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‘A Matter of Opinion’: British Attempts to Assess the Attrition of German Manpower, 1915-1917

LOUIS HALEWOOD¹

ABSTRACT Revisionist historians of the Western Front have demonstrated that Britain had no alternative but to wage a war of attrition to defeat Germany. However, the effort to assess this process has been neglected in the historiography. This article explores British attempts to gauge the success of their strategy of wearing down German manpower. Efforts in London proved unable to supply a convincing answer. Using General Headquarters’ dubious estimates from the front, Field Marshal Sir Douglas Haig argued that his strategy was working. Prime Minister David Lloyd George’s inability to confound these estimates shaped his decision to permit the Passchendaele offensive.

INTRODUCTION

Assessing the manpower resources of an enemy state in war, and the attrition inflicted upon it, is a challenging form of strategic assessment. Producing an accurate answer requires significant quantities of detailed and accurate intelligence, which is hard to find. Low-grade sources are unlikely to produce material of the required accuracy and specificity, which even high-level penetration may fail to gather, for the states under assessment may not know the

answers themselves. This article explores the efforts of the British government to assess the manpower of Germany, and its casualties, during the First World War. More specifically it analyzes the attempts of the Enemy Personnel Committee, a sub-committee of the Committee of Imperial Defence (CID) comprised of statisticians, intelligence, and operations staff, to solve this problem.² Limits to sources produced an intelligence lacuna, forcing these people to rely on comparative methods and extrapolation from unreliable data, so producing estimates of dubious power. This reduced the value of their work to strategy-makers. This failure showed only that no reasoned answers could be found to these questions, which shaped the strategic debate in 1917 between the politicians, disenchanted with the strategy of attrition, and the generals, who insisted that it was working in Britain's favor. While unable to solve the problem either, Field Marshal Sir Douglas Haig, commander-in-chief of the British Expeditionary Force (BEF), confidently used his headquarters' assessments of these issues to make his case for a major offensive in 1917. His confidence amidst the ignorance and uncertainty among other military and civilian decision-makers marked the launching of the Passchendaele offensive.³

The perceived British tradition of warfare in the 18th and 19th centuries, referred to as 'business as usual', had focused on waging a largely maritime contest while financing the large armies of continental allies. Such a strategy exploited Britain's superiority at sea to cripple continental foes economically by disrupting trade and seizing colonies. Wars therefore were won without significant costs in manpower, and territorial prizes proffered resources which augmented Britain's position.⁴ The challenge presented by the Central Powers rapidly put paid to notions in London of conducting a 'business as usual' strategy by the end of 1914, however. While the Royal Navy would play a pivotal role in enabling the Entente powers to exploit their global resources and isolate the Central Powers via blockade, Britain also would need to raise a large continental army to support its allies, France and Russia, in a lengthy

war.⁵ Victory would turn on the destruction of the German army and its reserves, the center of gravity for the Central Powers.⁶ The strategy undertaken to achieve this end was attrition. Meanings of attrition varied at different times, but all required a large mobilization at home and the ultimate destruction of the German Army.⁷ In 1914 and into early 1915 Lord Kitchener, the Secretary of State for War, understood better than most that this would be a long war, and set about raising 'New Armies' composed of volunteers.⁸ In the meantime he believed that the destruction of the enemy in battle was a distant objective, and it would be preferable for Britain to switch its attention to more immediately promising theaters. For now, attrition would take place on the Western Front in the form of 'limited operations to grind down enemy strength or to repel German offensives'.⁹

By the middle of 1915, both sides accepted 'the inexorable of the logic of the war': prolonged attrition was the only way to force a decision.¹⁰ In 1916, Kitchener and General Sir William Robertson, Chief of the Imperial General Staff (CIGS), were certain that a combined attritional offensive with the French army on the Western Front was essential to defeating Germany, and ensuring the continued survival of the Entente.¹¹ The result was the Battle of the Somme. The heavy losses here caused David Lloyd George, Prime Minister from December 1916 onward, to seek alternatives to this costly wearing down process. However, there was no other option which promised victory: the German army must be destroyed in battle in order to win the war. The three great attritional battles of 1916 and 1917, the Somme, Arras, and Third Ypres, were part of 'an essential process of wearing out the enemy', and contributed to Germany's ultimate collapse in 1918 following the failure of the German Spring Offensive and the Allies' Hundred Days Offensive.¹² This strategy of attrition imposed new demands on the British state, including the assessment of its own and enemy resources. Scholars largely have ignored this intelligence aspect of the grinding down of the Central Powers on all fronts. However, understanding whether a strategy is working is crucial to the

conduct of any war. By examining these efforts to assess attrition, this article seeks to illuminate the problems of strategic intelligence in a war of attrition, which states face even today.

This article also addresses an overlooked realm of civil-military friction in London at this time. The high-level civil-military clashes which occurred throughout the war over issues such as command and Allied co-operation – notably at the start of Lloyd George’s tenure as Prime Minister – are well-documented in the historiography.¹³ Yet assessing attrition rapidly became a battlefield of its own between professional soldiers and civilian experts, over both sources and methods utilized by the civilians, and the right of army intelligence to produce independent assessment, which was exercised at the front by Haig.¹⁴ This study focuses on the efforts to examine Germany, rather than Austria-Hungary, Bulgaria, and the Ottoman Empire, which the committee treated in less detail. Britain recognized that Germany was the most important of the Central Powers, for which it had greater facilities ‘for acquiring and testing information’.¹⁵ Lastly, the archival sources lack proceedings for 60% of the committee’s meetings.

1914-15: THE FIRST EFFORTS

The bid to assess manpower and attrition began once it became apparent that the war would be a long slog. Throughout 1915, both sides increasingly saw ‘that this was a war of resources, and in particular of reserves’, which only could be won through the mobilization of ‘all society’s resources and grinding down the enemy’s capacity and will to fight in a sustained war of attrition’.¹⁶ Even a leading critic of the strategy of attrition, Winston Churchill, agreed in late 1915 that it was unavoidable. However, London needed to answer

two critical questions if such a strategy was to be pursued effectively. The first was how many men Germany could put into the field. The second was how many men Germany had lost thus far.

Britain had a number of sources on these issues, primarily open ones. For the problem of total mobilizable manpower, the key source was the most recent census of Germany, conducted in 1910. As the United States (US) Army later pointed out, this census was of limited value as it required extrapolation to update its figures for the start of the war. Any error in the assumption of how the population had developed in the intervening four years up to 1914 would make the base figure of manpower calculations inaccurate, producing problems which could not be rectified once hostilities had begun.¹⁷ The main sources for German losses were casualty lists published almost daily by Germany for the different armies of Prussia, Bavaria, Saxony, and Wurtemberg.¹⁸ They provided information on casualties, initially in detail down to the location of wounds. Such a wealth of information raised suspicions, especially among professional soldiers. Doubters often cited deception as a reason to ignore the lists, holding that the Germans deliberately under-reported losses so to uphold morale at home. Yet even if the lists were genuine, whether the Germans could accurately record their own casualties in this conflict of unprecedented scale was unclear. Other open sources, mostly in the form of German and Austrian press reports, magazines, Trades Unions year-books, and parish statistics, offered lists on the status of local soldiers – principally indicating whether they had become a casualty. But these sources were limited in their sample, forcing statisticians to extrapolate these figures to a wider population – posing problems if the sample proved anomalous.¹⁹

Several closed sources provided useful intelligence on manpower and attrition. Prisoners of war (POWs) could be useful even if uncooperative: their mere age and physical condition illustrated the quality of manpower in the German army. Moreover, they often were

caught with *Soldbucher* (pay books) that listed roll call numbers, which indicated the number of replacement they represented in a company, providing evidence of how much attrition had been inflicted on that unit. Intercepted letters sent to POWs in England illuminated recruiting policies in Germany. But these sources similarly provided only small samples and could also be anomalous – some ‘unfit’ Germans may well have found a uniform regardless of recruiting standards, which varied from one part of the country to another. Secret service agents were better at providing strategic than operational-level intelligence, but still failed on this point; ‘the true state of German reserves was also marked by a continual absence of agent reporting’.²⁰

Using combinations of these sources, the British sought to assess German manpower. The first efforts occurred over the winter of 1914-15. This work was undertaken by eminent figures such as Lord Haldane, who was Lord Chancellor and a senior minister involved in the direction of the war, having helped to create the modern British Army while serving as Secretary of War in previous years.²¹ Also involved was Charles Oman, a prominent military historian.²² Despite this, these estimates were lackadaisical and politicized.²³ Seeking to ease his colleagues’ restlessness for action so that he might keep his expanding army out of the firing line until the time arrived to wreck the remnants of the German army, Kitchener²⁴ ordered Charles Callwell, Director of Military Operations,²⁵ ‘to prove that the Germans will run out of men within the next few months’.²⁶ Callwell made dubious calculations to show that the Allies had greater reserves, and victory was only a matter of time. He and Kitchener knew that his conclusions were nonsense, Callwell claiming that he was ‘graded in the “doubting Thomas” class’ regarding such mathematical exercises, and that he could have argued the opposite case with ease.²⁷

Others worked tirelessly throughout 1915 to answer these questions. Their approach matured and became more professional, rooted in more realistic methodologies than

Callwell's assumptions. Yet the problem still could not be solved. These more rigorous efforts provoked new questions and hit a significant barrier: could the German casualty lists, the critical source of data on attrition, be trusted? Civilian experts, familiar with statistics, and professional soldiers, familiar with the front, weighed in this issue, ultimately on opposite sides. The civilians wanted to believe the lists were genuine, perhaps because if so they would be tremendously useful. The soldiers wanted to prove them a German lie, for the lists were unpleasant reading to officers who believed that the opening year of the war must have been harder on the Germans than the allies.

S. J. H. W. Allin of the National Insurance Commission argued that the lists were not a German deception.²⁸ General George Macdonogh, soon to become Director of Military Intelligence (DMI), claimed the opposite, citing the lack of clear ordering of casualties.²⁹ He preferred to examine figures from trade unions and parish magazines, interpreted through analogies of British and French losses, which produced far higher estimates.³⁰ Sir Claud Schuster, Permanent Secretary to the Lord Chancellor's Office, challenged these sources, which were too eccentric and small a sample to be relied on. While the lists gave only a minimum figure, they had not been falsified.³¹

Modern technology seemed a means to solve the problem of the disorganized lists which Macdonogh cited. The Civil Service had insufficient tabulating machines for this purpose, but the Prudential Assurance Company had installed the largest battery of punch card machines on earth in 1914.³² It offered assistance 'in the most patriotic spirit', and bore the cost of the staff sent to help with this endeavour.³³ The Powers mechanical tabulating machines were highly advanced technology which recorded data on special cards. One card was used per casualty. Data was recorded on each card by punching holes in categories to indicate the nature of casualty, month of report, month of damage sustained, rank of man, class of man, regiment, whether Bavarian Regiment or not, and whether he belonged to an

ordinary or an Ersatz battalion. 300 of these cards could be punched per hour, sorted to produce information such as the number of casualties reported each month, divided according to rank. This effort was one of the earliest applications of data processing machines to intelligence analysis.³⁴ In technical terms it was successful. It reduced the scale of the problem, yet could not eliminate it because of the limits to the quality of the data.

This quantitative work was augmented by expert analysts, including Allin and Mr. Hall of the Military Enquiries Section of the Official Press Bureau.³⁵ Their analysis revealed some surprises, such as fewer than 5% of the deaths being from sickness, meaning that a great traditional killer in war suddenly was marginalized. It also showed a trend of reduced German reporting on casualties from January onwards. Hall explained this tendency away as simply reflecting belated reporting: the early winter months were high in casualties as they contained late reports of losses suffered during the opening months of open warfare. In sum, ‘the study of the lists increases one’s belief in them’. Even if they seemed low, the ‘safer view to adopt’ was that the lists were honest, instead of over-estimating German losses. Using the figures available from Prudential, Hall combined the records on manpower and attrition to make a forecast: the third year of war would be the time when Germany felt the strain of attrition – and if the lists are doctored ‘the catastrophe will come all the sooner’.³⁶ This conclusion was remarkably accurate, but Hall’s methods of deducing the manpower of Germany were simplistic, and his figures fairly imprecise.

Despite Prudential’s work, the matter was not settled. Oman claimed that POWs were under-reported, but after a fresh inquiry Schuster demonstrated that Oman was exaggerating, and suspended further investigation on this case.³⁷ Oman had been too hasty, but so was Schuster. In the following week he noted the appearance of entries of *bisicher nicht gemeldet* (not previously reported). If the Germans had not published details of every missing soldier, Schuster’s stance was threatened.³⁸ Yet even if the lists were trusted, many challenges

remained, for example ‘we do not know the number of wounded who return to service’.³⁹

Allin proposed a solution which used British figures and a comparative methodology, but recognized that it too was ‘problematical’.

These analysts had little solid information, and spent their time arguing about the reliability of one source largely because they had no better. Nevertheless, those in favor of the lists’ authenticity dominated in 1915.⁴⁰ Still, Allin pessimistically mused, it is ‘impossible to make any definite estimate’ on total mobilizable manpower – ‘every statistician must form his own conclusion’.⁴¹ Even more, he accepted French estimates that future German losses would average only around 100,000 men per month, meaning that ‘too much must not be expected from attrition’.⁴² Allin was trying to assess the issue through a scientific approach, but the inability to answer fundamental questions about manpower and attrition meant that these findings could not be applied to strategy, the reason for the investigation in the first place.

1916: THE ENEMY PERSONNEL COMMITTEE

Strategic assessment of Germany was not contained within the corridors of power. As the war ground on, newspapers made their own estimates. On 9 February 1916, *The Times* correctly defined the scale of the problem: only the Germans might have the means for exact calculation, while ‘the dim twilight’ of war would hinder the allies’ work. There was too little intelligence to offer accuracy; ‘the best estimate can only be an approximation to the truth’.⁴³ Still, Whitehall set out to answer these questions about manpower and attrition, spurred by necessity, for ‘by 1916 warfare had become a matter of calculation – of manpower resources... of how many casualties and prisoners it would take to break the enemy once and

for all'.⁴⁴ The BEF soon would make its first great effort on the Somme, whereas the French army already was under mounting pressure from February 1916, bearing the brunt of Germany's main effort for the year in the Battle of Verdun.⁴⁵

On 10 May 1916 the War Committee established a secret⁴⁶ sub-committee of the CID, the Enemy Personnel Committee (EPC) 'to examine and report on the probable resources of the enemy in *personnel* at the present stage of the war'.⁴⁷ This act was the first serious, organized bid to solve that problem. Instead of prolonged debate about the reliability of the lists, co-operation was encouraged. This aim was reflected in the composition of the committee: Sir Bernard Mallet, the Registrar-General, was made chairman, supported by civilian experts Dr. John Brownlee, Dr. T. H. C. Stevenson, and A. W. Flux from the Board of Trade. He would also be joined by military experts: Captain Edgar William Cox, of the Imperial General Staff, was Macdonogh's protégé and a man soon to rise to the top of British Army intelligence.⁴⁸ He was joined by Major C. L. Storr, Assistant Secretary of the CID.⁴⁹ Yet better organisation would not reduce the intelligence lacuna and the reliance on the same limited sources, nor were efforts made systematically to exploit material acquired by the British Army in France.

The committee addressed two interlinked but distinct questions. Manpower had received scant attention the previous year, but if the committee did not understand how many Germans could enter the field, their losses would be an isolated fact. In 1915, Brownlee was one of few students of this issue. Based upon the 1910 Census, and extrapolations from it, particularly via the use of life tables for Germany and death rates in peacetime Germany, his report was one of the first documents submitted to the EPC. It gave figures of 17,000,000 men in Germany during 1914. Brownlee removed the number of men unfit for military service from this figure, relying on French experience and comparison with a small sample in the journal *Deutsche Medicinische Wochenschrift*, which gave answers over one million men

apart. In order to solve the next problem, the number of men retained in industry, Brownlee extrapolated from the Industrial Censuses of 1895 and 1907, assuming that the change in age distribution had continued uniformly – something he could not be sure of.⁵⁰ These methods left ample room for mistake from the start. Schuster was ‘highly distrustful of Brownlee’s methods’, claiming he ‘moves about in a world of his own’.⁵¹ As such, in its first meeting on 15 May 1916, the committee asked Brownlee to reassess the issue of manpower.⁵² Unfortunately for the committee, the methods of 1915 had not advanced: the sources available simply could not provide a better answer.

The committee concluded that manpower could be estimated only by determining the number of males of military age and then deducting those unavailable to serve – as Brownlee had done. The assessment of physical unfitness must rely on the experience of what ‘another nation has done under similar circumstances’ – i.e. France. Deductions for industrial requirements could ‘only be guessed at, if argued on the intrinsic probabilities in view of the circumstances of each industry’.⁵³ Small samples produced from German newspapers or POWs might be anomalous. Thus, again, the experience of France offered the best model. Therefore, in essence Brownlee had already submitted as useful a report as possible. This realisation fuelled the doubts which grew steadily throughout this process.

Brownlee, Mallet, Cox, and Flux were asked to establish total manpower via the Returns of the German Registrar General, with deductions of manpower rooted in comparisons with Britain and France.⁵⁴ Despite being a state with a conscription system of comparable size, the French comparison presented further problems: on the same day that the committee requested these estimates, Cox received a French document translated by the War Office which outlined the French method of deducing German manpower. The French admitted that they could not precisely determine how many men they had drafted into their own army since the war began.⁵⁵ Similarly, the EPC asked Flux to assess British manpower –

‘if it is found *possible* to do so’.⁵⁶ The portents for assessing Germany were poor if the Entente powers could not assess themselves.⁵⁷

Nevertheless, at its second meeting on 29 May, the EPC agreed that Germany could be assessed only through a proportional comparison with France, especially because, according to Flux, Germany required even more men in industry due to its isolation via blockade. The value of alternative sources also was debated. Flux dismissed Trade Union statistics, believing the percentages of mobilization they displayed were ‘so high as to make it doubtful what inference could be properly drawn’.⁵⁸ Debate raged, meanwhile, about data on the mobilization of German railway staff. Brownlee held ‘that the railways and telegraphs were staffed by men past fighting’; Storr retorted that signalling work required men of ‘considerable strength and fitness’.⁵⁹ Both claims were supposition, demonstrating the limits to British knowledge. This incident at least demonstrated the benefits of working in a committee – such debates could occur rapidly rather than be prolonged over months of reports and replies.

The final discussion over manpower was the examination of Hilaire Belloc, a noted Anglo-French writer who had published his own strategic assessments of Germany in *Land & Water* since the war began.⁶⁰ He had gained a reputation as an ‘expert’ on the matter, which the committee took seriously. The men at the front held a different view, and the trench newspaper *The Wipers Times* mocked him via spoof estimates written by a ‘Belary Helloc’.⁶¹ Belloc held that a nation could mobilize between 10-13% of its total population in the first two years of hostilities. Belloc claimed that 8.5 million German men were mobilizable – under 13% of its population, without accounting for the requirements of industry.⁶² Before the committee, however, Belloc ‘disclaimed any special information’, and these views were challenged. Cox discredited Belloc’s belief that the 1889 class had not been mobilized; Belloc accepted Stevenson’s analysis that 13% mobilization was possible for a rapidly

increasing population. Belloc agreed that the deductions for men remaining in industry was ‘a question for experts’ – and he was not one. After being queried by Cox on the yield from the new classes, Belloc increased his figure for mobilizable men to 9 million, after deducting industrial requirements but including classes of men reaching fighting age.⁶³ The mere fact that the EPC questioned Belloc, even calling him ‘skilled in the matter’ of assessing attrition, demonstrates their paucity of knowledge.⁶⁴ An amateur making unfounded estimates thus deserved attention, because little else was at hand, though admittedly Belloc may have done as well as possible with publicly available sources.

Flux, Brownlee, and Stevenson were tasked with producing a final statement on manpower. Their report was completed on 26 June. They relied largely on the experience of France and the 1910 Census, with figures extrapolated to December 1915, so to determine the number of mobilizable men had peace continued. The report then estimated the expected number of deaths in peacetime, cross-checked with German life tables. This presented the problem of deducting certain deaths twice when war casualties also were removed from the total. For instance, a man expected to have died in 1915 had there been peace may actually have perished in battle that year, accounting for two deaths. After deducting immigrants and emigrants estimated from the 1910 Census, and adding Germans residing in Austria (but not elsewhere), the result was 13,550,000 men eligible for service in the classes 1889-1916. ‘Serious question[s]’ might be asked of this formula, not least because of the limits to French statistics, but the committee believed that its methodology had reduced ‘the risk of serious error to small dimensions’.⁶⁵ The statement nevertheless was scarcely optimistic.

Matters worsened when the committee failed to uncover any ratios for the proportion of unfit men across age groups, meaning they must adopt ‘various substitutes’, such as the rate of mortality as the presumed ratio of unfit men.⁶⁶ A deduction of 23.8% unfit males ultimately was made, producing the final rounded figure of 10,700,000 Germans ‘fit and

available – had they been exposed merely to the risks of peace – in December 1915'.⁶⁷ To this figure was added the class of 1917, which was estimated to yield 500,000 men fit for service, by arbitrarily rounding the rate of fitness to 25% as the youths would be less likely to meet fitness requirements. This gave a total of 11,200,000 men for the classes of 1889 to 1917. The 1887-88 classes added another 370,000 men able to fight, plus 30,000 emigrants returned to Germany, bringing the committee's estimate to 11,600,000 men – close to the DMI's estimate of 11,500,000 men available.⁶⁸

From this figure, the men remaining in industry had to be deducted to understand the potential strength of the German field army. Here again the French analogy was critical, but statistics from the Board of Trade on the drain of British manpower from industry, along with the knowledge that Germany could employ POWs and men from occupied lands, indicated that they might not need a larger proportion of men in industry than France. Determining a precise number required much conjecture. The committee utilized Trade Union membership statistics to argue that not many more than 1,700,000 men were being retained for industry.⁶⁹ Ultimately, the methodology to calculate manpower had not radically changed since Brownlee's efforts in 1915. The committee had sought alternatives, but failed. Their final estimate rested on limited sources with no guarantee of accuracy. Whether the results were worth considering for the making of strategy was doubtful.

A trustworthy estimate for manpower proved elusive, but the matter of casualties – a number rather than an estimate of potential – appeared more likely to proffer certainty. Despite the united approach, doubts lingered about the lists. On 11th May, one day after the committee was created, a report noted that German units at Verdun were late in their reports. 'No less than 39 regiments have been silent as to their losses'.⁷⁰ Whether this was mere belation or a deliberate cover-up was difficult to ascertain. Battle began over this point at the committee's first meeting. Cox defined the army's stance: 'in the opinion of the D.M.I. no

reliable estimate could be based on the lists'.⁷¹ Schuster's position remained unchanged: the 'lists were accurate in the sense that they give all the enemy knows, and not a selection of what he knows'.⁷² The lists should be treated as a minimum, with allowance for belation, and comparisons to the casualties of Britain, France, and Russia. Both sides accepted that comparative methods must be central in the committee's analysis.⁷³ It was thus decided that German losses should be checked against British statistics to prove their honesty.⁷⁴

Belloc also was questioned about attrition. His assessments involved assumptions like estimating Austro-Hungarian losses as a fixed rate of 80% of Germany's losses, trusting documents found on German officers without question, and assuming that total wastage always was five or six times the number of the dead.⁷⁵ Belloc's method was to work out 'a rough minimum of the dead', and project this number to produce a total of casualties 'based upon the experiences of other belligerents' – a mix of comparison and extrapolation.⁷⁶ This suited his belief that the lists were only reliable on the reporting of the dead, although the figures provided had to be considered only 80% of the true total of killed, as there was consistent under-reporting.⁷⁷ Belloc therefore did not believe that the lists were entirely falsified, but 'suggested a test case' to confirm whether they were accurate.⁷⁸ This was exactly the sort of test which Schuster had shut down in 1915 as a waste of time.

A French memorandum explained why assessment of casualties was challenging. The author, while accepting that the lists might not be deliberate deception, claimed that this point was irrelevant: the issue is 'whether [the Germans] resolved to take considerable pains to publish complete and accurate lists of their losses'. Committee members knew that lists were unlikely to be complete, and the issue was whether they could even be used as a base. The French report increased this problem. Indeed, 'the example of France shows us that statements of losses drawn up day by day by the units in the field can be of no statistical value, especially in the case of the number killed'.⁷⁹ Misreporting was rampant, many men

died in ambulances and field hospitals without being reported, and errors were difficult to correct. Not only were the German lists of doubtful use, but equally so was the chief method for assessing them, comparison with the French.

Comparative analysis therefore was abandoned by the French in favor of extrapolation from reports on small sections of German society, such as parishes, businesses, factories, banks, sporting and intellectual associations, and academic unions. Such sources, the only alternative if the lists were discarded, hardly were infallible. These were not wholly representative, and working-class losses probably were over-estimated. Such problems were balanced to some degree by other omissions, but the extent was unclear. Temporary losses like wounded men, meanwhile, could not be discerned from permanent losses. These issues forced a return to the comparative method based on the incomplete French statistics. This to-ing and fro-ing depicts the problems with sources for assessors of attrition. The sources were so limited that any estimation must oscillate between two inadequate methods. Ultimately, the French report summed up the problem concisely: 'We have not nearly enough data to enable us to form a direct estimate of German temporary losses', which degraded all areas of this strategic assessment.⁸⁰

In order to advance, the EPC had to decide on the reliability of the lists. While Stevenson increasingly doubted them, Cox and Schuster decided to collaborate on determining their authenticity. Both agreed that the lists provided at least a minimum – the issue was how much greater was the real number. The committee examined Joseph Burn, the Actuary of the Prudential Assurance Company, on the matter.⁸¹ This examination highlighted the link between these assessments and strategy. Burn claimed that the lists were 'substantially accurate'. The percentages for each type of casualty remained consistent across the month, arguments such as POWs not being reported frequently proved untrue, extensive corrections lists were published, and losses on which the British struggled to make an

estimate – for instance a raid on Zeebrugge – were reported fully, above British anticipation of the damage inflicted.⁸² Burn reached a worrying conclusion: ‘if the German casualty lists are correct, it would seem that time up to the present has not been on our side as regards to the exhaustion of “man power” but has definitely been against us’.⁸³ This statement assumed that French losses matched the Germans, meaning that, with British and Belgian losses added, the Germans were inflicting more casualties than the Entente. This conclusion had significant implications for strategy: if Burn was right, it appeared that the Entente was losing.⁸⁴

Burn’s stance may not have been purely sincere. While Prudential volunteered for this work, they were a business. Central to Burn’s recommendations to resolve this problem was to investigate using Prudential’s Powers machines further, which might thereby make ‘our reports... of immeasurably greater value’.⁸⁵ Prudential stood to gain in prestige should the government favor these machines, and perhaps acquire government investment. This would support the uncertain future of their manufacturer, Powers Accounting Machine Company of America, for which Burn acquired the British Empire rights in 1919, and served as chairman of the British Powers Company.⁸⁶ The Powers machines were still working on these statistics in 1917, so it was not an entirely unproductive encounter for the Actuary.⁸⁷

Yet Burn endured a rocky session with the committee. Cox, joined by Schuster, highlighted errors such as the number of POWs the French had taken as against those noted on the lists. Burn soon rescinded swathes of his report: ‘my first estimate of the thing is very probably wrong’.⁸⁸ He was not a military expert and had used newspaper reports to understand Verdun. Cox retorted: ‘You get your figure [for Verdun] from the press, and I am afraid it is not right. The statements you make are not made on reliable data’.⁸⁹ Cox exposed Burn’s ignorance by ridiculing his comparison of the trench warfare of Verdun with the British experience of open warfare in 1914. Burn admitted ‘that the information has been

defective. But I think anyone trying to analyze the facts that I had before me would have come to the same conclusion'.⁹⁰ Burn hit the nail on the head: the problem was analysing what few 'facts' there were. Burn made errors, but the committee did no better.

The final EPC report came before the end of June. A year after the debates between Macdonogh and Schuster, the committee still grappled with the value of the German casualty lists. Of course, this problem also was evolving – the Germans certainly were minimising details in 1916, and perhaps what began as honest reporting developed into intentional falsification.⁹¹ Ultimately, the EPC did not discard the lists, but asked 'what amount of allowance should be made in our calculation for this abnormal retardation'?⁹² The committee 'can only say that it is possible, though not probable, that the percentage to be added on this account is so small as to be negligible'.⁹³ Certain committee members maintained that the lists were falsified, but all agreed to accept these lists 'with certain corrections and additions... as the basis of a minimum estimate'.⁹⁴ This was not a promising start to the assessment.

To expand this minimum estimate, the committee made several assumptions: that belation normally was six weeks to two months, that the POWs listed above those actually held by the Entente should be added to permanent losses, whilst the number of deaths from wounds and sickness, and floating losses of men temporarily unavailable, should be calculated on the British experience. Comparison was key to methodology and a cause for doubt: differences in experience could make these estimates untrustworthy.⁹⁵ The committee attempted to soften any criticism about inaccuracies – but this could not give policy-makers in Whitehall much faith in their findings, or willingness to apply the results to the waging of the war, the point of the exercise.

RESULTS

Over two years from the outbreak of war, on 9 September 1916 the EPC published their findings for the War Committee. It claimed that the classes 1889-1917 inclusive would provide 11,200,000 men for Germany.⁹⁶ From this figure, the committee deducted 2,600,000 as the number of casualties permanently lost up to 31 May 1916 (including 800,000 killed and died of wounds through to 31 January 1916 based on the lists, with the addition of 154,108 men the Germans reported as missing but were not POWs in Allied hands, so were presumed dead), and a floating loss – soldiers temporarily out of action but able to return in due course – at 700,000 men.⁹⁷ These losses, along with 1,000,000 men estimated training in depots, 200,000 men belonging to the navy (including casualties), 4,000,000 men at the front and 1,000,000 men on lines of communication, accounted for 9,500,000 of Germany's 11,200,000 manpower. The remaining 1,700,000 were employed in industry along with men unfit for service. 1,000,000 of them could not be removed for service if Germany was to meet its industrial needs (see Table 1). Their conclusion restated the source problems in plain terms. 'Every item in our calculation is open in greater or lesser degree to question', but because these numbers fit together and agreed with knowledge on Germany's labor position, 'we are enabled to regard these conclusions with some confidence as an approximation to the truth'.⁹⁸

On 'the effect of summing items, each one of which is in greater or lesser degree conjectural', the committee could now provide some conclusions.⁹⁹ It put Germany's reinforcements at 2,700,000: 1,000,000 in depots, 500,000 from the 1918 class, 500,000 more if the age of service was raised to 50, and 700,000 who could be stripped from industry (see Table 2).¹⁰⁰ On these estimates, the EPC deemed that – should attrition continue at this rate – Germany could fight on for more than a year, and potentially two. These conclusions were

inconvenient to all sides. Emerging in the midst of the Battle of the Somme, they showed that success in attrition was a distant and costly objective, several ‘Sommes’ away. These figures even suggested that Germany was winning the war of attrition on the Western Front – yet they remained too uncertain to challenge the military strategy. This was a group of analysts lacking the sources needed to conduct a confident strategic assessment. They failed to reach a firm agreement on basic facts, and resorted to dubious methodologies of extrapolation and comparison.

Judging the accuracy of these assessments is contentious given the problems with Germany’s casualty records to this day, reflecting the challenge faced by the committee.¹⁰¹ As Philpott has noted regarding statistics for the Somme, ‘an accurate figure... will never be established’.¹⁰² Regardless, when it comes to *shaping* strategy, accuracy of results is less important than faith in them by superiors. The doubt-riddled report of 1916 inspired little confidence. The effort to understand German manpower and attrition failed to move from a parlor game designed to sway colleagues, as with Callwell, into a reliable source for strategy. Insofar as they were believed, these figures would have discredited the arguments for attrition, but only on the margin. The importance of this work was with what it could not do, as against what it achieved.

1917: THE SEARCH FOR VICTORY

In the middle of a war of attrition, Britain had no means to measure its success. Despite staggering losses, the question was not whether to continue the war, but how to do so. The Somme had been bloody and not obviously a victory. When Lloyd George became Prime Minister in December 1916, he was intent on avoiding repetition. He preferred a ‘New

Eastern' strategy of tangible victories in the Middle East and Italian Front, to shore up public support for fighting the war to a victorious conclusion.¹⁰³ Fearful that the war might end in a compromise peace following the dismal Nivelle offensive in spring 1917, Lloyd George sought to safeguard British interests by bolstering its imperial position rather than by pouring unnecessary manpower into the trenches. This was not how soldiers saw the matter. The Somme had been critical in wearing down the Germany army, and 'two Sommes at once'¹⁰⁴ was the solution of General Sir Henry Wilson to defeat Germany in 1917 – in principle an accurate assessment, in practice a terrifying one.¹⁰⁵ This debate raged, allowing Lloyd George to argue that attrition should halt, and the army that it must continue. The differences between the new Prime Minister and his military leaders led to a significant civil-military split.¹⁰⁶ Meanwhile, France must be aided on the Western Front, and British and French generals accepted 'the default position [of] further attrition'.¹⁰⁷

The Battle of Arras could not be halted, but the main effort for 1917 seemed to be up for debate. Haig, who had replaced Field Marshal Sir John French as commander-in-chief of the BEF at the end of 1915 and oversaw the offensive on the Somme, supported another major offensive in Flanders to take German naval bases on the Belgian coast, so to assist the Royal Navy. Lloyd George preferred to fight against the Austro-Hungarians and the Ottomans. British desperation at sea against the U-boat blockade and the need to support the faltering Russians and French forced Britain to carry the strategic burden for the Entente. For Haig, an attack in Flanders would be the best way to do so. While few U-boats were stationed in the Belgian ports, taking the Flanders coast would neutralize surface raiders, affording greater protection to the Channel crossing for the army's supplies. This would be progress for the Royal Navy. An offensive also would pin German reserves to the British sector, denying the German army the ability to inflict further misery on the French army, which needed time to recover from the mutinies in the aftermath of the Nivelle offensive. As late as September

this matter worried Haig, and he noted the French General Philippe “Pétain’s opinion [that] its discipline is so bad that it could not resist a German offensive”. Yet more than ameliorating Allied deficiencies, Haig believed that an attack in Flanders held the possibility of defeating Germany. Twelve miles beyond Ypres lay Roulers, a vital railway junction. Taking this hub would significantly disrupt German logistics, and potentially prompt a withdrawal from the region. Coupled with the realisation that their *guerre de course* in the Atlantic would fail, Haig claimed that “the possibility of the collapse of Germany before the next winter becomes appreciably greater”. This would be another wearing out battle, but one that promised territorial rewards as well as attrition of the enemy which meant “Germany may well be forced to conclude peace on our terms before the end of the year”.¹⁰⁸ While not in agreement with Haig’s views, Lloyd George could not simply ignore Haig and Robertson, the CIGS, as he depended ‘on the support of Unionist members of parliament and the Northcliffe press that backed’ the pair.¹⁰⁹ However, they must show their masters that this battle, called Third Ypres, was essential.

To do so Haig exploited his own intelligence assessments, conducted at the front by General Headquarters (GHQ). GHQ Intelligence was rooted in the British Army tradition of a commander controlling field intelligence. Macdonogh deployed to the Western Front in 1914 at the head of a small section of six staff officers, comprising the entirety of GHQ Intelligence. This grew in size (to 23 officers) and remit as the war continued so to meet new challenges. Given this ‘haphazard evolution’ of British intelligence, analytical responsibilities were not clearly defined.¹¹⁰ While army intelligence had developed in London with the creation of bodies such as the Directorate of Military Intelligence in December 1915, Haig nevertheless had a right to make his own assessments. These were organized by his Brigadier General Intelligence (BGI) John Charteris, by methods as fallible as those of the EPC. Charteris relied on intelligence completely under his own command, and therefore was

challenged from the outside, but not decisively. His assessments were based primarily on classes and divisions, a reasonable means of considering German replenishment. By calculating the proportion of prisoners by age classes, Charteris claimed he could estimate when it had been used up: 'when a class furnishes more than 15 to 16% of prisoners, then that class has ceased to exist as a draft-furnishing source'.¹¹¹ He claimed that by the middle of 1917 the members of the 1918 class all were in service and the 1919 class was in or near the trenches. The movements of divisions enabled Charteris to make further claims about wastage. Every division withdrawn exhausted from the front was presumed to have taken 3,200 casualties. By this model, Charteris estimated that the Germans had suffered 100,000 total casualties in Flanders and Lens between mid-July and late August 1917.¹¹² His estimate of German losses on the British section of the front for the whole of 1917 increased the divisional figure to 3,500 casualties, producing an estimate of 710,500 casualties for German divisions engaged in severe fighting. He added a further 285,120 casualties to this figure by deciding that each German company on the British section of the front not engaged in battle had suffered an average of 5.5 casualties per week. Therefore by Charteris' estimates, the Germans had suffered almost one million casualties on the British section of the front alone in 1917.¹¹³ This method was based on a French system, although Charteris inflated his figures.¹¹⁴

Despite being arbitrary, these methods were generally accepted, both by the French and the Americans. However, they were prone to problems caused by extrapolating from small samples – Charteris' conclusion on the 1918 class rested on an analysis of a mere 3,669 POWs captured in July 1917. German published losses later indicated that only 4.7% of July's losses were from the 1918 class. Charteris' sample probably was anomalous, caused because Germany was filling gaps with new recruits on the front facing the British, where fighting was hardest. Moreover, Germany had recalled skilled, older men to help bring in the

harvest of 1917 following the bungled harvest of 1916.¹¹⁵ Therefore Charteris' methods suffered from similar flaws to those of the EPC.

The most in-depth analysis conducted by GHQ, in conjunction with the French War Ministry, was the analysis of *Soldbucher*. The initial French effort was disorganized, so Charteris improved it by sending two British women to work on ordering the sacks of captured *Soldbucher*. They sought to uncover what number of replacement a soldier was in a company, as indicated in the pay book, and then to plot this data onto graphs. This work continued into 1918 when Cox was promoted once again, this time replacing Charteris as BGI. However, he had little interest in these 'elaborate conclusions' of limited value.¹¹⁶ Evidently Cox had become jaded about the prospect of assessing attrition, a problem which he knew was not solvable.

However, GHQ treated its assessments of attrition with supreme confidence. Charteris believed intelligence officers should 'have the courage of [their] opinions'.¹¹⁷ Haig disliked pessimistic claims on attrition; the BGI had to be wary of submitting assessments he would not appreciate. Charteris, promoted at Haig's behest, needed to retain his chief's patronage.¹¹⁸ He turned out optimistic assessments of German manpower which probably he believed were true, but certainly were motivated to support Haig. This behaviour was unprofessional and warrants criticism, which came from the War Office and Macdonogh. The DMI told Charteris that his manpower assessments of August 1916 were wrong. The use of French estimates to claim that the German 1918 class could not take the field until 1917 implied that Germany would be exhausted by the end of 1916. Charteris sought to smooth this dispute by agreeing that German reserves would not be 'irretrievably' exhausted as new reserves would emerge in 1917.¹¹⁹ Disagreements continued for another year, with Charteris focusing on the deployment of divisions to make his estimates about casualties, and deeming German casualties to be 'higher in resisting the more prolonged, more intense and successful fighting

on the British front' than against unsuccessful French assaults.¹²⁰ Macdonogh rejected Charteris' estimates, finally stating 'I don't think anything is to be gained by pursuing the question of casualties, you have our opinion and we have yours and there is nothing more to be said... as you said in your letter, [it is] a matter of opinion'.¹²¹ Both men decided that they needed more data before resuming the discussion.¹²² Thus one of the most supportive officers of GHQ rejected a key part of its view, because he recognized how dubious these claims were. Even Haig's subordinates were doubtful: General Sir Henry Rawlinson stated that they would know when the Germans were broken 'instinctively. It will not be a matter of conjecture built upon the reports of prisoners and deserters'.¹²³

Haig used Charteris' assessments to back his arguments over strategy against Lloyd George. He used these to claim that there would be 'at least a German manpower crisis before the winter... as the main foundation in his announcement to the Cabinet that the Germans could be defeated in 1917'.¹²⁴ This claim was 'based not on mere optimism but on a thorough study of the situation'.¹²⁵ Haig's memorandum came with an appendix, likely authored by Charteris, which claimed that the reduced number of battalions, break up of regiments, and poor physical specimens of prisoners, indicated that the German army was 'within four to six months of the total exhaustion of her available manpower'.¹²⁶ Indicatively, Robertson suppressed this appendix as he rejected its conclusions. Both Robertson and Macdonogh, supporters of Haig's strategy, rejected the accuracy of the assessments of attrition which underpinned it.¹²⁷ They thought these claims actually weakened the case. Haig initially accepted Robertson's decision in writing, before outflanking him and presenting Charteris' verdict to the Cabinet Committee on War Policy verbally during his crucial visit to London to confirm his Third Ypres plans.¹²⁸ On 19 June Haig stated that 'Germany was within 6 months of the total exhaustion of her available manpower, *if the fighting continues at its present intensity*', emphasising 'the evidence of the captured company rolls, which all pointed in this

direction'.¹²⁹ Beach argues that Charteris' estimates were based on insufficient evidence, and 'Haig's opinions influenced the intelligence assessment rather than vice versa'.¹³⁰

The balance of intelligence ensured that even if Lloyd George doubted Haig's claims that he could win in 1917, he could not disprove him.¹³¹ The EPC could not give London the confident assertions which Charteris fed Haig. Their effort, despite using the most advanced data processing available, added only to the confusion. Lloyd George failed to overturn Haig and Robertson during their cross examinations in June, and given the political circumstances had no alternative but to approve the Flanders offensive on 16 July. While he still did not support the offensive, 'the politicians would not obstruct the soldiers' plans'.¹³² This decision was driven by fears of a French collapse. No other course offered the prospects that an attack in Flanders did. Haig outmanoeuvred Lloyd George by getting French and Belgian support for his plan, preventing a switch to the Italian front once Third Ypres began. The Prime Minister clung to the caveat that the attack could be halted if it turned into another Somme, revealing only his lack of understanding of 'the confusion and ambiguity which riddled the tactical planning of the battle' and prevented any clean break from it.¹³³

The EPC's second report was published in September 1917, with Third Ypres in full flow. This report, revised to 30 April 1917 for Germany, was written with Sir Julian Corbett, a naval theorist and historian,¹³⁴ and Sir Mackenzie Chalmers, a legal expert, added to bolster the EPC's capabilities.¹³⁵ Due to lingering doubts over calculations in the first report, and the likelihood of getting figures wrong via extrapolation the longer the war continued, the committee decided to focus solely on calculating the number of German reserves left. Even then, it found it problematic 'to suggest a particular figure for any remaining untrained reserve'.¹³⁶ The committee was ordered to produce a fresh estimate for men retained in industry, but found the data available still 'very unsatisfactory'.¹³⁷

The most striking change was the decision to drop the casualty lists as a key source.

Retardation of reportage was so significant that they no longer were useful as a basis. Instead, the committee paid attention to methods employed by the DMI. Arbitrary classifications were assigned to enemy units based on the intensity of fighting it had encountered that month. The three classifications were heavy fighting, normal trench warfare, or resting. Each category reflected an anticipated amount of losses, deducted as a percentage from that unit's strength. These percentages were based on British and French experience. Thus, if an enemy unit had been in normal trench warfare for one month, it would be assumed that it had suffered 6.15% losses for that period (with a subsequent deduction of 20% of the resulting figure 'to allow for the more rapid expansion of the British army and for the greater liveliness of the British front'). This methodology was similar to Charteris', but arguably more sophisticated. Projections also were made from small data sets, namely deaths of teachers.¹³⁸ The verdict remained bleak: 'no estimate of German casualties at the present stage of the war can be regarded as other than an approximation, containing very considerable possibilities of error'. The allowed margin for error on casualties was half a million men – almost one quarter of the total that Germany was estimated to suffer in 1917.¹³⁹ Also questioned was the use of comparative analysis in assessing industrial requirements: since 'the circumstances of countries differ so widely that the practice of one cannot be inferred from that of another', the estimates could not be made 'with any approach to accuracy'.¹⁴⁰ Other modifications included a higher percentage of men recruited from classes, as the bar for fitness had been lowered, allowing a poorer quality of recruit to serve, evidenced by German prisoners captured.

Doubts had deepened, and the utility of the committee dwindled further. The committee did not produce another report; the second report was the death knell for this form of strategic assessment. The effort to answer these questions had shown only that no sure answer could be found: London could not measure its success in this war of attrition, and

knew it. GHQ could not be refuted, and indeed by being put forward confidently, managed to weigh into the strategic debates of 1917 far more significantly than any work done by the EPC. The army had not attempted to de-rail the committee, but its failure was beneficial: GHQ preferred its own, subjective analysis to that of the War Office. With the end of the EPC, Haig's right to an independent assessment now became the only strategic assessment of manpower and attrition. The end to the scientific efforts of the EPC saw the triumph of the sort of assessments Callwell had written to please Kitchener at the start of the war. This continued even after Haig's claims that Third Ypres would destroy the German army by the end of the year proved false. From the summer of 1918 Haig trusted his own gut instincts over any input from his intelligence staff.¹⁴¹ The British war effort stumbled in the dark without intelligence to illuminate the way forward. Attrition was irrational as it could not be measured – but there was no alternative if the Central Powers were to be beaten. The German army had to be ground down in the main theatre of the war, regardless of whether that progress could be measured.

CONCLUSION

Ultimately, the attempt to assess German manpower and attrition failed. The sources were inadequate to enable such an effort. The census was outdated, requiring extrapolation and leaving it open to error. The casualty lists could not be fully trusted. All other sources took small, potentially anomalous samples, either from Trade Unions or POWs. This intelligence lacuna prevented the committee from producing confident estimates. Moreover, 'analytical methods were probably the weakest part of the British intelligence system'.¹⁴² The methods of extrapolating and comparing deployed by the committee could not produce

certain intelligence. These problems skewed the strategic assessment of manpower and attrition in London. Charteris worked under the same restraints, but overstated the certainty in his estimates for political reasons. Strategic assessment ultimately returned to its most primitive roots, with Haig's instinct taking the place of Prudential's tabulating machines. This was not a rational way to pursue a strategy of attrition.

Moreover, in the strategic debates of 1917, the decision to attack in Flanders was not the result purely of the need to aid Britain's allies, or the Royal Navy. Intelligence assessments of the enemy played an important role. Yet what proved crucial in the absence of certainty and accuracy in these assessments was confidence, false or not, in using estimates to influence the making of strategy. Consequently, this research demonstrates that the traditional views in the literature retain some merit. The decision to create and put into the field a continental army was not one based on a clear understanding of what precisely needed to be done to win the war, or whether it could be won. The bid to assess attrition began in earnest only once the war had reached a point of no return, and it was clear that it would be long and costly. London sought to understand whether its strategy could succeed only after it had fully committed to it – and found that it was not possible to tell conclusively. Yet Britain's strategy of attrition was one which was born out of necessity. As Philpott has explained, there was no alternative.¹⁴³

Assessing attrition is a difficult proposition for intelligence communities. It has not proven easier since 1918. The Second World War was as much a war of attrition as the first. Here strategic assessment also caused problems, most notably the debate over how far the Combined Bomber Offensive actually was damaging the German war economy.¹⁴⁴ Again, the order of battle controversy in the Vietnam War erupted from the effort to understand the strength of the North Vietnamese, the attrition inflicted, and whether the US was 'winning'.¹⁴⁵ The US sold its strategy on the 'cross-over point', which would be reached

when the North Vietnamese ran out of reserves. The American military felt the pressures confronted by Charteris and Cox of ensuring that they were winning.¹⁴⁶ Whilst the inability to solve this problem did not prevent Britain from winning its war of attrition in however costly a fashion, the falseness of this cross-over point in Vietnam came back to haunt Washington, when the supposedly exhausted North Vietnamese attacked during the Tet holiday of 1968. While the campaign proved a tactical defeat for North Vietnam, the shock of this incorrect assessment of enemy manpower reserves weakened the US in strategic terms. The problem of assessing enemy personnel in asymmetric warfare and defining victory has hindered other counter-insurgency campaigns since.

Successfully overcoming this problem of assessing attrition requires good, detailed, and trusted intelligence on one's enemy, such as the intelligence Ultra provided in the attack on the U-boats in the spring of 1943. Once extrapolation and calculation becomes necessary, the margin for error begins to irreversibly widen. Failure to gauge the success of attrition may make little difference in the end – or it may lead to disaster if too much stock is put into solving the problem. Either way, in total wars and counter-insurgency campaigns the civil-military organs of states must grasp the problem if they are to pursue a strategy of attrition.

APPENDIX

Table 1 EPC estimate of available German manpower: present mobilization and losses, 26 June 1916	
Men in service (at the front, on lines of communication, or in the navy (including naval casualties), classes 1889-1917)	5,200,000
Men training in depots	1,000,000
Permanent casualties sustained (up to 31 May 1916)	2,600,000
Floating casualties	700,000
Men employed in industry	1,700,000
Total	11,200,000
Source: CAB 24/2/26, 'Enemy Personnel Committee Report', 9 September 1916, pp. 15-7	

Table 2 EPC estimate of available German reinforcements, 26 June 1916	
Men training in depots	1,000,000
1918 class	500,000
Men available if service age limit raised to 50	500,000
Men available from industry	700,000
Total	2,700,000
Source: CAB 24/2/26, 'Enemy Personnel Committee Report', 9 September 1916, pp. 15-7	

NOTES

¹ I owe significant thanks to John Ferris for his supervision and guidance in the writing of this article. I am also grateful to John Porter of the Prudential archives for his assistance.

² The CID was created in 1902 'to bring together military, financial, economic, diplomatic, and governmental perspectives to achieve a coherent and coordinated defense policy'. See: Williamson Murray, 'The collapse of empire: British strategy, 1919-1945', in eds. Williamson Murray, MacGregor Knox, and Alvin Bernstein, *The Making of Strategy: Rulers, States, and War* (Cambridge: Cambridge University Press, 1994), p. 398.

³ Haig's optimism, and his qualities as a general, remain highly contentious in the historiography. The traditional school of thought contends that he was one of the so-called donkeys who oversaw 'hopeless offensives' which left his men 'so perilously exposed that they were nearly annihilated'. John Terraine led the counter-argument, and his views have found greater traction in recent years. Recently, Gary Sheffield has presented a more nuanced view which seeks to contextualise Haig as a man of his time, accepting that while he tended to be overly-optimistic, this optimism was not always misplaced. Moreover, his ruthless determination was an important trait which enabled him to successfully develop the BEF into an effective force, which in 1918 delivered Britain's greatest victory on land. See: Alan Clark, *The Donkeys* (London: Hutchinson & Co. Ltd, 1961), p. 186; John Terraine, *Douglas Haig: The Educated Soldier* (Hutchinson & Co. Ltd, 1963), p. xv; Gary Sheffield, *The Chief: Douglas Haig and the British Army* (London: Aurum Press Limited, 2011), pp. 368-79.

⁴ This 'distinctively British practice of war' was notably explained by Liddell Hart, who argued that Britain went astray by abandoning this centuries-old formula during the First World War. David French's comprehensive re-examination challenged aspects of this thesis. See: B. H. Liddell Hart, *The British Way in Warfare* (Faber & Faber Limited, 1932), p. 7; David French, *The British Way in Warfare 1688-2000* (London: Unwin Hyman, 1990), p. xv, 169.

⁵ David French, *British Strategy & War Aims* (London: Allen & Unwin, 1986), p. 57.

⁶ Diary entry by Sir Douglas Haig, 17 October 1915, in Gary Sheffield and John Bourne, eds., *Douglas Haig: War Diaries and Letters* (London: Phoenix, 2005), p. 165; WO 161/94, 'Committee of Imperial Defence – Population of Germany at Military Ages: Memorandum with Statistical Tables by Dr. Brownlee', 1 July 1915, p. 9; Hew Strachan, *The First World War* (London: Simon & Schuster, 2003), pp. 177, 207-215.

- ⁷ David French, 'The Meaning of Attrition, 1914-1916' in *The English Historical Review*, Vol. 103, No. 407 (1988), pp. 386, 404-5; William Philpott, *War of Attrition* (New York: The Overlook Press, 2014).
- ⁸ Kitchener was one of the empire's most respected soldiers, notable for his victory in the Battle of Omdurman, 1898. The Prime Minister, Herbert Henry Asquith, made him Secretary of State for War because he was seen as 'a strong man capable of carrying the country to war', not least because of his popularity among the public and in the press. See: Trevor Royle, *The Kitchener Enigma* (London: Michael Joseph, 1985), pp. 253-9.
- ⁹ Sheffield, *The Chief*, p. 103.
- ¹⁰ Philpott, *War of Attrition*, p. 229-30.
- ¹¹ Robertson, the first private in the British Army to ascend to the rank of Field Marshal, often is considered to be a puppet of Haig. He was not, although he believed that the job of the CIGS was to ensure that the commander in the field could carry out his operations. See: David Woodward, *Field Marshal Sir William Robertson: Chief of the Imperial General Staff in the Great War* (London: Praeger, 1998), p. xiii; Strachan, *First World War*, p. 177.
- ¹² Sheffield, *The Chief*, p. 162, 191, 363, 368; *Forgotten Victory* (London: Headline, 2001), p. 159; Philpott, *War of Attrition*, p. 266.
- ¹³ David French, *The Strategy of the Lloyd George Coalition, 1916-1918* (Oxford: Clarendon Press, 1995), p. 58.
- ¹⁴ Jim Beach, *Haig's Intelligence* (Cambridge: Cambridge University Press, 2013), pp. 169-70.
- ¹⁵ WO 161/92, untitled, memorandum by Sir Claud Schuster, 22 May 1916.
- ¹⁶ Philpott, *War of Attrition*, pp. 6, 160.
- ¹⁷ Chief of G-2-A to A. C. of S., G-2, G. H. Q., A. E. F., 8 June 1919, in *United States Army in the World War Vol. 13* (Center of Military History, United States Army, Washington, D.C., 1991), p. 25.
- ¹⁸ WO 161/91, 'Mr. Allin's and Mr. Hall's Joint Report', 10 September 1915, p. 1.
- ¹⁹ WO 161/94, 'Germany: Imperial Posts and Telegraphs: Percentage of Staff mobilized'; WO 161/92, 'Memorandum on the numerical resources and losses of the German Army', 15 March 1916, translated by War Office, 22 May 1916, p. 1; Beach, *Haig's Intelligence*, p. 175.
- ²⁰ Chief of G-2-A to A. C. of S., G-2, G. H. Q., A. E. F., 8.6.19, in *US Army in the World War Vol. 13*, p. 26; WO 161/94, Enemy Personnel Committee, 'Meeting: 29 May 1916'; Beach, *Haig's Intelligence*, p. 212.
- ²¹ Dudley Sommer, *Haldane of Cloan: His Life and Times, 1856-1928* (London: George Allen & Unwin Ltd, 1960), pp. 269-70, 312-3.
- ²² Oman was Chichele Professor of Modern History at All Souls College, Oxford. He did 'much valuable and confidential work in the War Office between 1914 and 1918', for which (along with his contributions as a professor) he was awarded a KBE. See: Charles Grant Robertson, *Sir Charles Oman, 1860-1946* (Oxford: Oxford University Press, 1946), pp. 1-4.
- ²³ See also: Philpott, *War of Attrition*, pp. 70-1.
- ²⁴ Kitchener wanted to build up a million-man army up before 'throw[ing] them into the field against a weakened Germany', meaning that he must resist calls to send his men into action piecemeal. See: Royle, *The Kitchener Enigma*, pp. 253-9.
- ²⁵ Callwell was a military theorist, best known for his work *Small Wars: Their Principles and Practice* (1896), which analysed the classification and fighting of small wars for empire. He was made Director of Military Operations upon the outbreak of war, replacing General Henry Wilson. This 'came as a complete surprise' to him, as he had spent the previous five years in civil life. See: Daniel Whittingham, 'Savage Warfare: C.E. Callwell, the roots of counter-insurgency, and the nineteenth century context', in *Small Wars & Insurgencies*, Vol. 23, Issues 4-5 (2012), p. 591; C. E. Callwell, *Experiences of a Dug-out, 1914-1918* (London: Constable, 1920), pp. 7-8, 108.
- ²⁶ French, 'The Meaning of Attrition', p. 390.
- ²⁷ Callwell, *Experiences of a Dug-out*, p. 108; French, 'The Meaning of Attrition', pp. 390-1.
- ²⁸ WO 161/88, Allin, Report I: 'Reliability of German Casualty Lists', 1 June 1915, p. 1.
- ²⁹ A respected man and a barrister, Macdonogh had been in the War Office for much of the decade leading up to the outbreak of war, becoming head of MO5 (Military Operations 5). This background in intelligence work made him a natural choice to lead GHQ Intelligence upon the army's deployment to the continent. He remained in this position until January 1916, when he returned to London to take over the newly created Directorate of Military Intelligence. See: Beach, *Haig's Intelligence*, p. 24, 45.
- ³⁰ WO 161/88, 'General Macdonogh's Report', 16 August 1915, pp. 1-2, 6, 15-6.
- ³¹ WO 161/88, 'Sir Claud Schuster's Reply to General Macdonogh's Report', 9 September 1915, pp. 5, 8-10.
- ³² Laurie Dennett, *A Sense of Security* (Cambridge: Granta Editions, 1998), pp. 204, 405; Beach, *Haig's Intelligence*, p. 176.
- ³³ WO 161/88, 'Mr. Allin's and Mr. Hall's Joint Report', 10 September 1915, pp. 1-2.
- ³⁴ ACT 1/72, Committee on Imperial Defence, Note by D. F. Renn, Departmental Record Officer, 15 April 1969.
- ³⁵ The involvement of the Press Bureau – 'the government's principal wartime press censorship organisation' –

in this politicised process is significant. See: Philip M. Taylor, *British Propaganda in the Twentieth Century: Selling Democracy* (Edinburgh: Edinburgh University Press, 1999), p. 9. Also: Gary S. Messinger, *British Propaganda and the state in the First World War* (Manchester: Manchester University Press, 1992), p. 100. For further information on British propaganda during the war, see: M. L. Sanders, 'Wellington House and British Propaganda during the First World War', in *The Historical Journal*, Vol. 18, No. 1 (1975), pp. 119-146.

³⁶ WO 161/88, Hall, Report III, 19 August 1915, pp. 9, 12.

³⁷ WO 161/88, 'Professor Oman's Report', September 1915, p. 1-3; 'Letter by Sir Claud Schuster disposing of conclusions arrived at in above Report', 16 September 1915, p. 1.

³⁸ WO 161/88, 'Sir Claud Schuster's memo', 21 September 1915, pp. 1-3.

³⁹ WO 161/88, 'German Casualties. Particulars required in order to estimate wastage', 6 October 1915, p. 1.

⁴⁰ WO 161/88, 'Report by Mr. Joyce on the Casualties of the German Army', October 1915, pp. 1-2.

⁴¹ WO 161/88, 'Memorandum by Mr. Allin', 16 December 1915, p. 5.

⁴² *Ibid*, pp. 4-5.

⁴³ WO 161/90, *The Times*, 9 February 1916.

⁴⁴ Philpott, *War of Attrition*, p. 230.

⁴⁵ Strachan, *First World War*, p. 180.

⁴⁶ ACT 1/72, Bernard Mallet to Sir Alfred Watson, 17 May 1916.

⁴⁷ WO 161/94, 'Minutes of Meeting on 15 May 1916'.

⁴⁸ In 1914 Cox was a junior map-provider working within GHQ Intelligence, but he quickly ascended through the ranks due to his undeniable talent for intelligence work. He spent the early years of the war working on tracking German force dispositions (initially alone). In doing so he became the key expert on the German army, writing an important handbook on the German order of battle. Consequently he was brought to London by Macdonogh when the latter became DMI at the start of 1916. While serving on the EPC, Cox was at the head of Military Intelligence 2(c) (MI2(c)) within the Directorate of Military Intelligence, which examined Germany. He received another significant promotion in February 1917, while still on the committee, when he was made head of Military Intelligence 3 (MI3), which was responsible for the broader war in Europe rather than just Germany. See: Beach, *Haig's Intelligence*, pp. 24, 28, 56-8.

⁴⁹ CAB 24/2/26, 'Enemy Personnel Committee Report', 9 September 1916, p. ii.

⁵⁰ WO 161/94, 'Population of Germany at Military Ages', pp. 1-5.

⁵¹ ACT 1/72, Schuster to Watson, 3 July 1915.

⁵² WO 161/94, First Meeting of the Committee, 15 May 1916.

⁵³ WO 161/94, 'Notes on Lines of Investigation open to the Committee', 20 May 1916.

⁵⁴ WO 161/92, untitled, memorandum by Sir Claud Schuster, 22 May 1916.

⁵⁵ WO 161/92, 'Memorandum on the numerical resources and losses of the German Army', 15 March 1916, translated by War Office, 22 May 1916, p. 3.

⁵⁶ WO 161/94, 'Notes on Lines of Investigation open to the Committee', 20 May 1916; italics are my own.

⁵⁷ Watson informed Mallet of the difficulty of knowing and deploying British statistics to solve the problem; ACT 1/72, Mallet and Watson correspondence, 17-18 May 1916.

⁵⁸ WO 161/94, Second Committee Meeting, 29 May 1916.

⁵⁹ WO 161/94, Second Committee Meeting, 29 May 1916.

⁶⁰ Press correspondents held a unique position, close enough to the front to appear credible, yet derided by the soldiers doing the fighting. One such target was William Beach Thomas of the Daily Mail, one of a small number of accredited correspondents with GHQ during Haig's time as Command-in-Chief, who was ridiculed in trench newspapers (as 'Mr. Teech Bomas'). These correspondents were hamstrung, however, by the structure in which they were trapped between the owners of newspapers, politicians, and generals. The result was voluntary self-censorship. See: 'The B.E.F. Times No. 1, Vol. 1', 1st December 1916, in F. J. Roberts and J. H. Pearson, eds., *The Wipers Times* (London: Eveleigh Nash & Grayson Limited, 1930); Stephen Badsey, *The British Army in Battle and Its Image* (London: Continuum, 2009), pp. 19-20.

⁶¹ 'Helloc's' estimates made wild assumptions, reducing enemy manpower for reasons such as 'obesity and other ailments engendered by a gross mode of living' or 'cold feet', implying that Belloc's estimates in *Land & Water* were similarly farcical. See: 'The Wipers Times No. 2, Vol. 1', 26th February 1916, and 'The Wipers Times No. 3, Vol. 1', 6th March 1916, in Roberts and Pearson, eds., *The Wipers Times*.

⁶² WO 161/94, 'Note on German Personnel: Statement prepared for the Committee by Mr. H. Belloc', pp. 3-5.

⁶³ WO 161/94, Fourth Committee Meeting, 6 June 1916.

⁶⁴ WO 161/92, untitled, memorandum by Sir Claud Schuster, 22 May 1916.

⁶⁵ CAB 24/2/26, 'Enemy Personnel Committee Report', 9 September 1916, pp. 2-3.

⁶⁶ *Ibid*, p. 3.

⁶⁷ *Ibid*, p. 6.

⁶⁸ *Ibid*, p. 6.

⁶⁹ *Ibid*, pp. 13-5.

- ⁷⁰ WO 161/88, 'Note on the Verdun Casualties Published Up To May 4th in the German Official Lists', 11th May 1916, p. 2.
- ⁷¹ WO 161/94, First Committee Meeting, 15 May 1916.
- ⁷² Ibid.
- ⁷³ WO 161/92, untitled, memorandum by Sir Claud Schuster, 22 May 1916.
- ⁷⁴ WO 161/94, 'Notes on Lines of Investigation open to the Committee', 20 May 1916.
- ⁷⁵ WO 161/94, 'Extracts from "LAND AND WATER"', compiled by Sir C. Schuster, 1915-16.
- ⁷⁶ WO 161/94, 'Note on German Personnel: Statement prepared for the Committee by Mr. H. Belloc', p. 7.
- ⁷⁷ Ibid, pp. 9-10.
- ⁷⁸ WO 161/94, Fourth Committee Meeting, 6 June 1916.
- ⁷⁹ WO 161/92, 'Memorandum on the numerical resources and losses of the German Army', 15 March 1916, translated by War Office, 22 May 1916, p. 17.
- ⁸⁰ Ibid, pp. 18-25.
- ⁸¹ WO 161/94, Second Committee Meeting, 29 May 1916.
- ⁸² WO 161/94, 'Report of German Casualty Figures', by Prudential Assurance Company Ltd., 17 May 1916, pp. 1-4.
- ⁸³ Ibid, pp. 1-2.
- ⁸⁴ The broader picture is more complex than Burn made it out to be. In terms of population, the Entente had the advantage over the Central Powers. For an in-depth discussion of how the Entente and the Central Powers measured up in terms of population, territory, and financial resources, see: Stephen Broadberry and Mark Harrison, eds., *The Economics of World War I* (Cambridge: Cambridge University Press, 2005), pp. 5-13.
- ⁸⁵ WO 161/94, 'Report of German Casualty Figures', by Prudential Assurance Company Ltd., 17 May 1916, pp. 6-8.
- ⁸⁶ Dennett, *A Sense of Security*, p. 230.
- ⁸⁷ Beach, *Haig's Intelligence*, p. 176.
- ⁸⁸ WO 161/94, Third Committee Meeting, 31 May 1916, pp. 1-4.
- ⁸⁹ Ibid, pp. 7-8.
- ⁹⁰ Ibid.
- ⁹¹ CAB 24/2/26, 'Enemy Personnel Committee Report', 9 September 1916, p. 7.
- ⁹² Ibid, p. 9.
- ⁹³ Ibid.
- ⁹⁴ Ibid, p. 10.
- ⁹⁵ Ibid, p. 11.
- ⁹⁶ Ibid, p. 7.
- ⁹⁷ Ibid, p. 12.
- ⁹⁸ Ibid, p. 17.
- ⁹⁹ Ibid, p. 15.
- ¹⁰⁰ Ibid, p. 15.
- ¹⁰¹ James H. McRandle and James Quirk, 'The Blood Test Revisited: A New Look at German Casualty Counts in World War I' in *The Journal of Military History*, Vol. 70, No. 3 (2006), p. 668; Niall Ferguson, *The Pity of War* (London: The Penguin Press, 1998), p. 296.
- ¹⁰² William Philpott, *Bloody Victory* (London: Little, Brown, 2009), p. 602.
- ¹⁰³ French, *The Strategy of the Lloyd George Coalition*, pp. 6-9, 17; Philpott, *War of Attrition*, pp. 266-7.
- ¹⁰⁴ Philpott, *War of Attrition*, pp. 249-51, 267.
- ¹⁰⁵ Wilson previously had served as Director of Military Operations, but was a casualty of the shake-up at the head of the British Army after the Battle of Loos, 1915. He moved to a more junior position as commander of IV Corps on the Western Front, where he served for much of 1916. See: Keith Jeffery, *Field Marshal Sir Henry Wilson: A Political Soldier* (Oxford: Oxford University Press, 2006), p. 131, 156.
- ¹⁰⁶ Robin Prior and Trevor Wilson, *Passchendaele: The Untold Story* (New Haven: Yale University Press, 1996), p. 27; Sheffield, *The Chief*, pp. 205-8.
- ¹⁰⁷ Philpott, *Bloody Victory*, pp. 486-7.
- ¹⁰⁸ Sheffield, *The Chief*, pp. 223-231.
- ¹⁰⁹ Philpott, *War of Attrition*, p. 276.
- ¹¹⁰ Beach, *Haig's Intelligence*, p. 26, 169.
- ¹¹¹ Memorandum by Charteris, 28 August 1917, in *United States Army in the World War Vol. 2* (Center of Military History, United States Army, Washington, D.C., 1948), p. 33.
- ¹¹² Ibid, p. 34.
- ¹¹³ AWM 51 [54], Memorandum by Charteris, 9 December 1917.
- ¹¹⁴ Chief of G-2-A to A. C. of S., G. H. Q., A. E. F, 8 June 1919, in *US Army in the World War Vol. 13*, p. 27.
- ¹¹⁵ Memorandum by Major D. G. Nolan, 9 September 1917, in *US Army in the World War Vol. 2*, p. 40.

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- ¹¹⁶ Beach, *Haig's Intelligence*, p. 178.
- ¹¹⁷ Ibid, p. 55.
- ¹¹⁸ Ibid, p. 51.
- ¹¹⁹ WO 158/897, Macdonogh to Charteris, 8 August 1916; Charteris to Macdonogh, 9 August 1916.
- ¹²⁰ WO 158/898, Charteris to Macdonogh, 7 June 1917, p. 4.
- ¹²¹ WO 158/898, Macdonogh to Charteris, 13 June 1917.
- ¹²² WO 158/898, Macdonogh to Charteris, 18 July 1917.
- ¹²³ AWM 252/A244, Memorandum by Rawlinson, 9 August 1917.
- ¹²⁴ Beach, *Haig's Intelligence*, p. 245-6.
- ¹²⁵ WO 158/24, 'Present Situation and Future Plans', 12 June 1917 p. 4.
- ¹²⁶ WO 158/24, 'Notes on the Strategical Situation', 11 June 1917, p. 4.
- ¹²⁷ William Robertson, *Soldiers and Statesmen Vol. 2* (London: Cassell and Company, Ltd., 1926).
- ¹²⁸ Beach, *Haig's Intelligence*, p. 245.
- ¹²⁹ Diary entry by Sir Douglas Haig, 19 June 1917, in Sheffield and Bourne, eds., *Douglas Haig*, p. 300; CAB 27/6, 'Cabinet Committee on War Policy Meeting', 19 June 1917, p. 13.
- ¹³⁰ Beach, *Haig's Intelligence*, pp. 245-6.
- ¹³¹ David Lloyd George, *War Memoirs of David Lloyd George Vol. IV* (London: Ivor Nicholson & Watson, 1934), pp. 2188-9.
- ¹³² Sheffield, *The Chief*, p. 231.
- ¹³³ French, *The Strategy of the Lloyd George Coalition*, pp. 116-22.
- ¹³⁴ Corbett had ties with the Admiralty prior to the war, lecturing at the War Course of the Admiralty. He entered government service in 1914, working not only to chronicle the war, but also as an advisor to senior naval officers and politicians, including Lloyd George. His work was highly-valued, and he received a knighthood in 1917. See: J. J. Widen, *Theorist of Maritime Strategy: Sir Julian Corbett and his Contribution to Military and Naval Thought* (Farnham: Ashgate, 2012), pp. 16-19.
- ¹³⁵ Chalmers' other war service included working on the war risks commission, and he chaired the commission investigating possible German atrocities in Belgium. See: Steve Hedley, 'Chalmers, Sir Mackenzie Dalzell (1847-1927)', *Oxford Dictionary of National Biography* (Oxford University Press, 2004).
- ¹³⁶ CAB 24/3/24, Enemy Personnel Committee Report, September 1917, p. 1.
- ¹³⁷ Ibid.
- ¹³⁸ Ibid, pp. 18-21.
- ¹³⁹ Ibid.
- ¹⁴⁰ Ibid, p. 3.
- ¹⁴¹ Beach, *Haig's Intelligence*, p. 319.
- ¹⁴² Ibid, p. 324.
- ¹⁴³ Philpott, *War of Attrition*, pp. 10-11.
- ¹⁴⁴ Richard Overy, *The Bombing War* (London: Allen Lane, 2013), pp. 257-8; Adam Tooze, *The Wages of Destruction* (New York: Viking, 2007), p. 650.
- ¹⁴⁵ John Stone, *Military Strategy* (London: Bloomburg, 2010), pp. 130-1.
- ¹⁴⁶ James Wirtz, 'Intelligence to Please? The Order of Battle Controversy during the Vietnam War' in *Political Science Quarterly*, Vol. 106, No. 2 (1991), p. 250.