjusted to meet the new conditions which have arisen is certain.”<sup>17</sup>

However, the acceptance of this “truth” was far from universal, explaining why airpower theory was as late as 1935 still far from being fully integrated within the land and sea warfare doctrines. Although the First World War (FWW) demonstrated the usefulness of the aircraft in multiple roles, such as collection of intelligence by air surveillance and reconnaissance, ground attack, the need for air superiority, and even long-range bomber raids; many still found it impossible not to see aircraft solely as another tool to increase the lethality of navies and armies. Years of harsh financial constraints following the traumatic and costly 1914-1918 experience, further exacerbated the struggle between the armed services for budget resources.

British advocates of airpower such as Lanchester, lawyer James M. Spaight, General Frederick Sykes, the organiser of the Royal Flying Corps, as well as Brigadier-General Percy R.C. Groves, Field Marshal Jan C. Smuts and Field Marshal Hugh Trenchard, believed that tactical experiences of the FWW were not enough to justify the RAF’s right to independence and growth. For many air officers the fact that the Army and the Royal Navy wanted their own air arms (to increase their efficiency, but also as an instrument to lessen its mutual dependence in war) felt threatening. The apparent RAF’s “lacked sense of historical investigation and retrospection” together with the “very power of Trenchard coupled with his enigmatic nature, the disproportionate glory assigned to the dogfighters of the [FWW], and the subsequent fight to save the independent air force, all seem to have overshadowed the way in which doctrine came to be created.”<sup>18</sup> Furthermore, as Elizabeth Kier argued, the interwar struggle for budget also “[helped] explain why some military organisations [became] dogmatically committed to their doctrinal orientation”.<sup>19</sup> These factors, taken together, would appear sufficient to explain the origins of the exaggerated expectations and unrealistic predictions of what (strategic) air power could achieve alone.

Statements from seapower thinkers also contributed to the development of sea and airpower theories as opposing concepts. For the Royal Navy (RN), air power theories were seen as a direct challenge to the old conception that naval supremacy guaranteed national security and survival. Airpower advocates questioned not only the Royal Navy’s vital role during war, but also the more subtle art of ‘gunboat’ diplomacy characterised by patience, bargaining, and signalling. While these qualities were favoured by the ‘slow’ sea domain, the air domain diluted the time response between threat and action, defence and offence. Air power also suggested that the Royal Navy was tactically too slow to seek out and destroy the enemy and strategically too slow to protect trade and the nation. Therefore, “Airmen argued, however,

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<sup>17</sup> Hector C. Baywater, *Navies and Nations: A Review of Naval Developments since the Great War* (London: Constable & Co. Ltd., 1927), pp. 10, 30. Available online at [https://babel.hathitrust.org/cgi/pt?id=uc1.\\$b16197&seq=24&q1=principles&start=1](https://babel.hathitrust.org/cgi/pt?id=uc1.$b16197&seq=24&q1=principles&start=1). Accessed on 10/01/2024.

<sup>18</sup> Higham, *op.cit.*, p. 131.

<sup>19</sup> Elizabeth Kier, *Imagining War: French and British Military Doctrines between the Wars* (Princeton, NJ: Princeton UP, 1997), p. 145.

that the new medium could apply such pressure far more comprehensively, directly, and quickly.”<sup>20</sup>

However, the evolution of air and sea power theories towards mutually exclusive positions was not one-sided. The passing of the notable naval thinker of the early twentieth century, Sir Julian Corbett, in September 1922 could not have come at a worse time. With “naval aviation and sub-surface operations [...] missing from Corbett’s theory of maritime strategy”;<sup>21</sup> British military thinking was left with no clear guidelines as to how the air factor should be integrated within naval strategy. What Corbett instead did was to alert his disciple Admiral Herbert Richmond about the prevalent idea within the Royal Navy of “crude Mahanism that going for the enemy’s battle fleet is the panacea for all strategic difficulties”;<sup>22</sup> an element which not only affected the type of naval procurement required, but also led many naval officers to view aircraft as a mere tool for locating the enemy's capital ships. He followed Corbett's advice and became “suspect of intellectualism” in the eyes of the Admiralty. According to Higham, his career was “finished” after his letters to *The Times* on 21 and 22 November 1929, “arguing once more against the materialistic Admiralty policy of big battleships and the numerical limitation of fleets”.<sup>23</sup> His approach to air power in the maritime environment also increased the number of his critics and reduced his influence on defence policy.

In 1934 Richmond still maintained that, “The object which sea power has to fulfil does not change [...]”.<sup>24</sup> After retiring in 1931 from the Royal Navy in 1931, he was recently appointed the Vere Harmsworth Professor of Naval History at Cambridge University. From this position, he meditated on the dangers arising from the public and political bitter controversy between air and sea power doctrines. The central issue was the notion that aerial attacks against the enemy’s “great centres of life and industry, the organisations of transport, water supply, and other internal national services, the administrative establishments and the civil population itself”, would render “weapon of blockade”, the naval most fundamental tool of pressure, completely unnecessary, or irrelevant at best, as air forces could attack an essentially static naval force.<sup>25</sup> Richmond believed that the argument claiming air power had rendered sea power, “a thing of the past [...], ineffective in offence, and impotent in defence”,<sup>26</sup> was an oversimplified side effect of the air power’s unrealistic capacity, “to overcome the will of the enemy people.”<sup>27</sup> He was instead convinced that aircraft was “an important new instrument of sea power [...] which will modify the conduct of the operations at sea as the steamship in her time, and the surface and submarine torpedo-boats in theirs, modified it.”<sup>28</sup> Despite cautioning against “dogmatic assertions either of the power of air flotilla in attack or of the strength of the defensive, [both] equally dangerous”, and that “man is so ingenious an animal that he finds a way of providing an antidote to most inventions”;<sup>29</sup> he failed to explore the

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<sup>20</sup> Col. Phillip S. Meilinger, “Trenchard, Slessor, and Royal Air Force Doctrine before World War II”, in Meilinger, ed., *op.cit.*, p. 41.

<sup>21</sup> J.J. Widen, *Theorist of Maritime Strategy: Sir Julian Corbett and his Contribution to Military and Naval Thought* (London and NY: Routledge, 2016), p. 157.

<sup>22</sup> *Ibid.*, p. 122.

<sup>23</sup> Higham, *op.cit.*, pp. 32, 34.

<sup>24</sup> Admiral Sir Herbert Richmond, *Sea Power in the Modern World* (London: G. Bell & Sons Ltd., 1934), p. 80.

<sup>25</sup> Richmond, *op.cit.*, p. 80.

<sup>26</sup> *Ibid.*, p. 101.

<sup>27</sup> *Ibid.*, p. 100.

<sup>28</sup> *Ibid.*, p. 106.

<sup>29</sup> *Ibid.*, p. 112.

origins of such dogmatism, but instead contributed to its growth by defending that airpower was, “a misnomer, aircraft being themselves instruments of sea power.”<sup>30</sup>

Framing the final objectives of airpower within a superior strategic and morale dimension hindered cooperation with the other two types of warfare. This approach explains why the three armed services struggled to establish a common doctrine and led to understanding 'collaboration' as 'subordination'. Such lack of progress in all-arms thinking would have seemed logical had the FWW not occurred. Paradoxically it did after the fast development of tactical airpower following a long four-year war. As early as 1923, Admiral Richmond in an article at the *Journal of the Royal United Services Institute*, left little doubt as to what he thought was the ideal relationship between the services:

“Co-operation [...] could be effective only when the purpose [a clear-cut and definable view of the national interest] was known and the supremacy of one Service decided upon so that money could be properly allocated. It was necessary to study defence as a whole in order to ascertain which arm would play the dominant role, as no country could afford to be supreme on land and at sea.”<sup>31</sup>

Anyone reading this would have understood that for Richmond the Royal Navy was the “one Service”, essentially because he saw the influence of “air flotillas” as being “measured by a more military standard, as [tactical] units of the sea forces”. Opinions such as these did little to create an environment in which arguments for the need for an independent RAF did not immediately clash with debates about the use of air power in naval and land warfare.<sup>32</sup> It was only natural for Trenchard to insist on the strategic potential of airpower. After all, “he said that in air warfare the moral effect was to the physical not in the old Napoleonic ratio of three to one but of twenty to one.”<sup>33</sup>

The departure of air power theory from its natural air domain not only produced fantasies of strategic decisiveness, it also linked “bombing” with a kind of “morale” dimension. The use of bombing against civilians as a strategy to break the enemy’s will to fight - and conversely, the need for a fearless and strong “home front morale” to withstand the enemy’s air offensive - was thus well anchored in the airpower visions of the early 1920s. As Henry Albert Jones wrote in the introduction to the first volume of his series *The War in the Air* (1922):

“The air war becomes a test of nervous endurance. The nation which keeps a stiff upper lip, and whose air service adheres to its determined offensive, of course will, in the end, secure the greatest measure of protection from the air for all its various activities.”<sup>34</sup>

The “morale” debate was an old one, and therefore well known to the general public audience and political circles. According to Echevarria, “London's Zeppelinitis” was already a perfect example of how the press and the wider literature had exploited such a possibility well before 1914. As early as 1908, Major Bannerman-Phillips, “Britain's foremost military commentator on aviation matters”, warned the public against “the irresponsible utterances of chauvinists,

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<sup>30</sup> *Ibid.*, p. 117.

<sup>31</sup> Higham, *op.cit.*, p. 33.

<sup>32</sup> Richmond, *op.cit.*, p. 117.

<sup>33</sup> Higham, *op.cit.*, p. 164.

<sup>34</sup> Higham, *op.cit.*, p. 140.

enthusiasts, and panic mongers."<sup>35</sup> The “fear of the bomber” was even more justified after the FWW: everyone knew that urban centres would be targeted if war broke out; although the political exploitation of fear was one thing, and how RAF officers reacted to such possibility was quite another. In any case, both of them found in the deterrence argument a common ground for agreement: to provide the public with political reassurances of future security, and to increase the resources and budget of the Air Ministry and the RAF.

Little could Winston Churchill, recently appointed Secretary of State for both War and Air following Prime Minister Lloyd George’s victory in the late 1918 election, have foreseen that his decision to remove Major General Frederick Sykes in favour of Trenchard as the new Chief of the Air Staff, would consolidate the growing discontent between the three services over the air question. Although at first Trenchard did not ignore the fact that, “there will be a small part of [the Air Service] specially trained for work with the Navy [and] the Army, these two small portions probably becoming, in the future, an arm of the older services”, in his famous “Memorandum” of November 1919 he also hoped that, “the Independent Air Force, will grow larger and larger, and become more and more the predominating factor in all types of warfare.”<sup>36</sup> Meanwhile, Trenchard’s main need was for training facilities to expand the cadre of junior officers, 50 per cent of whom would have to be “obtained on short service commissions or by the seconding of officers from the Army and Navy.”<sup>37</sup> Even when he argued that, “an interchange of officers is bound to make for closer and more intelligent co-operation between the services”, this could hardly sound sincere, given his expectations of achieving superiority in all “types of warfare”.

In his 1990 book *The Future of Sea Power*, Eric Grove defined sea power as, “that form of military power that is deployed at or from the sea.” Such a simple definition was formulated to avoid the pernicious effects of “an almost mystical concept, a magic formula to be mouthed in awestruck tones to scare away evil spirits such as defence ministers with non-naval priorities or air force officers with alternative means of providing a state’s military power on or across the oceans.”<sup>38</sup> This paragraph highlighted one of the most symptomatic problems that has persisted since the 1920s: the use of technological developments in airpower to exclude land and sea from providing “alternative [political] means”. The rapid development of the aircraft industry during the 1920s and 1930s helped to convince many that the decline of naval supremacy had started. Year after year, air races demonstrated the aviation industry’s amazing ability to produce machines with seemingly endless range, speed, altitude and endurance. This was evidence enough for some to easily argue that the need for a large navy seemed superfluous. Air power seemed to promise military and political leaders with unlimited flexibility, reach, and rapid delivery of military power.

If balancing technological innovation with national security, strategy, doctrine, and military culture was difficult enough with only two services, the consolidation and expansion of the RAF made things even more complicated. This culminated in the “air panic” of late 1934 and early 1935, “particularly after the May 1935 RAF expansion – the third such in less than a

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<sup>35</sup> Antulio Echevarria, *Imagining Future War: The West’s Technological Revolution and Visions of War to Come, 1880-1914* (Westport, Connecticut, and London: Praeger Security Int., 2007), p. 91.

<sup>36</sup> H.M. Trenchard, “Memorandum by the Chief of the Air Staff”, *Royal Air Force: Permanent Organisation of the Royal Air Force, Cmd. 467* (London: HMSO, 1919), p. 1.  
<https://archive.org/details/PermanentOrganizationOfTheRoyalAirForce1919/page/n1/mode/2up?view=theater&q=warfare>. Accessed on 15/01/2024.

<sup>37</sup> *Ibid.*, p. 5.

<sup>38</sup> Eric Grove, *The Future of Sea Power* (London: Routledge, 1990), p. 3. My emphasis.



year, none of which were announced as part of the annual Air Estimates, as was usual.”<sup>39</sup> Interestingly enough, this situation was similar to that described by Hew Strachan in his chapter “Underwriting Innovation: Maritime Strategy and Geopolitics”:

“Maritime strategies since 1990 [...] have locked themselves into two narratives. First, generalizations about the sea, [...] self-evident truths that are incapable of being translated into sets of specific choices. Second, a focus on capabilities and hull numbers [that] tends to see those ships as ends in themselves rather than as means to an end. Strategy lies in the space in between these two points. The armies and air forces of western states have endeavoured to connect them by stressing the operational level of war. This has not necessarily worked [given some] narratives of tactical and operational success [followed by] political failure. [But] at least, however, these services are part of the strategic discussion; navies are not.”<sup>40</sup>

If we were to substitute “maritime” and “navies” with “airpower” and “air force”, and “1990” with “1935”, we would have a concise summary of what was not functioning: Airpower aimed to exclude the other services from the strategic discussion. The integration of aircraft technology within the doctrines of the three services was not simply a matter of recalling lessons from the last Great War. It involved many aspects, some of which irresolvable (precision bombing) - at least not until new technology emerged to fill the gaps. However, strategic discussions should have been supported by strengthening an all-arms operational approach. Unfortunately, these discussions were replaced by mutual distrust and ignorance of each service's capabilities and possibilities. Additionally, there was an over focus on capabilities (either real or imagined) and hull and bomber numbers.

Determining “what early predictions actually work and what not” remains one of the most challenging tasks for any period between wars. In his 1977 foreword to Bryan Raft's *Technical Change and British Naval Policy, 1860-1939*, Professor Sir Laurence Woodward Martin acknowledged this difficulty when he wrote:

“In our age, an accurate appreciation of the relationship of technological change to strategy is perhaps the essential basis of national security. The significance of technical developments must be anticipated and not, as so often in the past, left to be uncovered in the early surprises of the next war. Yet, if anticipation has become essential, it has not become any easier.”<sup>41</sup>

Given that “anticipation” is defined by the Oxford Dictionary as, “the fact of seeing that something might happen in the future and perhaps doing something about it now”, Professor Martin seemed to suggest that “the problem of strategic adaptation to change” might be solved, at least to some extent, by predicting the future effects of technological developments.

In the context of the final years of the 1930s, the decision to divert expenditure from bombers to fighters and air defence could be cited as one of the few "predictions" that worked - while others, such as the lack of training and co-operation with the Army for Close Air Support

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<sup>39</sup> Brett Holman, “The Air Panic of 1935: British Press Opinion between Disarmament and Rearmament”, *The Journal of Contemporary History*, Vol. 46, No. 2 (2011), p. 305.

<sup>40</sup> Hew Strachan, “Underwriting Innovation: Maritime Strategy and Geopolitics”, in Alessio Patalano and James A. Russell, eds., *Maritime Strategy and Naval Innovation: Technology, Bureaucracy, and the Problem of Change in the Age of Competition* (Annapolis: Naval Institute Press, 2021), p. 25.

<sup>41</sup> Lawrence W. Martin, “Foreword”, in Bryan Raft, ed., *Technical Change and British Naval Policy, 1860-1939* (London and Edinburgh: Hodder and Stoughton, 1977), p. vii.



(CAS), and the idea that bombers did not need fighter escorts for daylight bombing, were proved wrong at great cost. Other illustrative predictions were those made by Brigadier Groves in his 1935 reissue of his 1922 book *Our Future in the Air*: “[...] wrong that long-range fighters would not prove useful, wrong [that] enemy fighters should not be destroyed in favour of other targets along the way, wrong that the only way to win a war is to attack the people themselves, and wrong that anti-aircraft would be inconsequential.”<sup>42</sup> Such criticism was not fair, however, as most commentators, politicians and officers had imperfect and incomplete (secret) information, such as defensive radar experiments. And while many military officers regarded “uncritical loyalty to senior officers”,<sup>43</sup> as a basic requirement for command; others, such as the future Commander of the Coastal Command, Air Marshal John Slessor, when appointed Deputy Director of Plans at the Air Ministry in May 1937, “readily confessed that he was quite ignorant about machinery [...], never piloted a modern aircraft, and he had no knowledge of the aeronautical revolution of the mid-1930s. He was an able theorist [...] but he knew nothing about the actual condition of the operational or training commands.”<sup>44</sup> This means that while Professor Martin was right to think that “slowness to adapt to technical change is frequently the result not of refusal to face up the problem but to its inherent intellectual difficulty”,<sup>45</sup> there was also a shortage of suitably qualified and experienced commanders capable of challenging some of the Air Staff’s “articles of faith [such as] that the [air] counter-offensive was vital.”<sup>46</sup>

During the interwar period, sea and airpower differed markedly in their approach to technology. While the former adapted new technology to an existing naval strategy, the latter used it to create a new, untested strategy. In May 1936, Churchill shared with Admiral Ernle M. Chatfield, the First Sea Lord and Chief of the Naval Staff, an idea that could apply to any armed service concerned with the air threat: “What you have got to prove is that the Admiralty of the future will be able to construct vessels so immune from these [air weapon] risks.”<sup>47</sup> It is unclear how distant he imagined this future to be or the extent of such immunity. Although, if he had foreseen the significant evolution that air power would undergo in just one decade, he would not have expressed such an unrealistic desire. This is a perfect example of how exaggerated potentialities of air power were extended and internalised throughout British society.

The development of doctrine for new technologies in peacetime should take a conservative approach, traditionally achieved through a process of trial and error. However, airpower strategy did not develop in the same way before the Second World War. National strategy was directly influenced by technological advances without the need for war, extensive experimentation in realistic conditions or the study of foreign conflicts. Air theory, teaching, doctrine and policy were based on self-fulfilling visions, without sufficient consideration of the observation of air warfare during the Spanish Civil War, which was dismissed as a minor conflict.

In 1996, Col. Meilinger stated that, “Airpower is not widely understood [and] the basic concepts that define and govern airpower remain obscure to many people, even to professional military officers.”<sup>48</sup> After a long period of nuclear deterrence, during which the

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<sup>42</sup> Higham, *op.cit.*, p. 191.

<sup>43</sup> Vincent Orange, *Slessor: Bomber Champion* (London: Grub Street, 2006), p. 48.

<sup>44</sup> *Ibid.*

<sup>45</sup> Martin, in Bryan Ranft, *op.cit.*, p. vii.

<sup>46</sup> Orange, *op.cit.*, p. 49.

<sup>47</sup> Geoffrey Till, “Airpower and the battlefield”, in Bryan Ranft, ed., *op.cit.*, p. 110.

<sup>48</sup> Meilinger, “Introduction”, *op.cit.*, p. xi.

strategic theory of airpower was almost reduced to a mere schedule for the delivery of nuclear weapons, this would seem a logical outcome. In the 1990s and beyond, however, airpower made a comeback and became the preferred instrument of governments. But unlike a hundred years earlier, as Lanchester wrote in 1915, “the power of reprisal and the knowledge that the means exist will ever be a far greater deterrent than any pseudo-legal document.”<sup>49</sup> As such, this argument would not work until the advent of thermonuclear devices promising Mutually Assured Destruction (MAD). However, the potential use of any non-nuclear air weapon would not be conditioned by any deterrent factor. Thus, while nuclear deterrence, regardless of its technological evolution, facilitated prediction at the strategic level, the continuing sophistication of conventional air weapons did not. As a result, and similar to the interwar period, "anticipation" as a tool for military and political leaders to better prepare armed forces for the next war remains a high-risk option. Furthermore, it also highlights the dangers of pursuing and compartmentalising strategic and tactical doctrines based solely on novel weapons technology.

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<sup>49</sup> Higham, *op.cit.*, p. 131