

*USAAF and the RAF were just sufficient to transport two and two-thirds airborne divisions from England to Normandy.*<sup>28</sup>

Bidwell estimates that the break up of 2nd and 36th Infantry Divisions would have provided one-third of the men at most (many of whom would have been too old or unsuitable for LRP). The remainder would have had to be provided by the Gurkhas, or the British battalions integral to Indian formations, or the RA.<sup>29</sup>

Further absurdities in Wingate's paper may be highlighted. Wingate wrote of an advance to Bangkok and Hanoi. The distance from Imphal to the eastern frontier of India to Bangkok and Hanoi is almost 900 miles and over 750 miles respectively (for comparison, Berlin is less than 600 miles from London). Wingate wrote of a subsequent advance across China. The distance from Hanoi to Peking is over 1,400 miles. At the end of the war the Japanese still had a huge number of men in China. Wingate wrote of 20 to 25 LRP brigades. The break-up of 70th infantry Division had produced three LRP brigades, taking the total to six. Assuming that these six would still be usable at the conclusion of Op THURSDAY (which was not in fact the case), Wingate was asking for another 14 or 19 LRP brigades. To produce these it would be necessary to break up another 4.66 or 6.33 infantry divisions (one infantry division producing three LRP brigades). In short, Wingate was asking for a force (including the existing Special Force) equal to 6.66 or 8.33 infantry divisions. However, Wingate also wrote of 100,000 infantry.

The War Establishment of a rifle battalion was (including attached personnel) 845; there were nine rifle battalions in an infantry division (total 7,605). The War Establishment of the rifle battalions in the eight infantry divisions with which 21st Army Group helped to liberate France was 60,840. In asking for a force of 100,000 infantry, Wingate was asking for a force (including the existing Special Force) of over thirteen infantry divisions or more than 1.6 times the number possessed by 21st Army Group. To recap, in order to occupy Hanoi and Bangkok (which were crucial neither to the Japanese nor to the British), Wingate was proposing to move a very large force (equal to 6.66 or 8.33 or 13 infantry divisions) over very great distances (1.25 or 1.5 times the distance between London and Berlin). In light of this farrago of nonsense, the wonder is not that Wingate offended and upset, and was disliked and distrusted by, many highly distinguished officers; the wonder is that any of them bothered to take him seriously. The fact that Wingate had the ear of Churchill is the most likely explanation.

\* \* \*

THAT THERE WAS AN OVER-EXPANSION OF SPECIAL FORCES in the Far East during the war is undeniable. In 1944 there were ten Brigades organised, trained and equipped for special tasks in the Far East: two Brigades for amphibious operations (29 and 72 in the British-Indian 36th Division,); one Commando Brigade (3); one parachute (50) and Special Force of six Chindit Brigades. In the 1944 campaign the British-Indian 36th Division, temporarily employed in the Arakan as an ordinary infantry division, was used sparingly so that it should avoid losses and remain available for amphibious operations. The Brigades of the Special Force were in action for periods of from three to four months only. They suffered serious battle casualties, and the wastage from sickness and malnutrition was such that, on withdrawal, they were unfit for active service for an extended period. Because of the shortage of infantry (which the creation of the Special Force had helped to exacerbate), in the 1944-45 campaign Special Forces almost entirely disappeared. The British-Indian 36th Division was reorganised as an ordinary division to meet the urgent need for such a formation on the Northern Front. The Commando Brigade fought with distinction in the Arakan but for only a few weeks. Special Force was hors de combat from mid-1944 and was disbanded in the spring of 1945, two of its Brigades having already been transferred to the new Indian Airborne Division (only one battalion of which, in the event, was ever used).

Contrary to what Rooney and other supporters of Wingate allege, the judgement of the Official History of the Burma campaign on the Chindits is both balanced and appropriate:

*The campaign of 1944-45 amply bears out the contention, made by Auchinleck and Giffard at the time the Chindits were increased, that a well-trained standard division could carry out any operational task with little special training, and underlines the waste of manpower in forming forces fitted for particular tasks which, as opportunities for their use in the role for which they were designed are likely to be limited, may spend the greater part of the period of hostilities in inactivity.*<sup>32</sup>

The verdict of the National Army Museum's history of the Burma campaign on the Chindits is dismissive:

*Unless they can be fought over a long timescale, with the wholehearted support of indigenous populations, Chindit-style operations do not win wars. Neither time nor, with the notable exception of hill peoples such as Kachins, the Burmese population was on the Allied side. The Japanese collapse in the face of Slim's 1945 offensive was brought about by Mutaguchi's catastrophic defeat at Imphal, and the tacit but delib-*

*erate decision by the Japanese High Command to sacrifice remote Burma when faced with the crisis in the Pacific. Heroic in themselves, the Chindit operations contributed little to either calculation.*<sup>33</sup>

The judgement of the Official History of the Burma campaign is that the Chindits did not repay the heavy investment made in them.<sup>34</sup> Being concerned with the manpower aspect, Perry's judgement is even harsher but justifiably so:

*'It is difficult to avoid the conclusion that the results achieved by the force did not represent an adequate return for the resources invested. Essentially a guerrilla force, it was too lightly equipped either to capture strongly defended points or to hold them. Arguably it inflicted more damage and disruption on the British Army than it ever did on the Japanese.'*<sup>35</sup>

The bluntest verdict of all is that of Bidwell, who terms Wingate 'a quack' and 'a butcher'.<sup>36</sup> For all its bluntness, given the absurdities of the paper Wingate sent to Mounbatten on 11th February 1944 and given the appalling losses suffered by the Chindits in Op LONGCLOTH and Op THURSDAY, Bidwell's verdict is not unreasonable.

Referring to the proliferation of British Special Forces during WWII, Perry comments:

*'Certainly a considerable amount of effort was expended in developing such forces and in the eyes of some military authorities they did not give a worthwhile return for the resources they absorbed.'*<sup>37</sup>

One of those military authorities, Slim, was extremely critical of Special Forces in his account of the Burma campaign. He wrote that: *'Private armies – and for that matter private air forces – are expensive, wasteful, and unnecessary'*. Slim held that Special Forces had three drawbacks.

*Special Forces: reduce the quality of the rest of the army (especially the infantry) by skimming off the best soldiers; encourage the belief that certain operations can only be carried out by specially trained men; can only be employed for limited periods before they have to be withdrawn for recuperation.*<sup>38</sup>

Perry endorses Slim's list and adds a fourth drawback:

*'Special Forces, because of the exigencies of the moment, will often be called on to carry out tasks allocated to more regularly constituted units, when they prove to be untrained and ill-equipped for those tasks.'*<sup>39</sup>

\* \* \*

THE BRITISH ARMY'S EXPERIENCE OF SPECIAL FORCES during WWII provides overwhelming evidence to support the views of Slim, one of the greatest commanders in the history of the British Army, and of Perry, an authority on the Manpower of the Commonwealth Armies in the World Wars.

On any rational assessment, the inflated and under-employed Special Forces which the British Army possessed during WWII were not cost-effective. Quite simply, the benefits did not match the costs. They creamed off the best men from the rest of the Army, the infantry above all. They specialised in performing a particular role and could therefore only be used for one purpose; they were inflexible. Large numbers of picked troops, highly trained, were kept waiting for long periods to be used for short periods. They refused to perform other tasks unless forced to – and then did so pretty ineffectively compared to ordinary infantry. Special Forces attracted the very fittest (both mentally and physically) and most enterprising men to the detriment of the rest of the Army. Recruits were attracted by better conditions; better pay (eg parachute pay); glamour; danger and excitement; propaganda; escape from the frustrations of drill, sentry duty and fatigues.<sup>40</sup> Even when ordinary units were converted into Special Forces (without the option of volunteering) such as those of 70th Infantry Division, 'undesirables' ie those considered unfit, elderly, difficult etc were ruthlessly weeded out.

Inevitably, the main loser from the creation and dramatic growth of Special Forces during the war was the infantry. During the latter part of the war, with the British Army critically short of infantry, many Special Forces formations were re-roled as ordinary infantry, be they the Chindits, the Mountain Forces, the Commandos or the Airborne Forces. Seen against the background of a global shortage of infantry, such moves can only be considered as entirely justified. That there was (and still is) a need for a small, specially trained and equipped force to raid behind enemy lines (like the SAS), few would deny – least of all Slim or the present writer. It is clear, however, that the creation and maintenance of Special Forces of the great number, variety and size possessed by the British Army during WWII – the Parachute Brigades, the Airlanding Brigades, the Mountain Brigades, the Chindit Brigades, the SAS Brigade, the Commando Brigades and the Amphibious Brigades – totalling 91 battalions (equal to more than ten Infantry Divisions) at the peak – was uneconomical, unnecessary and harmful.

It is significant that the three most formidable armies in WWII – the German, Russian and Japanese – did not create and maintain Special Forces on the same scale as the British Army. The German Army employed a small number of Airborne Forces to capture Norway, Holland and Belgium in April and May

1940 and a larger number to capture Crete in May 1941. The British Army, mesmerised by the success of German Airborne Forces in these operations, decided to create its own Airborne Forces. Ironically, the German Army, painfully aware of the narrowness of the victories and of the heavy losses that its Airborne Forces had suffered, decided to employ its Airborne Forces in the ground role thereafter. After Crete, German Special Forces as such consisted of just the Brandenburg Regiment. There was of course the Waffen-SS, but the Waffen-SS was unlike Special Forces and like Guards in that it was organised into armoured and motor divisions and these fought as a matter of course alongside ordinary divisions.<sup>41</sup>

The creation and dramatic expansion of Britain's Special Forces during the war were primarily due to the interest, support and determination of Churchill, who was a sucker for any cloak and dagger enterprise. It is both ironic and paradoxical that Churchill, who constantly drew attention to and criticised the Army's declining infantry strength during the war, should be the man most responsible for depriving the infantry of large numbers of suitable personnel.

In any Army only a certain number of men have the physical fitness, youth, mental robustness and motivation necessary for combat duty (as regards the first two attributes, on the eve of D-Day only 70.7% of British Army other ranks were both A1 and under 41.<sup>42</sup> And these men have to be spread among the various combat arms: infantry, armour, artillery, engineers and signals. That in the British Army during the war the Infantry, RAC, RA, RE and the Royal Signals had to

compete for those men suitable for combat duty was inevitable. What was not inevitable however was the diversion of many men suitable for combat duty away from the combat arms, especially the Infantry, into Special Forces. The evidence presented in this paper clearly demonstrates three things. Firstly, that the diversion of a large quantity of high quality manpower away from the infantry and into Special Forces took place during the war. Secondly, that, measured by time spent in contact with the enemy or by damage inflicted on the enemy, Special Forces did not repay the heavy manpower investment made in them during the war. Thirdly, that the diversion of manpower away from the infantry and into Special Forces greatly helped both to cause and to exacerbate the infantry shortage which afflicted the British Army during the latter part of the war.

Let me end, as I began, with a quote. Just before Alamein, Stirling (the founder of the SAS) asked Montgomery for more men. Montgomery refused, saying:

*"You want only my best men; my most experienced and dependable men... What, Colonel Stirling, makes you assume that you can handle these men to greater advantage than myself?"*<sup>43</sup>

This question could have been legitimately asked of any of Britain's Special Forces by any of Britain's Army commanders during the war. No one had a greater right to ask this question than Slim, and no one had a greater obligation to answer it than Wingate.

## NOTES

- 1 Terraine, *The Right of the Line*, p 642.
- 2 General Return of the Strength of the British Army for the quarter ending 30 June 1944, AG Stats: WO73/16 1.
- 3 Woodburn Kirby, *The War against Japan*, Vol II, pp 243-4.
- 4 NAM, *The Forgotten War*, p 125.
- 5 Sykes, *One Wingate*, p 432.
- 6 *Ibid*, p434.
- 7 Churchill, *Closing the Ring*, p 656.
- 8 *ibid*, pp67-8.
- 9 Sykes, pp 458-461; Connell, *Auchinleck*, pp 745-6.
- 10 Woodburn Kirby, *War Against Japan*, Vol III, pp 5, 37 and 445.
- 11 Sykes, pp 483-4; NAM, pp 125-6.
- 12 Otway, *Airborne Forces*, p 358.
- 13 Perry, *The Commonwealth Armies*, p 71.
- 14 Joslen, *Orders of Battle*.
- 15 Review (anon) of Rooney's *Wingate and the Chindits: Redressing the Balance*, BAR, No 108, p 102.
- 16 Carver, *The Seven Ages of the British Army*, p 273.
- 17 WO73/16 1.
- 18 Slim, *Defeat into Victory*, pp 216-7.
- 19 Woodburn Kirby, Vol IV, p 26.
- 20 Slim, pp 376-7.
- 21 Otway, pp 343-4.
- 22 Franklin Mellor, *Casualties and Medical Statistics*, pp 105-6.
- 23 Sykes, pp 536-7.
- 24 Rooney, *Wingate and the Chindits: Redressing the Balance*, p 207.
- 25 Liddell Hart, *History of the Second World War*, p 517.
- 26 Sykes, p 536.
- 27 *Ibid*, pp511-2.
- 28 Bidwell, 'Wingate and the Official Historians: An Alternative View', *Journal Of Contemporary History* Vol 15, p 254.
- 29 *Ibid*, p 256.
- 30 Otway, p 397.
- 31 *Ibid*, p 399.
- 32 Woodburn Kirby, Vol IV, p 430.
- 33 NAM, Pp 25.
- 34 Woodburn Kirby, Vol IV, pp 27-30.
- 35 Perry, p 71.
- 36 Bidwell, *Guns at War*, pp 152 and 227.
- 37 Perry, p 59.
- 38 Slim, pp 546-9.
- 39 Perry, p 221.
- 40 Carver, p 274.
- 41 Ellis, *Victory in the West*, Vol I, App V, p 553.
- 42 AG's lecture of 29th May 1944: AG Stats branch memorandum.
- 43 Hoe, *David Stirling*, p 211.

# Keen As Mustard

## An analysis of the planned employment of the British Expeditionary Force's ground based offensive and defensive gas warfare systems in France and Belgium during 1939-1940

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### Introduction

On 3 September 1939, under Plan W4<sup>1</sup> Movement Table A4811, the first four Movement Control Officers<sup>2</sup> of the British Expeditionary Force (BEF) arrived by air in France, the spearhead of a very major deployment by the British Army onto the Continent. 152,031 soldiers<sup>3</sup> were in France by the end of September 1939, and the size of the Force grew nearly every day, reaching 438,636<sup>4</sup> by early May 1940. By mid-June 1940, the equivalent of fifteen infantry divisions, plus the 1st Armoured Division, had deployed to Theatre, a remarkable achievement. Amongst these thousands of soldiers and airmen, was a group of specialists, supported by other Arms and Services, whose task was to conduct, in support of the BEF, offensive and defensive operations using chemical weapons; 'Gas Warfare' in the parlance of the day.

In 1939, Chemical Warfare (CW) was defined as those aspects concerned with the offensive and defensive use of gas, incendiary and smoke munitions, and those defence measures required to protect British Forces. Gas Warfare (GW) related specifically to the employment, in military operations, by any nation of any chemical substance, solid, liquid or gas<sup>5</sup> that was to designed to have a poisonous or irritant affect, upon the human body<sup>6</sup> and this included tear gases. Consequently, gas was deemed to be a Special Weapon (SW) and one that required controls differing from those for incendiary and smoke.

Strategically, the use of gas in retaliation was considered to be a defensive act, whilst at the operational and tactical levels, the Staff planned to use gas to support ground operations with land based and air delivered gas weapons, to support offensive and defensive operations. Some types of gas weapons could be utilized for both, whilst others were designed for a specific type of operation, with an emphasis on defence. Throughout this article, the term gas will be used, to denote what are, in 2001, chemical weapons. Anti-gas operations, now called Chemical Defence, were an integral part of the planning process for gas warfare operations, and the Staff carefully studied the impact of the enemy's capability on British Forces.

Training and deployment were conducted in great secrecy and perhaps not surprisingly, little has been written on the BEF's Gas Warfare capability in 1939-1940, the Official History of the campaign, France and Flanders 1939-1940<sup>7</sup> not mentioning it at all. The specialist history of British gas warfare preparations during the Second World War, *Special Weapons and Types of Warfare*, Volume I - *Gas Warfare*<sup>8</sup> was, until 1984, graded SECRET; now UNCLASSIFIED<sup>9</sup> it is a rare but fascinating document, although perforce in its coverage discussion on the BEF is limited. Several books and articles have exposed the subject in out-



line, and others have focused in detail on the expansion of the United Kingdom's gas arsenal but there has been no recent serious study of the equipment, tactical deployment, capability and limitations of the BEF's expanding Land gas inventory. After 62 years, it is the aim of this article to fill this lacuna in this important but nonetheless little known, historical dimension of the British Expeditionary Force. It will however, not examine the BEF's defence measures against a German attack.

### Perceptions and Plans

Britain had, by 1918, a major gas capability which had been used widely and regularly on the Western Front.<sup>10</sup> This arsenal was not, as it had been in 1915, a retaliatory weapon, but a honed system integrated into the operational and tactical planning of the BEF.<sup>11</sup> The Armistice in November 1918 did not however, end the British Army's interest in gas warfare, nor terminate the deployment and use of weapons held in the United Kingdom's inventory. They were used in operations against Bolshevik Forces in Northern Russia during 1919<sup>12</sup> and would probably have been employed on the North-West Frontier during the 1920s had it not been for the opposition of a number of Government Departments.<sup>13</sup> Indeed, claims have been made that they were, but these suggestions require more research. The first post-war Arms Control Conference, from which emerged the Washington Naval Treaty, placed a temporary brake on the use and deployment of British gas weapons. It was followed by the 1925 Geneva Protocol, to which the United Kingdom was a signatory. Ratification occurred on 9 April 1930<sup>14</sup> after the United Kingdom Government added two significant caveats. First, that the agreement would not be binding if the country it was fighting had not ratified the protocol, and secondly, if any nation attacked the United Kingdom or its Armed Forces with chemical or biological weapons, the UK reserved the right to reply in kind. The Geneva Protocol was therefore, not a ban on research or stockpiling, but an agreement not to initiate first use.<sup>15</sup>

Arms Control activities did not however, reduce British interest in gas weapons, although the ratification of the Protocol reinforced the requirement for greater security and reducing profile. For example, chemical warfare nomenclature within the Services and at Porton Down<sup>16</sup> was amended to project a greater defensive aspect to their work but this did not stop those organizations charged with ensuring the United Kingdom had a gas weapon capability from improving it.<sup>17</sup>

The War Office and the Air Ministry had, to a greater or lesser extent, a clear interest in gas weapons, and maintained close links with Porton

Down. The Foreign Office, whilst hoping to achieve its task of creating enforceable GW control agreements, kept the options open, by stating that it was essential that the United Kingdom did not create an offensive capability which could not be screened, at least until the Disarmament Conference had demonstrably failed. The adoption, in 1935, by the War Office, of the Western Plan, identifying Germany as the major European threat with the attendant implications, highlighted the challenges from espionage and reinforced the importance of obtaining accurate information about potential threats. From this date, GW developments were cloaked in secrecy. General rearmament had yet to gather pace in 1935 but the period 1935-38 was a significant one in the development of British GW.<sup>18</sup> At a meeting at Porton Down on 11 September 1935, it was decided to proceed with improvements to the Livens Projector, initiate the development of a Bulk Contamination Vehicle, and examine the potential advantages of introducing into Land service, chemical mines and ground bombs. It is interesting to note though, that apart from the Livens Projector, all these GW were designed for defensive operations. By October 1936, the General Staff had formulated its position on the use of gas, and on 3 November, the Chief of the Imperial General Staff, Field Marshal Sir Cyril Deverell, issued to the Army Council a paper entitled: *The Development of Gas Weapons and Apparatus for Offensive Purposes*. In the Spring of 1937, the War Office produced a provisional establishment for a Chemical Warfare Company RE, and prepared notes on the tactical handling of the unit. In 1938, the Cabinet, faced with the collapse of the disarmament talks and the use of gas by the Italians<sup>19</sup> in Abyssinia,<sup>20</sup> opted to create a secret offensive capability by authorizing the production of gas weapons, including the expansion of industrial capability.<sup>21</sup> At the same time, it publicly initiated a number of active and passive preparations to defend the Nation against chemical attack,<sup>22</sup> including the mass issue of respirators. The public perception generally reflected government views, but perspectives were certainly focused by the number of books, which were published in the period 1937-40,<sup>23</sup> and in effect the population became increasingly 'Gas Minded'.

### Politics and Priorities

There were several issues that affected the introduction and expansion of a GW capability into the British Army. First and foremost, was the perceived threat from Germany and Italy. In studying the last comprehensive pre-war report on the subject,<sup>24</sup> the Cabinet concluded that both countries had the means of waging gas warfare but there was no reliable evidence about either their intentions, or the techni-

cal aspects of their preparations. The Cabinet, MI 10 and, more latterly, the BEF's GW Intelligence Sections were not initially, unduly concerned, as the German capability appeared to be broadly similar, although perceived to be much larger, to that of the United Kingdom. There was however, clearly no room for complacency, and the UK initiated a major GW programme to provide offensive capability both in offence and defence, and a sound defensive platform both strategically to protect the civil population in the United Kingdom, and tactically to protect military operations in the field.<sup>25</sup> There was therefore, little doubt in the minds of the planners, that gas warfare was a when not an if, and the War Office *Handbook on the German Army*, 1940, summarized perceptions:

*'It must be assumed, therefore, that Germany is in a high state of preparedness, both offensively and defensively, for gas warfare, and if the Germans deem it expedient to introduce gas warfare, it will be pursued with their characteristic vigour, ingenuity and ruthlessness... in the light of all information available, the indications are that the Germans are in a position to bring the gas weapons into effect as soon as they see fit to do so.'*<sup>26</sup>

The potential impact of the enemy GW capability was lucidly demonstrated by two alarms in the Autumn of 1939. The first, in September, related to a new toxic material, iron pentachromyl, which, upon assessment, Porton Down considered ineffective. The second, in October 1939, indicated that the Germans had perfected a new arsenical smoke, Arsine,<sup>27</sup> capable of penetrating the British respirator filter, and 400,000 service and 70,000,000 civilian respirator filters were modified although it transpired that Arsine was never deployed as a war gas.<sup>28</sup> At the same time, the Chemical Defence Research Establishment was tasked with a major review of the threat, and it issued a 21 page report on 8 January 1940, entitled: *Notes on CW Preparedness of Enemy and Potential Enemy Countries*.<sup>29</sup> Signed by the Chief Superintendent, it also reported upon the threat posed by Biological Warfare (BW) including the use, as war weapons, of various viruses, foot and mouth disease, and anthrax; the potential for water supplies to be attacked was given an especial mention. By the spring of 1940, MI 10 had accumulated sufficient technical information about German capability to enable it to conclude that mustard and phosgene were the most likely gases to be used, and to offer comment upon the performance of the various dissemination methods available. Overall, it was not positive reading but Britain's CW experts and the Government would have been much more con-

cerned had they been aware of the new developments in Germany relating to Nerve Gases.<sup>30</sup> The *Handbook on the German Army* offered therefore, upbeat direction on the future:

*Experimental work on a wide variety of other gases has been reported from time to time, but it is not thought that any new war gas has been discovered.*<sup>31</sup>

Secondly, there was the experience gained since the British Army had first employed GW in 1915. The BEF on the Western Front, and Expeditionary Forces in other theatres<sup>32</sup> had used GW to support operational and tactical deployments, and in 1919 the RAF had attacked Bolshevik Forces in Northern Russia with gas bombs. Planning and preparations were also made to use gas on the North-West Frontier of India, and there was considerable research conducted in the inter-war period into new chemical agents and the most effective means of delivery. Thirdly, there was the foreign policy of the Chamberlain government, which, until spring 1939, was firmly wedded to the concept of Limited Liability.<sup>33</sup> The central feature of this policy was to restrict any Land force commitment on the Continent to the minimum,<sup>34</sup> and this appeared at the time to some policy makers to make sound sense, although events were to prove otherwise. As the 1930s progressed, the need to place greater emphasis on defending the Empire began to focus the minds of strategists, whilst the increasing spectre of air attack on the United Kingdom base, added to the challenges within the defence environment.<sup>35</sup> The other effects of Limited Liability were varied, but the critical one concerned the size of the BEF,<sup>36</sup> and the concomitant constraints upon its Order of Battle (ORBAT). From the chemical ammunition perspective, the constant readjustments to defence priorities, and the scope of Limited Liability, made it difficult to plan on what the weapon population would be, and the level of War Maintenance Reserves (WMR) which should be provided. The Army had forces allocated for several tasks globally but the ammunition reserves<sup>37</sup> could not be directly translated to Continental operations because the WMR levels were different. Funding was reliant, at least in part, upon the priority of any expeditionary force's placing in the defence of the United Kingdom, but even this was subject to Treasury scrutiny, as the Cabinet attempted to ensure that defence spending did not unbalance the Kingdom's commercial and economic viability.

#### **Chemicals and Capability**

The Army concentrated on four key gases, which the experts believed would offer flexibility across the CW spectrum. A persistent vesicant, Mustard, was the

chemical of choice for the creation of casualties and the contamination of ground, equipment and buildings. Experience from the Western Front, indicated that as a casualty generator, it was 36 times (on a weight for weight calculation) more effective than High Explosive; Mustard was in 1939, and still is in 2001, not classed as a lethal agent but its effects can produce fatalities. Blistering to exposed areas of the body, which can be very severe, is the key result of exposure to Mustard but there are other effects; a whole cell poison, Mustard destroys enzymes, including those that promote DNA replication, and thereby, delays the healing process. The nervous system can be affected with large doses and because it is an alkylating carcinogenic poison, it can produce systemic effects similar to radiation exposure.

The British produced two main types of Mustard (chemical name dichlorodiethyl sulphide) in the period 1939–40, HS and HT. HS, often known as Pyro, was produced by combining ethylene with sulphur dichloride and was used to fill ground contamination artillery shells, the Livens drums, Bulk Contamination Vehicles, chemical mines and ground contamination bombs. Several variants were produced with solvents as additives, in order to lower the freezing point, and increase the rate of absorption through the skin. Air spray weapons and Base Ejection (BE) shells required a thicker Mustard to prevent the liquid being shattered into ineffective droplets during the delivery process. Initially, the British used HT, which carried the nomenclature of *Runcol* and a code name of SYRUP. HT was produced by reacting thiodiglycol with hydrochloric acid, and the process eventually produced a chemical, which although more expensive to produce, created an agent that had several operational advantages. In particular, it was more difficult to decontaminate than HS, although it was not suitable for tropical storage. For offensive ground operations it was preferable to use HS rather than HT, because of the greater persistency of the latter, and thereby reduce the chance of friendly forces encountering contaminated areas. Experiments indicated however, that if effective droplets were to reach the ground from High Level Spray operations, then a thickener would be required, and alloprene (a chlorinated rubber) was added to produce HTD (code name GLUE). The standard fill though, was HTV.

Experiments were also conducted with incapacitants, and in particular, a nose irritant, the sternutator, Diphenylaminechloroarsine. Abbreviated to DM, it was also known as 'Dental and Mental' because of the dramatic pain that it produced in the gums and the head; in April 1940, Britain was producing 3.5 tons per week. The Army also tested a persistent lachrimatory agent, Bromobenzyl Cyanide (BBC)<sup>38</sup> which

had an odour of soured fruit. First produced in 1881, it was introduced into French Army service in July 1918 and was part of the British inventory during the Second World War. BBC had several advantages and disadvantages. From a storage perspective, it was a difficult agent to handle, decomposing with time and vigorously attacking iron and steel. Vessels had therefore, to be lined with enamel, porcelain or glass. Artillery shells filled with BBC had to have a minimal bursting charge to prevent the decomposition of the chemical, a constraint that reduced its dispersal area. It was in 1940, the only tear gas that required decontamination with strong alkali, for example, slaked lime<sup>39</sup> so it had much merit for defensive operations. In the offence however, careful judgement was required, as BBC has considerable persistency; in the open, it can last three days, in woods seven, and in soil between 15 and 30. The British also planned to use a non-persistent lethal agent, phosgene, but in early 1940, insufficient supplies were available to use it as a chemical weapon filling until after the evacuation from France. It was though, an agent upon which the French were heavily reliant, and they built a factory at Clamency at the cost of 18 million Francs, to produce it. Phosgene (Carbonyl Dichloride) attacks the respiratory tract and the pulmonary lining, creating liquid production in the lungs and blisters (which can burst releasing blood and liquid) whilst the oedemas interfere with breathing. Phosgene is useful in offensive operations, as it is non-persistent, but the vapour is heavier than air, and can linger in trenches, ravines and sheltered areas, such as woods.

In 1939, the BEF's ground-based GW capability was limited. There was though, a definite intention, not only to have a retaliatory response, but also to create a major offensive and defensive gas capability, which could, if necessary, be integrated into every aspect of the BEF's operations. The only thing that prevented it from being brought to fruition was the German invasion of France and Belgium in May 1940. There was considerable debate about the role of GW in operations in the Continent, and in particular the application of it during mobile and static phases. It was perceived that there was a requirement to deliver capability in both environments, and the British systems were developed on this basis. Offensive capability was a mixture of air delivered munitions, and artillery shells with a chemical fill, and the systems were intended to have an operational level dimension, although in the early period, there were insufficient shells to enable this aspect to be successfully conducted by the artillery. In addition, in 1939, the Livens Projector was considered able to deliver support to offensive operations, although there were strong reasons, which will be explained,



for suggesting that this was an ineffective use of this weapon. Air delivered GW systems, and especially spray, were the key components of the offensive capability supporting the Land Forces and the history of these activities will be the subject of another article. Defensive operations were to be supported by mines, ground contamination bombs and the Bulk Contamination Vehicle. From the Land perspective therefore, there was a focus on defensive systems. The concept was however, sufficiently advanced for the Staff to have worked up tactical notes for deployment, which were issued as a six part series in Military Training Pamphlet No 32, *The Tactical and Technical Employment of Chemical Weapons*.

Each pamphlet had an important note, printed in bold type, which succinctly summarized the British Government's position on gas warfare.

*The British Government has no intention of initiating the use of gas. The British Army must, however, be prepared to protect itself against the use of gas by an enemy. A study of these methods by which gas might be employed in the field, is therefore, necessary; but such methods would only be adopted by the British Army if it were decided that retaliatory measures were required.<sup>40</sup>*

The publication programme, enacted between February and July 1940, was as follows: Part V (*The Chemical Mine*) February, Part VI (*Bombs, Ground, 6lb*) March, Part I (*Chemical Warfare Units – Organization, Employment and Training*) April. Part III (*The Cylinder*) and Part IV (*The Bulk Contamination Vehicle*) were issued in June, whilst Part II (*The Projector*) had a date of July. The disjointed nature of the promulgation, whilst clearly an effect of the failure to prepare in good time, demonstrated that despite the effort placed on the industrial production of chemical agents, the War Office was not in step with their tactical and operational employment. In particular, it is interesting to note that the documents for the two weapons, which were used in the First World War, the cylinder, and the Livens Projector, were the last to be issued! Either the newer weapons created more interest, or the War Office believed that experience in the former conflict would suffice until there was time to issue updated publications. In addition, Part I, *Chemical Warfare Units*, did not appear until April, which must have been frustrating for commanders, because there were three Chemical Warfare Companies in the BEF by December 1939.

#### Chemical Warfare Units

The British Army had several Arms and Services involved in storing, moving, deploying and employing its offensive and defensive gas weapons, which were usually referred to as Special Weapons (SW). The Army was also responsible for assisting the Royal Air

Force in deploying its SW on the Continent and in an early, and successful, period of Jointery, the two Services worked closely to achieve this task. The Royal Army Ordnance Corps (RAOC) was responsible for storing SW in Base Ammunition Depots (BAD) and for the BEF it controlled a designated field site, 21 BAD, near Fécamp in Northern France. The Auxiliary Military Pioneer Corps (AMPC) provided labour for building and handling tasks in the depot, and at the port. The Royal Engineers (RE) were responsible for constructing the depot, and the Corps controlled GW movement by rail and ship, although most of the assets were civilian. The Royal Army Service Corps (RASC) took the lead role in deploying SW by road at the corps and divisional level, and also provided vehicles and personnel for internal depot tasks and the loop between 21 BAD and the port, and the depot and railheads. The Royal Artillery (RA) handled GW as conventional rounds, although there were special controls over issue and employment. The RAF provided specialists at the port and 21 BAD for the handling, movement and storage of RAF SW, and also built their own facilities to support the Advanced Air Striking Force (AASF).<sup>41</sup> (RAF SW were also stored in the brickworks next to the AASF's Ammunition Railhead at Germaine and at a Forward Air Ammunition Park (FAAP) at Nogent L'Abbesse.

There was however, only one type of unit in the British Army, which was missioned and resourced to conduct GW and this was the Chemical Warfare (CW) Company RE. Each company had three sections ('hoops' in Millennium Speak) of four sub-sections (sections). Each sub-section had 3 x 15 cwt trucks<sup>42</sup> in which the Livens Projectors were carried and 1 x 15 cwt for the section's personnel. For operational purposes, the CW Company, with an establishment of 64 vehicles (excluding motor-cycles) was

Chemical Warfare Company – ORBAT <sup>43</sup>	
A Echelon	B Echelon
Coy HQ:	Coy HQ:
OC's Truck	G1098 Lorry
Met Truck	Tech Stores Lorry
3 x Motor Cycles	SOMS Lorry
Fitter Truck	Anti-gas eqpt Lorry
3 x Sects each:	15 cwt Truck (AA LMG)*
Comd's Truck	2IC's Truck
2 x Motor Cycles	Water Truck
3 x 15 cwt (Projectors)	3 x Sects each: Sect G1098 Lorry
1 x 15 cwt (Pers)	
Total Vehicles (less M/C) – 54	Total Vehicles (less M/C) – 10
* This vehicle also carried the Officers' Mess accoutrements!	



divided into two echelons: A and B, with the ORBAT shown below:

The Chemical Warfare (CW) Troops, in line with all parts of the Army, expanded quickly between September 1939 and May 1940. Consequently, many of the units were composed of conscripts, Territorials and Supplementary Reservists all of whom had little enough experience of the Army let alone supporting a mechanized force in an era of manoeuvre warfare in a chemical environment. Capability was limited by a raft of technical and logistic constraints, which were compounded by the shortage of key specialists. Whilst the British Army had plenty of experience from the First World War in handling gas munitions, and in 1918, there were fourteen different types of chemical shell and six types of gas cylinder,<sup>44</sup> there were insufficient personnel who were conversant with the current and proposed munitions. In addition, tactical deployment of some of the gas systems, was constrained by the shortage of suitable logistic load carriers.<sup>45</sup>

Early in 1939, No 58 (Chemical Defence) Company RE was upgraded from a training organization, to a Field Force unit. The establishment was so arranged that expansion could be effected by means of training Supplementary Reservists to provide the four chemical companies then visualized as being necessary for the BEF of four divisions. Before this scheme could be implemented however, compulsory military training came into force, and the concept was no longer adequate to meet the increased commitments of a rapidly expanding army. In June 1939, the planners estimated that at Mobilization plus eleven months, twenty-two companies would be needed, of which twelve would be raised through militia sources. A Militia Chemical Training Centre was to have commenced operations at Figsbury Camp, Winterbourne Dauntsey, in November 1939, before moving to Barton Stacey in March 1940. In the event, the resources were diverted to form No 11 Chemical Warfare Training Battalion RE. The Chemical Warfare Training Centre moved to Barton Stacey, and commenced training on 15 October 1939. From 15 December it was producing CW companies at the rate of one per month.<sup>46</sup> By May 1940, the Centre, by then consisting of an Officer Cadet Training Wing, No 24 CW Depot Battalion, and Nos 12 and 13 CW Training Battalions, had trained four CW companies. 58, 61 and 62 were in France, controlled by No 1 CW Group, and 63 Company was based at Bulford. In July 1940, No 11 CW Training Battalion moved to Barton Stacey<sup>47</sup> from Winterbourne Dauntsey.

A CW Group Headquarters on a basis of one to four CW companies, was provided as a Regimental command structure and the CW Group was under the GHQ Troops ORBAT with the CW Companies

allocated on a scale of one per division. The Group HQ was an operational one, and did not usually handle administration. The Commanding Officer, a Lieutenant Colonel, was assisted by an Adjutant and an Intelligence Officer, and the HQ had a small signals organization capable of transmitting, by telephone, fullerphone or visually, operational messages to six companies in a limited area; there was however, no radio equipment on the establishment. The C<sup>3</sup> structure and assets were therefore, hopelessly inadequate for a unit which was expected to operate at Army Level across a Corps front of two or three divisions. This structural failure was the result of a miscomprehension of the role of the CW Group, which was initially viewed as being most effectively utilized in the offence at divisional level, by concentrating its assets. The equipment was thought, because of its capability, most likely to be deployed to support defensive operations at corps or divisional level but the fragile C<sup>3</sup> arrangements militated against successful employment. In addition, because CW Companies were not divisional troops, co-operation with other arms in the field was more difficult than in the case of divisional engineer units, and Commander RE was keen that CW Company Commanders conducted close liaison with local unit commanders and staffs. There remained however, the problem of tactical and operational training with units and formations, and this issue was never satisfactorily resolved during the period of deployment in France. In April 1940, the BEF had one Chemical Warfare Group, consisting of a HQ and three CW Companies (58, 61 & 62). In the period June to November 1940, this was expected to expand by one company per month, with another three companies arriving in December, and thus by early January 1941, there would have been twelve companies in-Theatre.

It is surprising though, that more effort was not put into equipping the CW Companies with a heavy mortar capable of delivering less gas over a longer range, but with the capacity to revert to High Explosive (HE) if required. In 1940, whilst there were strong arguments in favour of this option, there were more forceful ones against it. The RE view was that, as the personnel of the CW Companies were trained engineers, they should be employed on field company tasks, when not conducting CW operations. To establish mortars in the CW Company that were dual roled for gas and HE delivery would divert Sappers into the functional areas of the infantry or artillery. In France, as GW never occurred during the campaign, the CW Companies reverted to field engineering tasks, with the Main Effort being demolitions. The opposing view argued that as the CW Companies could not execute wet bridging operations and they had little practice in other field com-

pany work, their retention solely for CW whilst essentially sound, was not a effective use of assets. This school believed that the CW Companies should be equipped with a mortar capable delivering gas, smoke and HE, in support of offensive and defensive operations. So armed, the CW Groups could have gained battle experience during conventional operations, thus enhancing their capability and morale. The first view was in the ascendant in 1940, but by 1941, the opposing school won the day, supported by the disappointing performance of the 5-inch rocket. With hindsight, the retention of resources devoted solely to chemical operations was undoubtedly a mistake, but a product of the equipment available.\*

### Offensive Capability

The main ground force chemical capability was to be delivered by artillery. Initially, the BEF's punch was restricted to 6- and 4.5-inch howitzer shells designed to contaminate ground. Shells had a bursting charge, activated by a percussion fuze, which broke the casing, thereby releasing the agent. Spread was uneven and usually limited to the point of impact, and some agent was driven into the crater. The main effect on the enemy was therefore, a local and a limited downwind vapour hazard rather than a direct contact one. In September 1939, these shells were held, in WMR, as empty casings from ammunition produced during the First World War but filling of both types, with HS Mustard, commenced in October 1939. 28,000 rounds of 6-inch were ready by the end of November and 18,000 rounds of 4.5-inch by the end of December; GHQ BEF planned to have 50% of the 4.5-inch ammunition filled with BBC but this was never implemented.

The GHQ Operations and CW Staffs eagerly awaited the arrival of Base Ejection (BE) air-burst chemical ammunition for the 25-pdr.† The Mark I (Y) shell weighed 20 lb, contained 2 lb of HT Mustard, and was designed as an antipersonnel weapon to support defensive operations. For offensive operations, the shell had a G (tear gas) fill of BBC, which although relatively persistent created, in comparison to mustard, a very small contact hazard. The shell was activated by a time fuze initiating a small bursting charge, which then compressed the liquid chemical against the shell base-plate. The over-pressure sheared off the plate and the liquid was ejected in droplets of varying size, the larger droplets falling to the ground first. During the descent, the spray was carried downwind, thereby expanding the area of contamination. A smoke-box in the shell indicated the height of the burst above the ground, and the strength and direc-

tion of the wind. The fuze could also be set to percussion, so the shell could be used to penetrate buildings. There were however, some technical limitations on the use of BE gas shell. The time fuze was unreliable and bursts occurred from 300 feet downwards, with a small percentage on graze. BE gas shell could only be fired from guns that had fired less than 5,000 EFC, and Charge 1 was not permitted. For field operations therefore, shoots were engaged on the target plus a 'frame' of 100 yards around it. For example, if a target area of one artillery square (100 yards x 100 yards) was engaged then a total area of nine squares required to be attacked. The target to frame proportion decreased with larger target areas, so Point Targets were less economical to engage than area ones but the requirement to introduce the frame fundamentally increased munition expenditure. Rounds per Artillery Square were initially assessed to be 10 rounds but after further trials and experience, this was set at 40. This 400% increase in ammunition requirements posed a considerable problem for the logisticians and demonstrates the immense importance of ensuring close co-operation between the Combat Arms, the Combat Support Services, procurement and industry.

Design and production difficulties, however, interrupted the planned issue programme and GHQ calculated that there would be no deliveries of any 25-pdr chemical ammunition until mid-September 1940. In the event, the prediction was accurate; on 1 October 1940 there were 200 rounds of Mustard charged shells and 2,000 awaiting filling.<sup>48</sup> Chemical rounds for this system were planned to be 10% of total holdings, with 50% being charged with mustard and 50% BBC. GHQ also looked into the future by planning chemical operations for the 5.5-inch gun/howitzer, proposing that all chemical ammunition for this weapon system should contain blister agent.<sup>49</sup> Gas artillery rounds, 'Grey Shell' in the colloquial of the day, were distributed in the same manner as conventional munitions, although their issue was subject to special control and handling measures.

In 1940, the other offensive gas weapon held by the Land Component of the BEF, was the Livens Projector, operated by CW Companies. Developed during the First World War, it consisted of a cast iron tube 3 feet in length and 8 inches in diameter, which fired a large cylindrical drum<sup>50</sup> by means of a charge box placed in the bottom of the Projector.<sup>51</sup> The drum fill was either 10.66 litres of mustard, with a range of 1,646 metres, or phosgene to 1,737 metres. Range was adjusted by altering the quantity of the charge. By design a weapon of static warfare, in WWI

\* This attitude is more surprising given the success of the 4-inch Stokes mortar used by WWI Chemical Companies. The 4.2-inch mortar reached chemical units in 1942, was used by them in the Desert fighting (firing HE and smoke!), but was transferred to infantry MG battalions when the Chemical Companies re-rolled in early 1943. In contrast, the US Army Chemical Corps went on firing its 4.2s in non-chemical missions to the end of the War.

† NBC community folklore has it that the 25-pdr mustard shell required 10,000 development and proof firings.



Livens Projector

it had been necessary to dig in every projector. The WW2 version could also be surface fired from a ladder monopod, and some of the projectors were mounted on dedicated MT<sup>52</sup> to make them more tac-



Livens Projectors dug in for multiple shoot

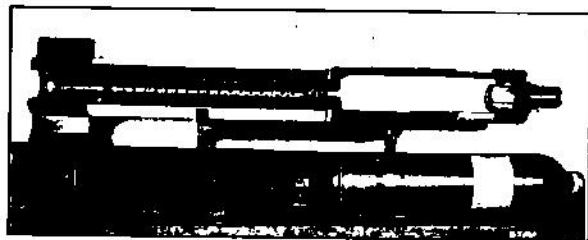
tically responsive. However, if concealment was necessary they still had to be dug in for firing, and to bring a CW Company into or out of action with this weapon was in all cases a ponderous activity. The Sections were particularly vulnerable to enemy artillery while recovering the projectors. A full salvo of 240 drums<sup>53</sup> from the one-shot tubes could though, produce a 'crash' concentration of gas, so as an area weapon it packed a short but powerful punch. The crash concentration was a key capability of the system, with the potential to produce large numbers of casualties before enemy personnel had time to adopt full protective equipment. The short range though, was a problem. Not only did it give friendly forces little stand-off protection from the vapour hazard if the wind changed direction but also the chances of obtaining surprise was greatly reduced unless meticulous security precautions were taken. The Livens drums in 1940 were filled with HS mustard in order to contaminate ground and personnel.

GHQ also planned to fill some Livens drums with phosgene, a potent lethal agent for its day, and one that could have given the Livens Projector a more offensive edge. In the round though, its short range and immobility made it unsuitable for offensive operations, so despite its high gas capacity to projectile weight ratio, it was a defensive rather than an offensive system, and it is surprising that it was classed as the latter. Given its interesting variation of shot, both in range, and deflection it was probably best suited to the one task it was never given: area contamination of ground during an out of contact withdrawal.\*

By 19 April 1940, stocks of Livens drums stood at 4,700, which was sufficient for seventeen Company shoots. This level of capability would have had little adverse effect on the Germans at the operational level. Given the right scenario, however, the tactical impact could have been considerable, although until stocks were increased the BEF was restricted to small shoots or very local contamination operations. Ammunition and projectors were supplied to the CW Companies through the GHQ Company RASC. The two echelons of the RASC Company carried 240 drums (one refill) and twenty spare projectors for each CW company. When a CW Company was detached from GHQ Troops, an element of the GHQ RASC Company was attached to the relevant formation RASC Company, which at divisional level would have been the Ammunition Company. Nearly all of the Livens Projectors were lost during the evacuation from France but emergency production in the summer and autumn of 1940 of this simple weapon soon replaced the losses.<sup>54</sup>

The Chemical Warfare Staff recognized the limitations of the Livens Projector as a weapon system, and in particular its short range and very limited tactical mobility. Despite the urgent need to produce a new system, experimental and industrial capacity was limited, so the solution was to utilize components readily available from other equipment, and from this idea, sprang the Unrotating Projectile (UP) 5 inch, using a 30 lb aircraft bomb casing as the container for the warhead. The GHQ CW Staff was, in April 1940,

5-inch UP



\* Phosgene (CG) was the standard chemical fill for Livens drums in WW1. As far as the Editor is aware, no mustard was fired from Livens projectors in that conflict. Although the Germans brought mustard into service in the latter half of 1917 (HS actually stands for 'Hot Stuff'), it only became available to British forces (in artillery shell) in September 1918. Much of the delay was in making the shell work (see note on 25 pdr above). We thoroughly endorse the author's statement here; one of the might-have-beens of WW1 is the effect of Livens-delivered mustard as counter-preparatory against the German Spring 1918 offensives.— Ed

examining potential tactical deployments for this weapon, which was planned to have a range of 3,200 metres, a distance double that of the Livens drum. It soon became obvious though, that the UP had limitations. In particular, the gas content of the warhead was considerably less than the Livens drum, which meant for a CW Rocket company to deliver an effective crash shoot, it required to fire 432 rockets. The tactical restrictions on its employment were never surmounted as even with six rocket troughs mounted to a stand, instead of the original four, it took a minimum of four hours to bring the system into action. In the event though, it was the technical failures and not the tactical constraints that prompted the abandonment of the introduction of the system in December 1942, at the same time that the Livens Projector became obsolete.

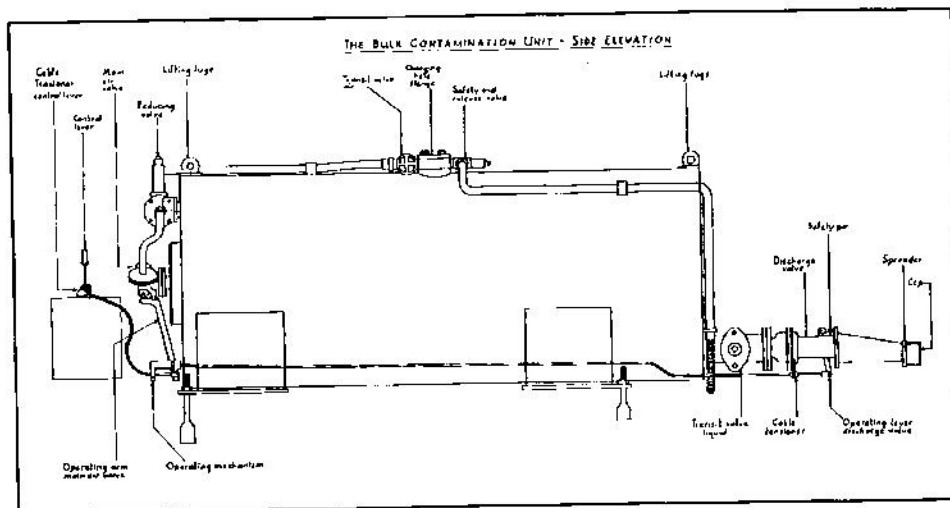
**Defensive Capability**

In addition to the offensive capability provided by the Livens Projector, the CW Companies also had the task of deploying chemical weapons in defence. All three of the systems envisaged, the Bulk Contamination Vehicle, the Chemical Mine and the Ground Contamination Bomb, were, because of production problems, not brought into service until after the BEF was evacuated from France. By the end of September 1940 however, considerable stocks of these weapons had been amassed. The Bulk Contamination Vehicle (BCV)<sup>55</sup> was based on a Morris CS8 15 cwt truck chassis, upon which was mounted a demountable contamination unit of 140 gall (636 ltr) Water Capacity (WC) capable of containing 126 gall (573 ltr) of liquid HF Mustard. The



Bulk Contamination Vehicle (prototype), May 1940

agent was discharged by pressurizing the container with compressed air at 20 psi, from a medium pressure cylinder with a Maximum Operating Pressure (MOP) of 250 psi,<sup>56</sup> which forced the agent through a discharge valve, and thence to a horizontal spreader pipe. Designed to heavily contaminate ground, and particularly roads and tracks, in defence or withdrawal, one vehicle, moving at 5-6 miles per hour, was capable of laying one gallon of blister agent every 25 sq yd (one litre per 5m<sup>2</sup> - a contamination level of about 200 gm/m<sup>2</sup>) over a continuous belt 16 yd wide x 200 yd long (14.6 x 183 m).<sup>\*</sup> Unarmoured, the BCV was vulnerable to small arms fire, artillery and mortars, which limited its deployment during a withdrawal in contact. However, the contamination unit could also be fitted in place of the tank on the standard water trailer and drawn by a Universal Carrier or other AFV. This provided a tactically sensible forward area technique, but the towing AFV would have to be provided by an armoured, armoured recce, or infantry unit.



BCV Unit - Naming of Parts

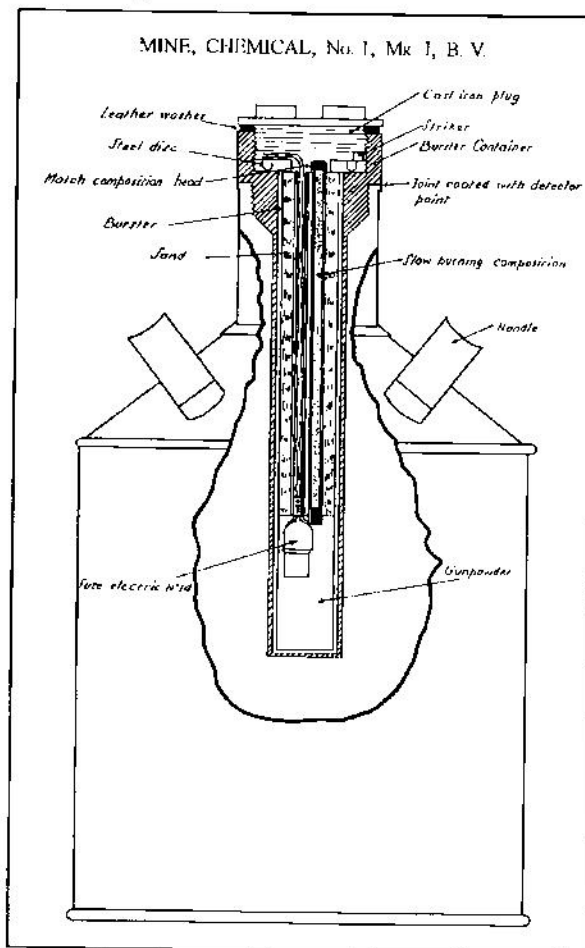
\* This is a colossal level of contamination by modern standards. Today's doctrine thinks in terms of a range of 1-10 gm/m<sup>2</sup> as military contamination levels, whether for mustard or persistent nerve agent. Pressure contact (eg knee) with a 200gm/m<sup>2</sup> concentration of liquid mustard agent would result in massive suit penetration, and the vapour hazard from this concentration would also be significant - the pamphlet warns of downwind effect. See descriptions of other ground contamination weapons below. - Ed



The discharge of 573 litres of mustard was not an activity to be taken lightly, and Military Training Pamphlet No 32 Part IV, *The Bulk Contamination Vehicle*, offered some advice as to the hazards to be avoided (risk assessments in Force Protection are not as new as one might think). The BEF's CW Group never held any BCV, because the equipment was not introduced into service until after the evacuation from France, but planning for their deployment and use was firm by late April 1940. BCV were not a permanent CW Company asset, and were held centrally, being issued as required, on a scale of 50 per company. 240 were allocated for deployment to France and GHQ intended that 120 would be held in the Base Ammunition Depots and 120 at Ammunition Railheads (ARH). CW Companies were tasked with collecting BCV from the ARH but given their many tasks, it is not unlikely that a Divisional Ammunition Company (DAC) RASC would have been involved in positioning these vehicles in the operational area. The refilling procedures for the BCV, whilst clearly a requirement, does not appear in the documents but it is probable that the Staff planned to return the empty equipment to the United Kingdom, although refilling by the French could have been an option. The RASC was however, never exposed to the challenge, as BCV were not issued until August 1940.<sup>57</sup>

The chemical mine was a commercial pattern cylindrical steel drum with a burster in the neck, two handles to carry it, and a filled weight of 60 lb (27.2 kg). Charged with four gallons (18.20 litres) of HS Mustard, it was designed for use on terrain that could not be reached using the BCV, and for the contamination of demolitions. It was therefore, not solely the preserve of the CW Companies and would have been issued to Field Engineer Companies. It could heavily contaminate, with accuracy, 200 sq yd (167m<sup>2</sup> at 50 gm/m<sup>2</sup>) of ground, and lightly contaminate 1000 sq yd (835 m<sup>2</sup> at 10 gm/m<sup>2</sup>), and thereby impose delay on enemy movement or the use of ground. Chemical mines were never issued to the BEF, as production started after the evacuation, but by 1 October 1940, 4,500 charged mines were available, with 525 empty.<sup>58</sup> The Bomb, Ground, 6 lb, (2.27 kg) charged with 1.14 litres of HS mustard, was used for small-scale contamination operations. Designed as an All Arms Weapon, it was particularly useful for contaminating trenches and small buildings. It heavily contaminated about 10 m<sup>2</sup> and lightly contaminated up to 100 m<sup>2</sup>. The Ground Bomb was too late into production to see service with the BEF, but by 1 October 1940, stocks stood at 73,300 charged and 92,000 empty, rising to 132,000 and 330,000 respectively by 19 December 1941. The CW Companies did not carry mines or ground bombs permanently, but by ground loading the Livens Projectors, there was sufficient transport to lift 864 mines and 7,920 ground bombs.<sup>59</sup> The only

gap in the doctrine was the supply of chemical mines and contamination bombs, for which Military Training Pamphlet No 32, Part I, stated: *Special provision must therefore be made.*<sup>60</sup> To date, no documentary evidence has emerged from the BEF's files, which would indicate how these munitions were to be distributed but it is probable that the divisional ammunition companies would have been tasked.



The Chemical Mine

#### Inter-Theatre Movement Operations

The movement of SW<sup>61</sup> to France was the subject of considerable debate within the War Office, and the Ministry of Transport. The Planning and Movements Staff had some experience from the First World War, and more recently, the shipment, in August 1939, of filled Smoke Curtain Installations (SCI)<sup>62</sup> and 250 lb Low Capacity (LC) bombs, filled with HTV and HS Mustard respectively, to Egypt. This operation was undoubtedly useful in focusing minds on some of the problems, but many had to be resolved as they appeared. The transportation of Hazardous Material in the United Kingdom was governed by various regulations, which were summarized in a document published in 1939, on behalf of His Majesty's Government, by the Railway Executive

Committee, *Instructions as to the Conveyance of Explosive, Inflammable Liquid, Corrosive and Poisonous Chemical, Compressed or Liquefied Gases and other Dangerous Goods by Rail, Road or Water*. This document clearly demonstrates that in some instances during war operations, whilst regulations may be dis-applied, the need for them still exists; HAZMAT is not as new as many believe! In 1939, gas weapons, regardless of whether they contained propellants or HE, were classified as Group XIII explosives. The storage, transport, maintenance and disposal were therefore subject to regulations, which were enshrined in an updated publication,<sup>63</sup> published by the Explosives Storage and Transport Committee (ESTC) in 1941 and classified as CONFIDENTIAL. 'Heavy case' weapons, as shells and Livens drums were described, had been moved during the First World War, and this knowledge was put to good use in 1939. Leakage did occasionally occur but for the most part, the robust nature of the containers reduced the chance of failure. The carriage of 'light case' weapons, such as the SCL, BCV and chemical mines, created a different problem. The container skins were designed to be thin, to permit a high gas to weight ratio, but this made them vulnerable to damage in transit. Much effort was therefore, expended to ensure that the appropriate safety procedures were applied: 573 litres of mustard spilling from a ruptured BCV onto a busy dockside was not a matter to be taken lightly!

The deployment of GW capability, both weapons and specialists was subject to political assent, which was granted in principle during October 1939. There were however, practical issues to be resolved and clearance for the dispatch of SW was not initiated until the War Cabinet's 79th Meeting, held on 11 November 1939, during which, at Item 5 – Poison Gas, it was decided:

*To authorize the Secretary of State for War to make the necessary arrangements for the dispatch of supplies of gas and equipment to France, on the understanding that every possible precaution should be taken to prevent observation.*<sup>64</sup>

The emphasis on security sparked a raft of most interesting loose minutes between Director Staff Duties (Weapons) (DSD(W)), Director Military Intelligence (DMI) and Director Movements (D Mov) all of whom disagreed on everything except the fact they that believed it was highly unlikely that security could be maintained! DSD(W), well ahead of his 'time in chemical risking taking, took the view that SW should be handled in the same manner as conventional munitions, stating that:

*Stevedores must work under conditions similar to those, which prevail where they are loading ammunition. This involves the risk of casualties but this must be accepted. Stevedores must however, be warned that they are handling dangerous material.*<sup>65</sup>

In addition, he believed that all markings must be obliterated during transit but that the Captain of the Ship must be informed of the cargo. D Mov took a different view. He believed that SW must be marked, every ship and train should have a Decontamination Squad, special ships should be used for transit to France, soldiers should replace stevedores, and that all those involved in SW storage and movement should carry their respirators in the Alert Position. DMI argued that this would give the game away, and suggested that the Decontamination Squads and their equipment should remain out of sight unless they were required to clear a spill. D Mov replied, arguing that the French decision to allow only Fecamp to be used to inload SW stocks would arouse German interest. DSD (W) then trod on D Mov's turf by suggesting that other matériel be brought in, to indicate that Fecamp had become another Channel Supply Port.<sup>66</sup> Frustrated by the continuing debate, DSD (W) wrote a stinging note, in which he expressed his view that there were no major difficulties in moving 'this stuff', as he described it, and that shipment should commence at the earliest opportunity. In this, he was supported by the Secretary of State, Leslie Hore-Belisha,<sup>67</sup> who was becoming increasingly concerned about the speed at which SW would arrive in France, and, abandoning a little of the previous caution, stated that:

*The risk must be taken owing to the vital importance of our army being equipped for defensive [ie retaliatory] purposes.*<sup>68</sup>

The result of this lengthy debate was that full identification and hazard markings were removed from all crates and boxes, although the shells, bombs and SCIs retained their grey paint. The arguments involved in this debate were clearly exposed four years later, on 2 December 1943. On this date, a German air attack on the Italian port of Bari illustrated the hazards of failing to ensure the correct authorities knew of, and were prepared for, a major spill from a ship or train. Amongst the many vessels involved, was the American Liberty Ship *John Harvey*, with a cargo including 100 tons of 2000 American M47A1 Mustard bombs. Those who were aware of the cargo were killed during the raid, and as the contents of the bombs were released, no alarm was given, and the appropriate defensive measures not taken. During the action, over 1000 Allied military person-

nel and an unknown number of civilians died, the casualty figures being undoubtedly increased by the presence of mustard agent.<sup>69</sup>

**Storing Gas in France**

Researching the storage and movement of SW is difficult. Security in 1940 was tight, and the War Diaries, classified as SECRET, of units dealing with chemical weapon storage rarely mention them. The deployment and storage of chemical weapons did not follow the Internal Line of Communication (ILOC) which had been established to support the BEF. In late 1939, conventional ammunition was shipped from Fowey and Newport, to the Theatre Main Base Area (MBA) located in the Brest-Rennes-Nantes Triangle, with Brest, St Malo, St Nazaire being the Sea Ports of Debarkation (SPOD). Two Base Ammunition Depots<sup>70</sup> were initially established, one in each of the two Base Sub-Areas, which were known as the Northern and Southern Bases. The location, far to the West, was chosen because of the fear of air attack, a factor that often became an obsession in the minds of some of the operational and logistic planners. Movement forward to the Corps areas was carried out by rail, but the War Office initially had grave concerns about moving SW by this method, perceiving difficulties in controlling the extraction of the weapons from Theatre. It was therefore, decided to store most of them in the Advanced Base Area (ABA)<sup>71</sup> using a short sea crossing. From the few records that remain, it would appear that all the BEF's SW were shipped from Newhaven in Sussex to Fécamp in France in Operation FLANNELFOOT. Most of the voyages were undertaken by the SS *Clewby*, a steam collier of 645 tons built in 1904.<sup>72</sup> The first gas weapons arrived at Fécamp on 12 December 1939, for onward movement to 21 BAD. There was no reference to the detail of the shipment but almost certainly it contained SCI for the RAF. The few references in published accounts, state that all the Special Weapons were stored at 21 BAD but research indicates that this was not the case. The table, compiled from GHQ Q Maint Q/ 1193(b) dated 15 February 1940, and the BAD War Diaries, summarizes the outline deployment of Army controlled SW in the BADs until June 1940. SW were also deployed to Ammunition Railheads. It is interesting to note that

apart from 6 BAD, which was only used for SW during the evacuation, all the depots were served by road.

The pressure the BADs were under to accept chemical munitions is clearly illustrated by the experience of 3 BAD.<sup>73</sup> It mobilized at Bramley on 10 November 1939 and deployed to France, still short of key personnel, before Christmas and began to establish a road-served BAD near Rouen, with three 21,000 ton sub-depots, and the Depot Railhead at Buchy. A team carried out a reconnaissance for a Grey Shell area on 25 December, and SW stocks arrived on the SS *Clewby*, which docked at Fecamp during 2 January 1940. The War Diary does not indicate what the shipment contained, but it was probably 4.5- or 6-inch ammunition. A note on 3 February 1940 gives greater detail, stating that 3,258 rounds of 6-inch Grey Shell had been receipted into No 1 Sub-Depot and there were more receipts on 6 February.<sup>74</sup> BAD also receipted SW, the existence of which may or may not, have been discussed in April with the Army Staff College reconnaissance team, visiting in preparation

for the student visit in June; Staff College Field Demonstrations have a long history! Another interesting and mysterious activity was the dispatch, on two trains, of 120 tons of Naval Expeditionary Force (NEF) stores, which was sent from 21 BAD to Mommunheim on 12 and 16 May. The War Diary of 21 BAD<sup>75</sup> unfortunately does not elaborate on the manifest but does state both shipments had

**Base Ammunition Depots in France - February 1940**

BAD	Name	Town	Access	SW	Remarks
1	Foret de Garve	Nantes	Road	Yes	
2	Plouaret	Brest	Road		
3	St Saens	Rouen	Road	Yes	Forward BAD
4	Rennes	Rennes	Rail		
5	Le Garve	Nantes	Rail		
6	Yvetot	Le Havre	Rail	Yes	During evacuation - May 1940
21	Fecamp	Le Havre	Road	Yes	Main SW Depot
22	Miniac	St Malo	Rail		Formerly 8 BAD

a special naval guard and that the depot was visited by Admiral Fitzgerald, which indicates that whatever the consignment contained, it must have been of particular significance. It is highly unlikely, given that 21 BAD stored SW, that the shipments did not include munitions, and it is possible that they were consignments of naval 6- or 4.7-inch gas shell<sup>76</sup> being urgently transferred to the Mediterranean Fleet through France, in preparation for operations against Italy.

Whilst the War Office files are replete with policy, the War Diary of 21 BAD,<sup>77</sup> the unit holding most of the SW stocks, describes sometimes with considerable irritation the constant round of inspections, concerns over security and the daily grind of operating with a shortage of trained and experienced staff. These aspects are of particular relevance, as it is remarkable, given the military significance, political sensitivity and technical challenge of the tasks, that the War Office

and GHQ BEF failed to grasp the importance of ensuring 21 BAD was properly resourced to execute its work. Despite much staffing and prodding from the Unit, through the Chain of Command, the War Office insisted that 21 BAD was an Ammunition Railhead (ARH) and refused to recognize its SW status and its Port Ordnance responsibilities; consequently, it was never granted a Special Establishment. Despite its importance, 21 BAD was therefore, not issued with the correct stores and the Quartermaster found it difficult to acquire them, and, as early as 14 December 1939, the War Diary was noting a shortage of labour, transport and the requirement for a mobile crane. The fact that the unit diarist had to write on blank paper because the relevant form, the AF C2118, was not available until mid-February 1940, is perhaps a clear example of the many frustrations the personnel of 21 BAD faced. Whether the War Office position was part of a security cloak, or an impressive piece of incompetence, is impossible to determine from the documents, but the Depot Commander's frustrations are clearly articulated in the War Diary. It was indeed unfortunate, that the visit of the BEF's Quartermaster General, Lieutenant General Lindsell on 19 March 1940, was cancelled; there was much he needed to see. Apart from that, the Officer Commanding, Captain J A Tandy MC RAOC had made special arrangements for him to have a hot bath!

A summary of the BAD personnel deployment for 29 March 1940, clearly illustrates the problems inherent in failing to create a meaningful ORBAT for a specialist task; only 18.5% of the personnel in the BAD were cap-badged RAOC, although the RAF personnel were employed as specialists. Members of the RASC were also deployed to 21 BAD. At the end of March 1940, there were five soldiers from No 3 Line of Communication and 4th Reserve MT Companies and another 58 from the 50th Divisional Ammunition Sub Park RASC, nearly all of whom were employed to inload, by road, SW from the port at Fecamp.

**21 BAD - Personnel on 29 March 1940**

Unit	Personnel
21 BAD RAOC	30
4th Reserve MT Company RASC	4
No 3 Line Of Communication Company RASC	1
50th Divisional Ammunition Sub Park RASC	58
Highland Light Infantry	31
106th Company AMPC	24
Royal Air Force	14
TOTAL	162

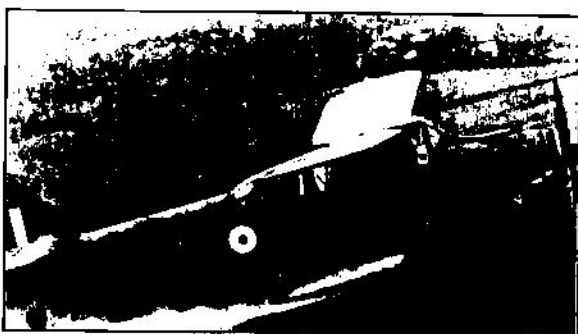
There were though, more problems in the structure and command of the organization, which merit

further examination, because on 7 May 1940, key personnel were being employed on fatigues as well as ammunition work. No doubt their specializations held no weight with the Sergeant Major's Guard Roster Clerk but one detects within the War Diary, pressure upon the Officer Commanding from all the Detachment Commanders, to ensure that every soldier, regardless of his trade, did his fair share of duties. Whatever the personal perspectives, the use of the few technically trained staff in this manner certainly generated additional operational fragility, and is a problem relevant to the Army of the 21st Century. As they struggled to complete their tasks, the Officers and Soldiers of 21 BAD had to operate in the coldest winter since 1830. The War Diary provides ample testimony to the terrible conditions of January 1940.

Date	AF C2118 entry
16 January	Heavy snow storms made roads in the area impassable in many areas... work was brought to a standstill at the dump.
18 January	Further blizzards resulted in one route to Fecamp being blocked to a depth of seven feet of snow in drifts. On the alternative route transport was compelled to take to the open fields to avoid burial in the snow.
29 January	The outside temperature did not rise above freezing point... trees, poles and pylons were hurled to the ground by the weight of ice. Telephone communications were cut off...

Another problem, exacerbated by the demanding conditions, was the fragility of some of the manpower available for heavy labouring duties in the Auxiliary Military Pioneer Companies, a matter which was the subject of a letter to the War Office from GHQ.<sup>78</sup> With many personnel aged between 35-50, the rigours of the winter were having an adverse affect upon individual performance, and the Staff were examining ways of deploying AMPC personnel to greater effect. As the deployment to France continued into 1940, GHQ also had a plan to release some male soldiers from a range of duties and replace them with women from the Auxiliary Territorial Service (ATS). Both No 1 and No 2 BADs were part of this plan,<sup>79</sup> issued by GHQ on 25 February 1940. The plan included 55 ATS to replace 45 men at No 1 BAD and 43 ATS to replace 32 men





Fairey Albacore operating SCI

at No 2 BAD, although Director ATS (DATS) considered No 2 BAD as highly unsuitable for the employment of ATS because of the harsh living conditions. The plan for the BADs is summarized below:

ATS Plan - No 1 and No 2 BADs		
Trade	No1 BAD	No2 BAD
Clerk	26	14
Cook	18	4
Driver	4	15
General Duty	3	4
Orderly	4	6
Total	55	43

Combat operations overtook the planning for all of these activities and the War Diaries<sup>80</sup> of both units have no record of ATS arriving in their locations, nor were any shown on the Field Return of Officers (AF W3008) or Soldiers (AF W3009). There were, though, according to AG's Statistical Return 3/944/40 dated 2 August 1940,<sup>81</sup> 686 ATS in France in early May, and it is clear that had the German invasion not occurred when it did, there would have been many more. Given the impending arrival of the ATS, it is surprising that there is so little comment in the War Diaries particularly given the natures that were likely to be in store; perhaps, given the shortage of manpower, the gender issues were not important. There is every probability that had the ATS deployed, they might have had to handle SW, but there is no evidence to indicate any discussion on the subject. On 11 May 1940, with the German attack in full swing, the War Diary noted that ADOS (Ammunition) had advised that the establishment would be that of an ARH, whilst also reporting the possible presence of enemy parachute troops between Le Havre and Fécamp. Needless to say, the urgency of combat operations interrupted further discussion on the subject of establishments but the Officer Commanding no doubt reflected upon the rapid arrival of the Germans and the tardy and inadequate response of the War Office.

### Theatre Planning

There was considerable debate within GHQ, about the use of Special Weapons but by April 1940, the Staff had refined the concept sufficiently to draft plans. Without dipping into the detail of offensive and defensive operations, these focused on three fundamental uses of SW. The first was to cause casualties, and this was best achieved by using a vesicant, such as mustard, delivered by aircraft bomb or artillery round. A crash shoot with the Livens Projector was also feasible, but difficult to mount. In addition, for offensive operations, the use of tear gas, delivered by artillery, was also a future option, and BBC rounds were ordered for the Theatre. The key component of attacks designed to create casualties was surprise, without which, the enemy would have time to execute defence measures, and there was much discussion, both during meetings and in writing, on how this might be best achieved. Secondly, SW could contaminate ground, and thereby render it more difficult, but not impossible, to occupy or traverse. There were several weapons in or entering service capable of achieving this aim: 4.5- and 6-inch shell, the BCV system, chemical mines, ground bombs and the Livens Projector. Thirdly, the SCI systems held by the RAF were capable of reducing the enemy's generation of tempo by degrading his operational capability. The use of spray against railheads, supply areas and assembly areas, whilst unlikely to create many casualties against a prepared force, would ensure the enemy would have to initiate personal and collective protective measures, whilst the contamination of materiel would create disruption to the supply chain. From all of this work, the War Office published, in 1940, Military Training Pamphlet No 32 Part V - *The Use of Gas in the Field* and the *Chemical Warfare Pocket Book*.

In April 1940, the GHQ Operations Staff wrote a detailed paper, classified as MOST SECRET, entitled *The Offensive Use of Gas*.<sup>82</sup> This sensitive document took some time to do the rounds but was supported by another (GR/633/0 dated 9 May 1940) on the subject of confirming a coalition Gas Policy. GHQ CW was quick to comment, replying on 10 May; there was clearly considerable discussion, as the draft has a raft of pencil amendments. These documents are though, important, as they lucidly demonstrate the United Kingdom's GW policy during the first six months of 1940. First and foremost, there was an explicit statement, reiterating the base line planning assumption, that the Allied Governments would not sanction the employment of gas until clear proof had been obtained that the Germans had used gas against Allied Forces. Two important implied tasks fell out from this ban on first strike: confirmation that chemical weapons had been used deliberately and the dis-

semination of this information to the relevant Governments. The execution of these tasks in a timely and accurate manner was essential to ensuring that political direction could be given; both activities are still relevant today. The first task involved identifying the substances, and assessing the tactical scenario in which, they had appeared. This was particularly important because according to the *Handbook on the German Army*, the fumes generated by some German explosives could initiate respiratory irritation and skin damage, which could easily be mistaken for the effects of blister gas exposure.

To execute this work, the BEF had two key assets. An Anti-Gas Laboratory (AGL) deployed with GHQ in September 1939, with the technical staff drawn mainly from civilians at the Chemical Defence Research Department who were on the Supplementary Reserve. It had a clear defensive role in ensuring that British defence measures could effectively respond to German offensive systems,<sup>83</sup> but it was equally important in setting the scene for offensive action, although the *Official History* makes little mention of this aspect.<sup>84</sup> Prepared for semi-static conditions, much of its equipment was difficult to move, a problem exacerbated by a shortage of suitable transport, and it withdrew through Boulogne on 21 May 1940, having destroyed most of its stores. GHQ Chemical Warfare intelligence was collated by the relevant staffs at Division, Corps and GHQ to the One Star appointment of Director Chemical Warfare. Each divisional, Base and Line of Communication Area headquarters had a GSOII(CW) a GSOIII(CW) and a chemist who was a Captain on the General List. The GHQ CW Directorate had two branches. Operations and Intelligence with a GSOI(CW) GSOII (Int) and GSOIII(CW)<sup>85</sup> and a Technical branch, with chemists and a physiologist, which controlled the AGL. The *John Harvey* incident at Bari in December 1943, referred to above, reinforced the importance of ensuring that mistakes were not made. For a period of time, once mustard had been identified, it was thought that the Germans might have initiated gas warfare; fortunately the evidence was carefully analysed.\*

The second concern, expressed by the Chemical Warfare Joint Planning Committee, was the importance of agreeing a Coalition Gas Policy, as the BEF Staff view was that GW must be an Allied activity. There were many points arising from this issue, not least of which, was the affect of GW upon the civilian population in France. The French had a growing and increasingly capable SW inventory, the bulk of which was ground-based, whilst the British Main Effort in 1940 was air delivered. The French, although very interested in the High Level Spray (HLS) technique, testing it in the Sahara in a joint

trial with the British, were understandably concerned about using it on French territory. The French GW planners were cognizant of the possibilities of the complimentary systems but HLS was not an aspect the General Staff or the politicians had their minds around. Nonetheless, the planners discussed how these two systems might be utilized to best effect, and thus generate the greatest synergy. British Air Delivered Special Weapons (ADSW) and especially HLS, were central to this debate, because of the probability that the Germans would construe chemical harassment of Third Line units in Germany as an attack upon the civilian population and respond accordingly. A War Office document summarized the problem:

*High spray is necessarily an indiscriminate weapon, and demands extremely correct meteorological information, together with a reasonable [sic] high standard of training if the spray is to be delivered on the objective. Even though the spray is directed against concentrations of troops it is certain to effect [sic] civilians in or near the area attacked.<sup>86</sup>*

The GW planners were therefore, left with a reorientation of their plans, and their attention turned to another option. HLS was to be used against any German Forces operating in Belgium and Holland, a military convenient solution because the Belgians and Dutch were not part of the Franco-British Alliance, and they were not therefore, invited to comment upon the proposal. Whether this concept was passed to the War Cabinet for approval, and if it was, whether the relevant governments were approached, the BEF documents do not reveal.

The third aspect was the BEF's ability to conduct GW, which in the view of the experts was limited. At a GHQ meeting on 9 April 1940, Brigadier Ling (DDSD (RE & CW)) at the War Office stated that, in his view, the Army would not be capable of using gas offensively until 1941, and this was summarized in paragraph 5 of the minutes.<sup>87</sup>

*The present situation as regards the supply of gas for the BEF is such that it is unlikely that any appreciable results would be obtained from its employment at present, except by high spray at night, and the latter would only be possible on a limited scale.*

In April 1940, the BEF's ground delivered gas capability was tactically focused, being restricted to small shoots and the contamination of demolitions. The RAF were capable of delivering chemical at the operational level, but at high intensity, with gas being 25% of the air delivered effort, there were only sufficient stocks for seven days. Stocks could have been

\* US mustard was notoriously cough, German was renowned for its purity. - Ed

conserved by lowering the daily air SW effort but the consensus of opinion was that enemy should be attacked as hard as possible. HQ Advanced Air Striking Force (AASF) wrote a cogent and erudite document, on this subject, entitled Memorandum on the Use of Gas by the AASF,<sup>88</sup> which covered many important aspects. The first one focused on the significance of maintaining momentum in chemical operations, which led to a major debate that was never satisfactorily resolved whilst the RAF was in France. Should SW be used en masse with as much surprise as possible, in order to produce a shock effect, or would it, given the limits on stocks, be better utilized sparingly on specific targets, to produce long term degradation? The proponents of mobile operations believed, strongly, that air SW should be used to slow a major enemy breakthrough, although HQ AASF reinforced the fact, that gas could not deny ground. For the Air Officer Commanding (AOC) AASF to make this statement is a highly significant comment upon the command relationship between the Army and the RAF. It clearly illustrates that the AOC understood the limitations of ADSW in Land operations but it is possible that GHQ believed that it was a snipe at their competence.

The effect of ground based SW employment upon civilians was a most important consideration, and there was much discussion on this sensitive issue. Whilst gas had been used widely on the Western Front during the First World War, the area of operations had been confined to the battle area, which, for most of the war, was confined to specific areas within Belgium and France. As few civilians resided in these areas, the effect of gas upon the population had not been a major factor in planning its employment, although from August 1918 onwards, the mobility introduced by the Allied advance generated more caution in the use of gas weapons. The planners adopted similar concepts in 1940, as they perceived that operations would consist of static and mobile phases, with gas weapons being utilized to support both. The introduction of ADSW created though, a scenario that had not been present in the First World War, and one, which created the planners and politicians a problem. The United Kingdom plans to provide against a German strategic gas offensive indicated grave concern about the impact of ADSW upon a civil population, an aspect reinforced by reports of the Japanese using gas in China, but there was no practical experience by which to measure its detailed effects. The GHQ Staff therefore developed an escalatory plan based upon a sliding scale of acceptability, depending upon the situation. The use of ground contamination bombs and chemical mines, offered, because of their accuracy, the least potential for civilian casualties, and were particularly useful during

withdrawal. Artillery gas strikes were much more hazardous, but would only be used in the battle area, from which it was believed that many civilians would have left. From the Army perspective therefore, civilian casualties resulting from the use of gas were expected to be relatively small. A significant factor in limiting civilian casualties would have been the lack of downwind hazard associated with mustard (except in the case of SCI).

Despite the restricted capability of the BEF's offensive and defensive GW systems in 1940, there was one component of the German Army that was especially vulnerable to GW – their logistic system. In 1940, apart from the mechanized and motorized divisions, a sizeable proportion of Second Line Combat Service Support (CSS) operations relied on Horse Transport (HT) and the British planners recognized these activities as a 'Target Rich Environment'. By May 1940, the BEF's ability to deliver a stunning blow to this critical element was non-existent, and given the perceived German GW capability, the British decided to use their SW in retaliation only. It is interesting to speculate what might have occurred had the BEF had a powerful offensive and defensive GW capability. The pressures to use it would undoubtedly have been great, and delivered at the right time and place, it could have prevented the German follow up divisions from securing the flank and changed the course, not only of the Battle for France, but of history itself.

#### Blighty Run

At 2100 hours on 21 May, with German armoured forces on the Channel Coast, HQ 21 BAD received information from the Chief of Staff (COS) at 2 Base Area,<sup>89</sup> that all Special Weapons were to be returned to the United Kingdom, or moved to other locations in France. Whilst the planning was being executed for this, the AF C2118 of 22 May 1940, recorded an incident which the Officer Commanding could have done without. Two officers were involved in a fight, which resulted in one of them being placed in arrest; the pressures of operations had begun to take their toll. Outloading began almost immediately but it took an Auxiliary Military Pioneer Company and a Docks Operating Company until 26 May to move the 1,800 tons from the depot. Most of the stocks were dispatched to the United Kingdom, through Fecamp, with the balance being sent by train to other depots in France. Most published sources indicate that all the BEF's gas weapons were eventually recovered to UK or dumped at sea (leaking weapons) although the *Official History* has a different emphasis on events, stating that: 'the major part of our stocks of gas weapons were evacuated from France'.<sup>90</sup> Tucked away in a file<sup>91</sup> at the PRO, there is an intelligence report<sup>92</sup> that sup-



ports this suggestion. Paragraph 65 of CSDIC (UK)/SIR 14 dated 3 July 1943 states that:

*some of our own chemicals fell into the hands of the enemy after Dunkirk and were extensively studied.*

Unfortunately, the report does not state which types or quantities were involved but given the effort to clear 21 BAD it is improbable that the weapons came from this site. More likely, the Germans acquired these SW from another BAD, or perhaps an ARII.<sup>93</sup> The CW Companies lost all their Livens Projectors but a special effort was made to evacuate the SCIs<sup>94</sup> as it was believed that the system, and the capability, was unknown to the Germans. Only two were left in France, both of which had been given to the French for experimental purposes. On 27 May, 15-20 parachute troops were seen four miles West of what had been 21 BAD; the clearance had been completed with little time to spare. The decision to remove the BEF's chemical retaliatory capability from Theatre was driven by the political and military consequences arising from their capture. Such considerations far outweighed the possibility that it might be necessary to reply in kind and the recovery became a priority activity.

**Storage of SW in UK.** The RAF's Special Weapons were initially stored at RAF Harpur Hill, three kilometres South of Buxton in Derbyshire, before some were dispersed to operational sites.<sup>95</sup> The Livens Drums, and 6lb Ground Bombs when they were received ex-factory, were stored at Bedale, Longtown, Savernake and Shefford, whilst the 4.5- and 6-inch shells were despatched to Longtown. As the BCVs came into service, they were initially stored at Savernake. Throughout the evacuation from Northern France, with the Special Weapons being returned to the United Kingdom, the BEF relied on the RAF in UK to provide the retaliatory capability. Blenheim IV aircraft, based at Detling, apparently undertook this task but further research is required to confirm this from documentary evidence, if it exists.

### Conclusion

The preparation for gas warfare by the BEF and the RAF, is a little known aspect of the 1939-40 campaign in France. There has been a perception over the last 60 years that the British GW capability in France was purely designed for retaliation. The documents clearly indicate though, that whilst the size of the GW assets were initially relatively small, there was a concerted effort to increase the British capability as quickly as possible, and to employ them effectively. To that end, the GHQ CW Staff was tasked with assessing the utilization of the new weapons as they were

sent to Theatre. In their assessment of the GW balance, the GHQ Staff knew that the BEF's capability did not match that of the Germans, and that although there might be tactical advantages in the defence from employing gas weapons, the BEF would, operationally, be on the back foot. In addition, there were very grave strategic implications should the tactical or operational use of gas weapons prompt the Germans to initiate gas warfare against the civil population of France or Britain.

Given the critical shortage of Army gas weapons, the BEF relied heavily on the untried capability of air delivered gas munitions. The reliance on these weapons had developed as part of the emphasis placed upon the strategic deterrent being the preserve of the RAF. Whilst most observers have seen the deterrent as being purely the delivery of High Explosive, it was a triad of capability as the documents reveal that RAF planners foresaw HE being complemented by incendiaries and gas. Not surprisingly, this process was carried across into the operational and tactical environments, and, as assessments of potential ground tactical scenarios were completed, the need for Army gas systems was reinforced, and every effort was made to introduce appropriate weapons as quickly as possible. Indeed, from the escalatory perspective, there was an imperative to so do. Whilst the use of ILS was deemed at the time to be the most effective retaliatory response, it carried the greatest risk of strategic escalation; the tactical deployment of ground gas weapons would therefore, have been a more restrained solution. The use of the chemical mine at demolitions, or 6lb contamination bombs in built up areas, would have imposed delay upon the enemy if they had been used in the correct circumstances, whilst clearly demonstrating that the BEF had the capability to respond at each level. As the BEF was in defence, the bold employment of sufficient SW, had they been available, would have had an impact upon the enemy's offensive activities, and correctly used, might have disrupted his momentum sufficiently to have dislocated the German consolidation of their advance. Whilst this would have initially been of operational significance, the strategic opportunities open to the Allied Commanders could have changed the course of the war, and the history of the 20th Century.

The British Army no longer has a GW capability, and concentrates its efforts upon chemical defence, but there was a time when gas weapons were an integral part of the arsenal, and the Staff were involved in planning how to use them to best effect. The Government of Neville Chamberlain has often been castigated for its failure to prepare for war but the Cabinet believed that, however morally repugnant they might be, GW had a clear role in defence policy.



Deployment was adversely affected because production lagged behind planning but the determination of a few key people, ensured that by late 1940, the United Kingdom had not only a deterrent, but also

the ability to employ, in the last resort, an effective and graduated offensive capability. In 1940, gripping the GW initiative was deemed to be more important than seizing the moral high ground.

## NOTES AND SOURCES

- 1 A copy (No 32) of this document is held in the Public Record Office (PRO) at Kew in file WO 197/1.
- 2 Two each from No 1 and No 2 Movement Control Groups based at Longmoor.
- 3 There were also 9,932 members of the Royal Air Force. See: *History of the Second World War, The War in France and Flanders 1939-1940*, Major I. F. Ellis, HMSO, 1953, p 15.
- 4 AG Statistical Return 3/944/40 dated 2 August 1940, quoted in *History of the Second World War, The Army Medical Services, Campaigns*, Volume I, F A E. Crew FRS, HMSO 1956, p 112. Inclusive in this figure are 4,370 soldiers of the 1st Canadian Division, which did not arrive in France until June.
- 5 46 chemical agents are listed in *Chemicals In War, A Treatise on Chemical Warfare*, Lieutenant Colonel Augustin M Prentiss PhD and Major George J B Fisher, McGraw-Hill Book Company, 1937, pp 6-7.
- 6 Air Raid Precautions, Handbook No 1, *Personal Protection Against Gas*, HMSO, 1938, p 2.
- 7 *The History of the Second World War, The War in France and Flanders 1939-1940*, op cit.
- 8 *The Second World War 1939-1945, Army, Special Weapons and Types of Warfare*, Volume I, *Gas Warfare*, Lieutenant Colonel D J C Wiseman (compiler) The War Office, 1951. (Hereinafter WWII Gas Warfare)
- 9 This document was downgraded to UNCLASSIFIED by MOD D/OR 13 (NBC) 22/1 dated 28 September 1984.
- 10 For an excellent examination of chemical warfare during the First World War, see: *The Poisonous Cloud, Chemical Warfare in the First World War*, I. F. Haber, Clarendon Press, 1986.
- 11 For a history of British chemical operations during the First World War, read *British Gas Warfare in World War One*, David Richter, Leo Cooper 1994.
- 12 See: *Imperial War Museum Review No 12*, Trustees of the Imperial War Museum 1999, pp 78-88.
- 13 In 1920, the Indian Government produced a pamphlet, *Gas Warfare on the Indian Frontier*, in which the potential use of gas against frontier tribesmen is articulated.
- 14 Germany ratified it in 1929.
- 15 Even this would not be binding in extreme circumstances. Churchill was prepared, had it been operationally effective, to use GW against German forces invading the United Kingdom.
- 16 For example, the Offensive Munitions Department at Porton Down changed its name back to Technical Chemical Department.
- 17 For an analysis of the role of Porton Down in defensive and offensive operations, see: *Chemical and Biological Defence at Porton Down 1916-2000*, G B Carter, HMSO, 2000.
- 18 For an erudite assessment of British Preparations in this period, see: *British Preparations for Offensive Chemical Warfare 1935-39*, Paul Harris, Royal United Services Institute, Volume 125, No 2, pp 56-62.
- 19 It is interesting to note that in 1939 J & A Churchill of London published *The War Gases, Chemistry and Analysis*, by Dr Mario Sartori, the Chemist of the Italian Chemical Warfare Service, It was reprinted in 1940.
- 20 The Prime Minister, Stanley Baldwin, was greatly concerned by the Italian action. He was quoted in *The Times* of 20 April 1936: 'if a great European nation, in spite of having given its signature to the Geneva Protocol against the use of such gases, employs them in Africa, what guarantee have we that they may not be used in Europe?' Quoted in Robert Harris and Jeremy Paxman, *A Higher Form of Killing, The Secret History of Gas and Germ Warfare*, Chatto & Windus, 1982, p 50.
- 21 For an examination of the production of chemical munitions in the United Kingdom in the period 1938-1940, see Major T I J Toler, 'Poison Gas Manufacture in the UK', *After The Battle*, Number 79, Battle of Britain Prints International Ltd, 1993, pp 12-33.
- 22 In 1938 HMSO, published eight handbooks on Air Raid Precautions, six of which related to protection against gas. The first in the series was *Personal Protection Against Gas*. There was also a pamphlet on *The Protection of Foodstuffs Against Gas* and eight memoranda on ARP, including two on anti-gas measures. These booklets were written by staff at Porton Down.
- 23 These included: Lieutenant Colonel Augustin M Prentiss and Major George J B Fisher, *Chemicals In War, A Treatise on Chemical Warfare*, McGraw-Hill Book Company, 1937. James Kendall, *Breathe Freely! The Truth about Poison Gas*, 1938, Dr Mario Sartori (the Chemist of the Italian Chemical Warfare Service), *The War Gases, Chemistry and Analysis*, and Major General Sir Henry F Thuillier, *Gas in the Next War*, The Next War Series, Geoffrey Bales, 1939. *Gas in the Next War* was a curious title for a book, which almost entirely, focused on gas in the previous war!
- 24 CAB 4/27 CJD 1383B of 20 January 1938. See: *History of the Second World War, British Intelligence in the Second World War*, Volume 2, HMSO, 1981, p 674.
- 25 The operational level of defence was not initially perceived to be important but grew more so, as the measures developed.
- 26 *Handbook on the German Army*, General Staff War Office, December 1940, p 182. This document superseded Notes on the German Army, published in 1938.
- 27 Coded Arthur by the British, Arsenic (SA) is chemically, Arsenic Trihydride, a lethal, non-persistent agent, with a possible smell of garlic, which acts systemically by destroying red blood cells. Even in small amounts it can cause anaemia but unlike other blood agents such as Hydrogen Cyanide (AC) or Cyanogen Chloride (CK) it acts very slowly, taking hours to days to achieve its full effect; it also causes damage to the liver and the kidneys. Despite these attributes it has several undesirable properties; it is a volatile substance, which can explode on contact with air and disperses in the field very rapidly.
- 28 *History of the Second World War, British Intelligence in the Second World War*, Volume 2 op cit, p 674.
- 29 See PRO WO 193/727.
- 30 It was on 23 December 1936, that Dr Gerhard Schrader first

- tested, as part of his experiments to produce a pesticide to kill leaf lice, what was to become known as Tabun, the first nerve gas. Sarin was discovered in 1938.
- 31 *Handbook on the German Army*, p 186.
- 32 Chemical artillery rounds were used extensively to support the breakout of the British Salonika Force in operations against the Bulgarians in September 1918. See, Captain Cyril Falls (compiler), *History of the Great War, Military Operations in Macedonia*, Volume II, HMSO, 1935, pp 122-123.
- 33 A term used to describe the policy of the British Governments of the 1930s, which focused on keeping the military commitment to any future continental conflict as small as possible. For the background to the process, see Michael Howard, *The Continental Commitment, The Dilemma of British Defence Policy in the Era of Two World Wars*, Temple Smith, 1972, Chapter 5.
- 34 The minimum was a fine balance between the unrest faced by the Empire, the threat from Germany, what the French deemed to be acceptable, and what the Treasury stated was affordable!
- 35 For a detailed assessment on the military aspects of foreign policy during the period 1936-1939, see: *History of the Second World War, Grand Strategy*, Volume I, N H Gibbs, HMSO, 1976.
- 36 In 1935, the Defence Requirements Committee (DRC) had recommended a field force of seventeen divisions – five Regular and twelve Territorial. The Cabinet accepted the concept in principle but postponed, to an unspecified date, the equipping of the Territorial Army (TA). By 1937, only four out of the twelve TA divisions were to be made available to reinforce the BEF, and equipment, less two anti-aircraft divisions, would be scaled for training only. By 1938, the BEF's size was restricted to five Regular divisions by deleting the provision of TA reinforcements.
- 37 Ammunition expenditure rates for the BEF were promulgated in Plan W4 First Maintenance Project, p 18 – PRO WO197/2.
- 38 For details of Bromobenzyl Cyanide, see *Chemicals In War*, pp140-142.
- 39 It was also soluble in organic solvents such as petrol or alcohol.
- 40 *The Tactical and Technical Employment of Chemical Weapons – Military Training Pamphlet No 32* (hereinafter Pamphlet No 32): Introductory Note on every Part.
- 41 RAF SW were also stored in the brickworks next to the AASF's Ammunition Railhead at Germaine and at a Forward Air Ammunition Park (FAAP) at Nogent L'Abbesse.
- 42 Load carrying vehicles had two generic variants, The term 'truck' described load-carrying vehicles of 1 ton or less, whilst 'lorries' were load carriers of 30 cwt or more.
- 43 Pamphlet No 32, Part 1, *Chemical Warfare Units, Organization, Employment and Training* War Office, April 1940, pp 2-3.
- 44 For details, read *Gas Attack, Chemical Warfare 1915 – The Present Day*, William Moore, Leo Cooper 1987, Appendix B.
- 45 By May 1940, there were nine generic types of transport vehicles in the 1-10 ton range in field service with the BEF, with many different makes, although the 3-ton (4x2) was the predominant load carrier, making up 53% of the fleet by quantity. 4x4 vehicles were very rare in the BEF, there being fewer than 100 (0.4%) deployed. One significant impact on the expanding Army was that the BEF deployed to France equipped with a selection of vehicles from trade, and 46% of the dry cargo vehicles (1-10 tons) lost in the campaign were impressed from the civil sector.
- 46 For a detailed list of the CW ORBAT on completion of the raising of the CW Units, see *Gas Warfare*, p 273.
- 47 Barton Stacey, six miles to the East of Andover, is still utilized by the Ministry of Defence but it is a shadow of its former self. All the buildings have gone, and the site is used as a training and vehicle staging area. Few of those who use it know of its important but sensitive past.
- 48 By 1945, the United Kingdom had produced 3,394,093 rounds charged with mustard and 942,960 with tear gas. *Gas Warfare*, Appendix 2.
- 49 Total war production was 300,766 charged with mustard and 101,195 with tear gas. *Ibid*, Appendix 2.
- 50 The common term for a Livens cylinder was a drum, although it was cylindrical in shape.
- 51 The Tri-Service NBC Defence Centre at Winterbourne Gunner has an example of the Projector and an empty drum.
- 52 None were 4 x 4, thereby restricting deployment.
- 53 There are some interesting differences in figures offered by *Gas Warfare*, Vol I and *The Offensive Use of Gas*, GHQ(O) dated 10 April – PRO WO/197/72. The former (p 161) states it to be 270, the latter, 240. Harris, in *British Preparations for Offensive Chemical Warfare 1915-39*, quotes 288. I have taken the GHQ Planning Paper to be the most accurate assessment of the intended employment in April 1940.
- 54 Stocks of drums rose rapidly. There were 16,000 drums charged with mustard by 1 October, and 9,000 filled with phosgene; 5,000 were stored empty. By 19 December 1941, mustard stocks had risen to 60,000 drums and phosgene to 34,000, supplemented by 30,000 empty drums.
- 55 For system details see MTP 32, Part IV – the Bulk Contamination Vehicle, War Office, June 1940 (26/GS Pubus/348).
- 56 As a comparison, most high-pressure diving cylinders have a MOP of either 232 or 300 bar (3500/4500 psi).
- 57 By 1 October 1940, there were ready for issue, 65 equipments charged, and another 109 empty. By 19 December 1941, stocks had risen to 127 charged systems and 240 empty, 7 more than the production plan. As plans for the use of gas weapons in the defence of the United Kingdom changed, the BCVs were withdrawn from the gas ORBAT and were modified for smoke generation, being renamed, 'Apparatus, Smoke Discharge, No 2'. *Gas Warfare*, pp 247-248.
- 58 By 19 December 1941, these totals had risen to 13,000 and 27,000 respectively.
- 59 *Gas Warfare*, p 165.
- 60 Pamphlet No 32, Part 1, p 3.
- 61 In PRO documents, the RAF almost invariably describe them as chemical weapons.
- 62 The RAF was responsible for the offensive GW Main Effort and the key weapon in the operational and tactical armoury was the Smoke Curtain Installation (SCI) filled with HT or HTV Mustard, and designed to discharge High Level Spray (HLS) and Low Level Spray (LLS). There were three types: 250, 500 and 1000 lb. The reason why there were SCIs of different sizes was to ensure that the systems offered flexibility across the spectrum of the offensive aircraft capability. In all published training sources, the term Smoke Curtain Installation is used, with explicit explanations that SCI was referred to in this manner as a security precaution. Most Air Ministry (AIR) and Ministry of Aviation (AVIA) and some War Office (WO) documents in the PRO use the nomenclature, Spray Container Installation, thereby describing, with brevity, its GW task.
- 63 *Regulations for the Storage, Transport, Maintenance and Disposal of Chemical Weapons* (Code 26/2380). The Defence NBC Centre at Winterbourne Gunner holds Copy No 3544 of this declassified document.
- 64 Note in MO4 B/MI/192 dated 14 November 1939, held in PRO WO 193/716.

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- 65 *Ibid.*
- 66 There must have been some compromise on this subject, because according to *The Second World War 1939-1945, Army, Movements*, ammunition to the sum of 18,000 tons was received into the port of Fecamp.
- 67 Few people remember Hore-Belisha's time as the Secretary of State for War (28 May 1937 - 4 January 1940). His memory lives on though, through his efforts, during an earlier period as Minister of Transport, to improve road safety, when he gave his name to the Belisha Beacon, provided to highlight the presence of pedestrian crossings. During the First World War, Leslie Hore Belisha served as a Major in the Army Service Corps.
- 68 Note from DMO & PBM of 13 November 1939 in PRO WO 193/721. *The Second World War 1939-1945, Army, Movements*, compiled by Major I B Higham and E A Knighton, War Office, 1955.
- 69 For details, see: Glenn B Infield, *Disaster at Bari*, New York, 1971 and Karel Margry, 'Mustard Disaster at Bari'. *After The Battle Magazine* No 79, Battle of Britain Prints International Ltd, 1993, pp 34-46. PRO WO 193/712 contains several interesting documents including one entitled: *Toxic Gas Burns Sustained in Bari Harbour Disaster*.
- 70 No 1 BAD was located in the Forêt de Gavre, 25 miles North West of Nantes, whilst No 2 BAD was initially near Plonaret, 50 miles East of Brest. The latter moved to the Forêt de Rennes as soon as construction work was complete. See *The Second World War, 1939-1945, Army, Ordnance Services, Officers of the Ordnance Directorate*, War Office 1950, p 137.
- 71 As expansion of the force continued, the requirement for some form of Advanced Base Area (ABA) not dissimilar in concept to a Forward Support Group (FSG) became more pressing and in October 1939 work was begun to establish one in the Le Havre-Rouen-Dieppe triangle. This ABA was partially driven by the shortage of shipping, which was created by the long turnaround times between South Wales and the Cherbourg Peninsula; Southampton to Le Havre was a transportation multiplier. It was also part of a long-term expansion of the ILOC, designed to sustain up to fifty-five divisions, with a strength of approximately 2.25 million men. See: *The Second World War, 1939-1945, Army, Administrative Planning*, Colonel H W Wilson OBE TD, War Office 1952, p 3.
- 72 The SS *Clembay* survived the war, to be broken up as the *Ballygilbert* in 1959. See: Russell Plummer, *The Ships That Saved an Army: A Comprehensive Record of the 1,300 'Little Ships' of Dunkirk*, Patrick Stephens Limited, 1990, p 69.
- 73 3 BAD comprised an HQ plus 8, 9 and 10 Ordnance Ammunition Companies.
- 74 3 BAD War Diary - PRO WO 167/1177.
- 75 PRO WO 167/1179/1.
- 76 During the Second World War, gas shells were developed for the Royal Navy from 4-inch through to 8-inch, to assist opposed landing Operations. Naval warfare experience indicated that gas shells were not effective ship killers, and thus there was no naval reason to arm ships with SW. The carriage of SW aboard His Majesty's Ships during the Second World War is though, a subject that requires further research.
- 77 PRO WO 167/1179/1.
- 78 GHQ(A) A/3221(O) dated 31 January 1940 - PRO WO/197/72.
- 79 GHQ(A) 2358(O) dated 25 February 1940 held in PRO WO 167/11.
- 80 See: PRO WO 167/1175 and 167/1176 respectively.
- 81 Quoted in *History of the Second World War, The Army Medical Services, Campaigns*, Volume 1, op cit, p 112.
- 82 The Offensive Use of Gas, GHQ(O) dated 10 April - PRO WO/197/72.
- 83 Handbook on the German Army, op cit, p 186.
- 84 *Gas Warfare*, pp 103-105.
- 85 This was Captain Laycock, subsequently Major General R E Laycock Royal Horse Guards, who became Chief of Combined Operations.
- 86 PRO WO 106/1627 Chemical Warfare - Gas Policy: Meetings and Minutes.
- 87 GHQ GR/1367/SD dated 9 April 1940 - PRO WO/197/72.
- 88 PRO AIR 351130.
- 89 Proponents of Jointery will be delighted to learn that a Group Captain held this appointment.
- 90 *Gas Warfare*, p 8.
- 91 PRO WO 193/723.
- 92 This document also proves, that contrary to the War Office's assertions, and many published sources, the Allies were aware of German developments with nerve agents. Paragraph 3 suggested that Trilon (as it was called the Allies did not know it as - Tabun in 1943) was an alkyl derivative of monofluorophosphonic acid but was clear that: 'it cannot be classed with any of the other war gases as it is a nerve poison' (author's italics). There are a series of points to support this view, including the German use of scopolamine to treat pupillary contraction, the Germans believing that atropine was too strong. (*The misappreciation was of the importance of Tabun; Porton Down had done some work on mild nerve agents, eg Amiton, and dismissed them as ineffective for weapon use. It would appear that it was the significance of the fluorine content of the G agents in enhancing effectiveness which was insufficiently appreciated. - Ed*)
- 93 The Germans also discovered British reports and experimental items that had been given to the French, when their Chemical Warfare Laboratory at Le Bouchet was captured. See: *Chemical and Biological Defence at Porton Down 1916-2000*, p 51.
- 94 PRO AIR 29/990.
- 95 For details of operations at RAF Harpur Hill, see: *The Operations Record Book of No 29 Maintenance Unit - PRO AIR 29/990.*

## The British Descent on St Malo, June 1758

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THERE MUST BE HUNDREDS OF BRITISH VISITORS TO St Malo who marvel at the beautiful restoration of the Old City after fighting between German and French-US forces in August 1944 had reduced much of it to rubble, but few probably know that thrice in less than seventy years, British forces had sought to reduce the great French privateering port – in November 1693, in July 1695, and finally in June 1758. The first two belong more properly to naval history, but the third was an attempt by land, and because of its political and strategical origins and operational difficulties it merits more consideration than it usually receives.<sup>1</sup>

The St Malo plan of 1758 was to disrupt the two-year-old European land war by a powerful amphibious diversion on the French coast, thus easing the pressure France was exerting east of the Rhine upon our Prussian ally – an ally already severely beset in addition by a ring of enemies comprising Russia, Austria, Sweden and many minor German states.

Since George I's accession in 1714 Hanover had been an unavoidable and much disliked encumbrance on British policy, impeding the development of a purely Blue Water strategy. If the Electorate were overrun by France it would have to be repurchased at the peace settlement by the surrender of some British colonial prize gained in America or India. But whereas in the 1739–48 war Britain had relied upon the Netherlands and Austria (ruler of Belgium) to help protect its interests in north-west Europe, the decay in these alliances had led Britain to seek alliance with Prussia. In this present conflict the Dutch were neutral and Austria, while maintaining formal neutrality with Britain, was allied with France against Prussia, so that the Low Countries were no longer a barrier against a French attack on Hanover. After the disastrous loss of Minorca in 1756 Britain met with ill success in America, and the Hanoverian army under the Duke of Cumberland suffered outright defeat and capitulated in July 1757. Meanwhile France, Austria and Russia were grinding down the forces of Frederick of Prussia despite his frequent victories, so that Britain's dream of a colonial and maritime war while Frederick bore the strain in Europe was proving false. Would a British army have to go to the western front in Germany?

In mid-1757 a Cabinet divided over Continental involvement had accepted Pitt's project for a 'descent' on France's naval base at Rochefort on the Bay of Biscay, a project which would avoid a European commitment and yet take pressure off Hanover, a project to damage French resources for a colonial war, and an operation under British command the glory of which would redound exclusively to Britain. Admiral Hawke's fleet performed well at



Rochefort but General Mordaunt dithered and his ten battalions accomplished nothing. There followed an official enquiry and a court martial on Mordaunt, and the enquiry provided one of the impulses behind the St Malo expedition.<sup>2</sup>

Following the collapse of Hanover a desperate Frederick had sent Prince Ferdinand of Brunswick to rally the western flanks. Frederick now begged Britain to send troops to Germany or, failing that, at least to 'descend' on Calais, Boulogne or L'Orient with up to 25,000 men, as such a force could menace Paris and draw 30,000 Frenchmen from Germany.<sup>3</sup>

In April 1758 Britain formally undertook to make another descent on France. A plan was drafted and troops were alerted. The choice of commanders fell upon two of the officers who had formed the board of enquiry into the Rochefort fiasco, the 52-year-old Charles Spencer, third Duke of Marlborough, who was Master General of the Ordnance, and Lieutenant General Lord George Sackville, aged 42, his deputy at the Ordnance. Both had formally stated that with more positive military leadership the Rochefort expedition might have achieved its objective.<sup>4</sup>

Marlborough was, according to Lord Hervey's mordant description, a man of no great significance,<sup>5</sup> but at least he had served with credit in Germany in the last war, commanding a brigade at Dettingen. Sackville, a son of the Duke of Dorset, had fought bravely at Fontenoy and in charging into the French ranks had been severely wounded. It is therefore fair to say that in conventional land warfare their record was respectable, though their aptitude for the special demands of amphibious warfare was totally untested. The Duke was recognised as being influenced by the more able Sackville, who indeed had been a Pittite candidate for the post of Secretary at War. They had censured Mordaunt's want of enterprise: what were their views on Pitt's new project?

In early May 1758 the C-in-C (FM Lord Ligonier), Marlborough and Sackville submitted their military proposals in compliance with the government's demand for a 'descent', and they make curious reading (see Appendix 1). The authors avoided any opinion on the merits of descents on the French coast, although they did point out that the government would be committing 'a considerable part of the Army' to the 'plan of diversion': they dealt solely with the best means of executing that policy 'if His Majesty should be pleased to direct its being undertaken'. George II was greatly interested in military operations but had no high opinion of 'descents'.<sup>6</sup> They noted that the intention was

*'to cause such a diversion of the forces of the enemy as may influence the grand operations of this campaign'*

in Germany, and that the point chosen had to be close enough to Britain for troops to be brought home rapidly in case of need (to reach Rochefort had taken two weeks' sailing time).

They reported that there seemed 'nothing so advisable as the attempting a descent upon the coast near St Maloes' as it was likely that the city 'could fall into our hands'. We know from Ligonier's correspondence that much local information had been gathered from various sources, including seamen from the Channel Islands, but what that information was it is now impossible to discover - Ligonier and Marlborough later claimed it to be wide of the mark.<sup>7</sup>

The officers believed there to be a high 'degree of probability' of St Malo surrendering, provided that no French encampment or large body of troops was near the intended landing place; for though the city could not be besieged in the normal manner due to its physical situation, mortar bombardment with red-hot shot and incendiary shells ('carcasses') could set it on fire. Its water supplies could be cut off and the re-supply of provisions largely prevented (presumably by British naval patrols and British troops holding adjacent headlands and fishing villages). The walls could probably be scaled. The inhabitants or garrison might well surrender to forestall fire and destruction. The city thus swiftly and easily taken, British forces would hold it knowing that a retreat by sea was 'effectually secured', so that only 'a powerful army' could dislodge them.

Even if the principal target could not be captured, nevertheless they perceived a secondary prospect by which, provided a superior force of regular French troops was not nearby, the British could build an entrenched position in touch with the sea and still 'raise contributions, burn the shipping at St Maloes and spread an alarm thro' the country' so that the French would have to march against them. Once the British could no longer hold their entrenchments 'with prudence', they should embark and threaten the coast in such fashion that a great force would be immobilised and 'in some degree prevent' French operations elsewhere.

Pitt immediately endorsed the plan and issued his instructions to the naval and military commanders. He stressed a variety of aims: forcing the French to divert large forces from Germany to the coast, destroying their navigation and trade, and damaging their economy.<sup>8</sup> As we shall see, the very modest achievements of the expedition would be presented by both soldiers and politicians as having satisfactorily fulfilled such instructions, but the fundamental objective was defined by Pitt's fellow Secretary of State, Lord Holderness, in a letter to Ferdinand of 5th May 1758:

*To make a diversion useful it must be lasting, and accordingly we are seeking a place whence we can seriously hurt the enemy and maintain ourselves against a superior force, while keeping open our communications with the sea. (My emphasis).<sup>9</sup>*

Pitt later claimed that the military plan was entirely the generals', but the shrewd former Lord Chancellor, Hardwicke, said at the time that Pitt had worked very hard to induce them to admit that there was 'a degree of probability' of success, a comment confirmed by the First Lord of the Admiralty, Lord Anson. The generals' opinion certainly expressed no enthusiasm for coastal descents as such; even their appraisal of St Malo contained some very large and unqualified assumptions more understandable in a civilian than a military paper. Furthermore, the highly intelligent Sackville, who took the trouble to read Burchett's naval history of King William's War (republished in 1720) which dealt with the attacks of 1693 and 1695, told Hardwicke that a sea attack on the city was dangerously impracticable and 'how far any other attack may be successful it is impossible to determine'.<sup>10</sup>

What is so striking about the military appreciation is the absence of real information or any critical appraisal of such factors as were mentioned. Sackville's private comment indicates one such lacuna – the total absence of any discernible naval opinion. Not only must Admiralty archives have held information on the city's harbour and defences (which could scarcely have been dismantled in recent years), but naval and merchant seamen were frequently in Breton waters. Anson had been dubious of the scheme, not least because it would require more shipping than the Admiralty thought justified.<sup>11</sup> The mischances of the Rochefort expedition in 1757 had again shown how essential were the closest relations and understanding between the armed services: 'continentally' trained soldiers like Marlborough and Sackville about to wade onto a hostile shore needed absolute confidence that the Navy would guarantee their lifeline on that notoriously savage coast. Was the Navy not summoned to concert its opinion with the Army? Apparently each service was seen as limited to its own role – the Navy to put an army ashore; the Army to look to itself once safely landed.

In strictly military terms the likelihood of the garrison of a fortified port ('of such strength and importance') tamely surrendering rather than risking bombardment and fire seems extraordinarily optimistic, even if drinking water could indeed be stopped. To block the passage of supplies carried by local seamen with a lifetime's knowledge of the shoals, rocks and tides would require the seizure of adjacent headlands by infantry and artillery, and a naval patrol. Even supposing that the French garrison could not withstand the British

attack, would not similar factors apply yet more strongly to the British once walled up in St Malo and lacking local knowledge? Would an evacuation by sea prove easy under French cannonades from the self-same headlands? If these questions were considered they leave no trace in the final document.

Pitt's handling of the sailors was unfortunate. He never liked Sir Edward Hawke and may have felt that the Admiral had taken a slightly restricted view of his duties during the Rochefort councils of war. The First Lord of the Admiralty therefore suggested as naval commander [redacted], who had certainly shown great initiative at Rochefort; Hawke should cover the expedition with the main fleet. To Anson's dismay, Pitt immediately appointed [redacted] as expedition Commodore without informing Hawke, and further instructed the Commodore to take whatever he needed from the Admiral. This hasty and apparently insulting order, sent on to Hawke without explanation, was read by him as impugning his leadership on the previous descent. He instantly hauled down his flag. Pitt's tactlessness was overcome only by Hawke agreeing to go to sea under Lord Anson, and so Anson left the centre of affairs to command the fleet covering the expedition. That in turn created a further problem. Pitt's plan required that the French fleet should be close blockaded in Brest so as not to threaten the expedition, whereas Anson hoped that the expedition would bring out the French fleet and so bring on a sea battle, and he therefore adopted an open blockade of Brest even though he was dissatisfied with the battle training of the British fleet.<sup>12</sup> This independent view of the naval role, with its objective of a sea battle and the destruction of the French (or British) fleet, can scarcely have reassured the generals as to the safety of their lifeline.

However, below Policy level much was done to ensure success. Specially designed shallow-draught landing craft were built and tested. Care was taken to train the men in landing drills and the newer battalions were carefully exercised in musketry; [redacted] and Marlborough agreed on signals and Marlborough issued detailed instructions on signals governing disembarkation procedures. The Army's outstanding engineer, Colonel [redacted] joined the expedition as QMG. Nurses and a special hospital ship were provided. There was only one insoluble problem: the transport allowance for the troopships was no more than one ton per man, a scale dictated by the short journey and the strain that the size of the force placed on the pool of transport. With space needed for horses and forage, powder and shot, soldiers had to be packed very close, so that prolonged cruising meant stifling, foul, verminous and cramped misery.<sup>13</sup>

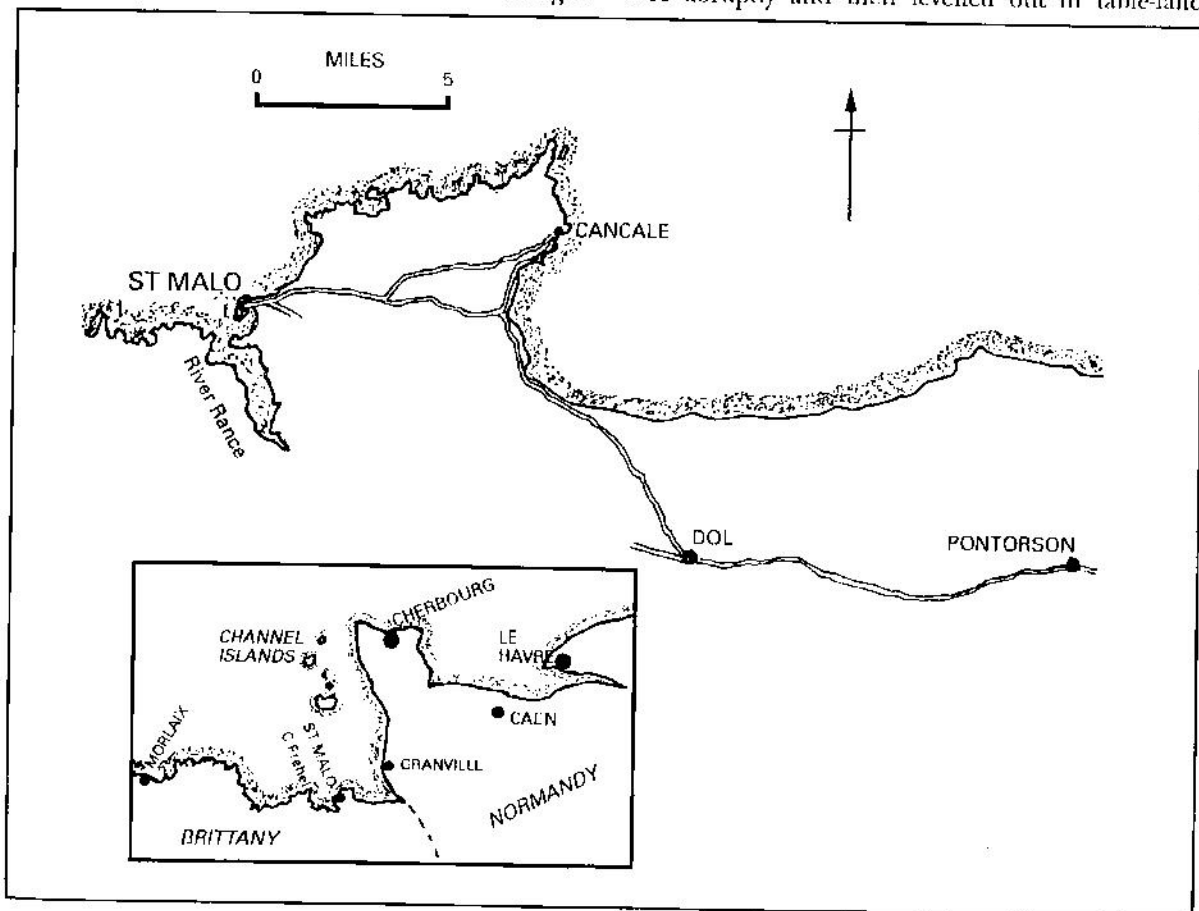
Three battalions of the Guards, twelve battalions of the Line, the nine 'light' troops from nine regi-

ments of dragoons, three companies of the Royal Artillery with some 60 field pieces and a siege train of 50 mortars: this was indeed a *'considerable part of the Army'*, stripped from the defence of Britain (see Appendix 2 for the Order of Battle). In May 1758, in addition to the strategic reserve in Britain and Ireland, and eight battalions in Gibraltar and the West Indies, Britain had some 19 regular battalions in the major theatre (America), two in support of the East India Company's own forces, and one (Brudenell's 51st Foot) in the German port of Emden. Marlborough's force would greatly reduce the infantry reserve, and its scale may be judged by comparison not merely with America<sup>14</sup> but with two European battles. Although at Blenheim in 1704 the Duke's grandfather there commanded a vastly greater allied force, his British infantry comprised only fourteen battalions; at Minden in 1759 the victory was due to a force of *six* British and three Hanoverian battalions.

The light dragoons embarked from the mainland on 24 May and the infantry from Cowes on the three succeeding days; the artillery and siege train arrived by sea from the Tower. Escorted by a squadron of four ships of the line, seven frigates, six sloops, two fireships, two bomb ketches and smaller craft, at day-break on June 1st in fair weather Marlborough's

force set sail southward from the Isle of Wight in 100 transports and ten storeships. Anson's fleet steered away westward to take up its covering station. A sudden storm blew up and a soldier of the 68th Foot has left a vivid description of the sickness below decks. The vast convoy straggled within sight of the Cotentin peninsula and at least one transport had to be taken in tow, while on 3 June another carrying some of the Guards struck a rock off the Channel Islands and the men and baggage were saved only with difficulty; The expedition dropped anchor some ten miles off St Malo at 5pm on 4 June, then next day sailed a few miles east into the bay of Mont St Michel and closed in upon its relatively sheltered western shore, at Cancale Bay. From there to St Malo it was only nine miles of undulating countryside. If the element of surprise had been lost, the British had nonetheless struck at the boundary between the widely dispersed Norman and Breton provincial commands.<sup>15</sup>

At Cancale Marlborough and Howe took a cutter inshore and were convinced that this was a satisfactory landing place. Looking from south-west to north-west from the boat they could see a humped promontory from which a long shelving beach ran northwards for about a mile to the tiny fishing village of La Houle; A little inland from the beach the ground rose abruptly and then levelled out in table-land



some 120 feet above the sea. Just north of La Houle the bay ended at the Pointe du Hock which tumbled down to the sea in land-slips and rocky outcrops: today the Pointe has a mole and a small beacon – then it held a three-gun battery of 24-pdrs. Between the battery and La Houle a narrow gully ran inland, taking a track up to Cancale village perched above the Pointe.<sup>16</sup>

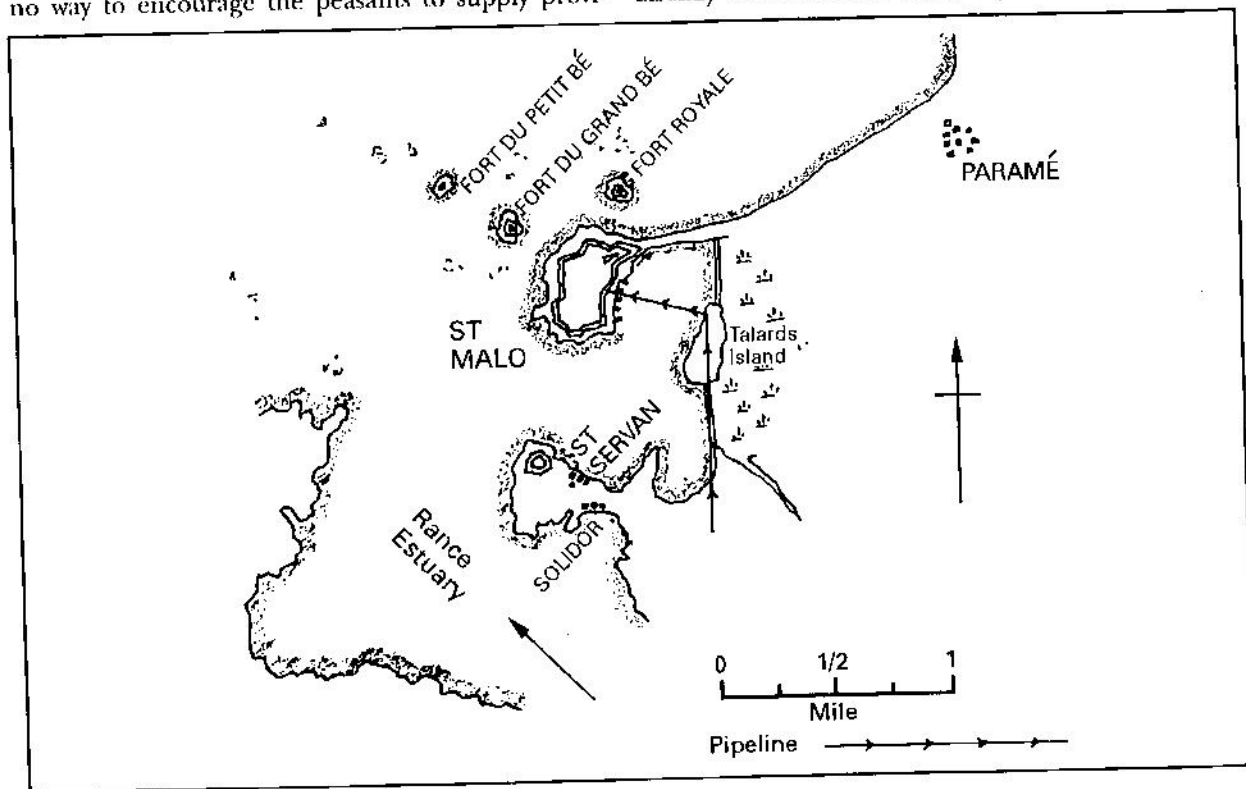
Around noon the *Essex* (64) opened fire on the battery, while the *Swallow* (14) dealt with a more distant emplacement. At 3pm Howe transferred into the *Success* (24) and with the *Rose* (24), *Flamborough* (24) and *Diligence* (14), steered to within half-musket-shot of the shore and then blasted the French guns and the small assemblage of infantry and dragoons. The special landing craft were hoisted outboard, loaded with the ten grenadier companies and sent ashore. The grenadiers rushed the gully and breasted the high ground, swept away the coastal guards and took 50 prisoners ('mostly peasants'), thus enabling the disembarkation to continue unmolested until darkness and low tide. By 11 pm the Guards and four and a half battalions had been landed. Those ashore slept under arms while their comrades remained massed on the decks of the transports. The remaining seven and a half battalions, ten short 6-pdrs and the light dragoons landed on June 6th under an 'extremely hot and scorching' sun, the last troops encamping at 11 pm; meanwhile the grenadiers and Guards had pushed somewhat further inland.<sup>17</sup>

Looting and maltreatment of villagers broke out: no way to encourage the peasants to supply provi-

sions and information. The Duke checked the trouble by hanging one man, sentencing two others to death and having the Commodore flog seven scamen round the ships. The provost sergeant was ordered to hang future offenders without trial.

At daybreak on the 7th the army marched on St Malo, leaving Boscawen's 3rd Brigade to construct fortifications around Cancale and above La Houle and thereafter to provide convoy escort. The main force marched in two columns, that of the left under Marlborough and Sackville comprising the Guards, Mostyn's 1st Brigade, the two grenadier battalions and the light dragoons all marching along 'the great road' (now the D155) while the Earl of Ancram commanded the more northerly column of Waldegrave's 2nd and Elliot's 4th Brigades, preceded by a detachment of pioneers, which took 'a very fine road but very close' (running about half a mile south of the modern D355), so close indeed that single file was sometimes necessary. The country, less bare than Picardie, less enclosed than the Norman bocage, resembles the Welsh lowlands and is much cut up by stone walls and hedges; but the British found the French troops and most inhabitants had gone to St Malo. The two columns met about four miles from the city, advanced on the village of Paramé, and camped on a west-facing frontage where the low hills fold down to the basin of St Malo, two companies of grenadiers positioning themselves in advance of the Guards and within a mile of the city.

Despite the size of his force Marlborough was already concerned for the safety of his communica-





tions. Within an hour or two of leaving Boscawen's brigade he had detached one battalion of Guards and some dragoons to march on Dol, a town fifteen miles south-southeast, on the road from Normandy to St Malo. Once there the dragoons were to push a further twelve miles east to Pontorson. The Duke seems to have taken the most pessimistic view of the strength and quality of the French regulars, coast guards and militia in Normandy and of the likelihood (or otherwise) that the Norman command would denude its own coasts to march into Brittany.

There was a further problem. The 6-pdrs had proved difficult to pull in the narrow lanes and some had mired down; therefore the heavier guns and mortars could not be brought this way. Some said that they could be hauled by road to Dol and thence another 15 miles north-west to St Malo; this could take several days, laying the train open to attack from any French forces in the hinterland. Instead, the Duke accepted [redacted]'s offer to ship them to the beach at Paramé, an offer which is the more curious as that place has a dangerously rocky approach with strong eddies and currents. Marlborough now began to study ways of seizing the city.

St Malo had for centuries traded with England when at peace, and harried the Channel ports and English shipping when at war; the Old Pretender had hoped to sail from there to Britain during the 1715 Rising. Its citizens and governor knew what to expect in war with England. As Marlborough prepared to disembark the French grouped within the walls a battalion of the line, two battalions of coastal troops, 480 militia and about the same number of armed volunteers,<sup>18</sup> but the city's best protection lay in its site. Built on a granite island and connected to the mainland by a causeway 650 feet long and (at that time) 46 feet broad, it was surrounded by massive walls built in earlier centuries and modernised by Vauban in the late 17th Century. Facing the causeway were two enormous towers dominating the main gate and immediately beside them was the self-contained citadel. The narrowness of the causeway, blown up by the defenders, made direct assault difficult and the demolition of the walls by 'battering' cannon was certain to take much time and enormous quantities of shot. Furthermore the 60-foot walls were too tall for the British scaling ladders. Batteries and forts studied the islets offshore and the run of the tides (averaging between a minimum half-knot in the neaps and three knots or more at peak springs) combined with their height – spring tides had sometimes reached 40 feet – made seaborne attack tricky. In 1692 Admiral Sir George Rooke had noted:

*The tides run very quick in the offing of the coast of St Malo's... Not one of the pilots would undertake to*

*carry in any ship of war, or fireship, to make any attempt on the French ships at St Malo, though I offered an hundred pound encouragement to each man'.<sup>19</sup>*

The promontory with the small port of St Servan lies south of St Malo, forming a bay between them with docks and stores for fishing vessels, merchantmen, privateers and men-of-war. The distance as the crow flies between the two places is a little under half a mile and thus near the limit of cannon's effective velocity, although within high-trajectory mortar range.<sup>20</sup> The south face of St Servan looks onto the Rance estuary and the tiny port of Solidor, another refuge for shipping. Mortar bombardment of St Malo from the left bank of the Rance from the very nearest point (now Dinard) would be at maximum range (the distance is a mile) and would entail hauling the mortars with a sizeable guard far away from the main army, and shipping them across a tidal estuary.

St Servan represented the one real weakness of St Malo. Despite Vauban's recommendations this village had never been fortified, though its slopes collected the city's drinking water. Since the Middle Ages submerged wooden pipes had carried water from the village to the city via the islet of Talards (which now separates the outer Vauban and inner Cartier basins): it was protected for much of its way by sea and marsh but could be attacked at St Servan. Inside the city there were many private water-tanks and a large public one at the cathedral, all hewn from the rock, and of course there was abundant sea water for all other purposes.<sup>21</sup>

At dusk and low tide on the 7th a force of light dragoons moved down to the bay between the city and St Servan and also to Solidor. Each horseman carried an infantryman with combustible materials. The night sky soon blazed as stores and ships in dock were set alight and the conflagration continued until 9 June. Even though figures differ there was general agreement at the time that all the men-of-war on the stocks were burnt (Entick says one of 50 guns, two of 36), some 24 armed privateers, 70 merchantmen and 40 small craft – and a monetary factor of damage of between £0.5 million (the French estimate) and £0.75 million (the British).<sup>22</sup> Marlborough had also proved that a hostile force on the mainland could render the port unusable, and once cannon were in place any major concentration of shipping could be devastated, even under the walls of St Malo.

The horror of the scene must have shaken the citizens of St Malo. As to the water supply there is some conflict of evidence: an officer of dragoons, writing on July 3rd about the night attack, said that the pipe was cut off, causing the citizens to panic; but another English source said that the defenders remained inactive in return for a guarantee of their water sup-

ply.<sup>23</sup> Whichever was right, the outcome was the same. The next morning (the 8th) the Duke summoned the governor of St Malo to surrender, a summons the governor immediately rejected. Another easy London assumption was proved false.

Marlborough had issued a proclamation on 7 June promising safety to the local population and calling for them to provide food supplies and contributions for the army.<sup>24</sup> It had little effect. Troops had been issued with rations on disembarking and further supplies followed them ashore (no soldier speaks of undue shortage), but a force of 13,000 men and many hundred horses (dragoons, staff, field artillery, siege train and baggage) eat mountains of bread, biscuit, and fodder: perhaps 10 tons of meal in a day and double that in fodder.<sup>25</sup>

Marlborough's problems were growing rapidly. Foragers were returning with very scant finds; but bread and provisions were ordered from the ships off Paramé. A working party of 200 pioneers under the direction of [redacted] RA and covered by 500 soldiers, was sent to prepare ground for the siege guns, which on 8 June were ordered to be brought ashore. The Guards battalion had occupied a peaceful and even welcoming Dol and pushed the dragoons beyond until three troops of French dragoons and six companies of infantry were found and two Frenchmen captured: the force encountered could not have exceeded 1300 men which was scarcely an immediate threat either in numbers or proximity.<sup>26</sup> The British detachment then marched back to Marlborough's army.

On 9 June [redacted] reported that he could not land the siege train on Paramé beach – and in any case there seems to have been a shortage of draught horses; supplies from the countryside seemed unobtainable and to cap it all the weather then turned stormy and during the night many tents were blown down and the soldiers drenched. Colonel [redacted] noted that French soldiers were being ferried into the city and added that rumour spoke of large numbers of men gathering in Brittany.<sup>27</sup>

Early on 10 June, sixty hours after reaching the city he was to take and hold 'for a considerable time' till 'a powerful army would become necessary to dislodge' him, the Duke ordered the retreat on Cancale. By evening the whole force, in perfect order and without sight of any French troops, pitched camp inside the two earth forts named Marlborough and Sackville and the hornwork named Ancram, dominating the high plateau in front of Cancale and above La Houle. Held by disciplined and trained soldiers backed by the fleet in the bay below, any attack on it would undoubtedly have failed disastrously. Here, according to their ideas in London, Marlborough and Sackville could have stayed until vastly outnumbered by enemy regular troops. Did they fear the fleet

being forced out to sea? For embarkation began on the 11th and was completed the next day. On both days the weather was so foul that the entrenchments and tracks were full of water. Only at the very last were some French patrols espied on the high ground, and not one shot was fired as the British set sail. The Duke forgot his silver spoons, which were found in the camp and returned in polite mockery by the French governor of Brittany.

From then until the 17th the army cruised, first towards Granville, then back to Cancale, then west of St Malo to Cap Fréhel; by the 26th it had gone east as far as Le Havre at the mouth of the Seine, and by the 29th it had sailed back to Cherbourg, having meanwhile looked at Ouistreham with a view to attacking Caen. Orders had repeatedly been given for landing craft and Guards and grenadiers to be ready for assault, but the contrary winds and weather, the shallowness of the Arromanches waters, the growing discomfort and sickness on board, and the gradual exhaustion of provisions (despite some re-supply from England), were more serious impediments to action than the sight of French coastal troops and armed civilians. On 1 July 1758, after 17 days cooped up, buffeted by choppy seas, with almost all the hay eaten, with rations running low and increasing sickness, the great expedition reached England. On 6 July the infantry landed on the Isle of Wight and the dragoons returned to Petersfield. Losses had amounted to about 30 men missing; French losses at Cancale on 5 June and near Dol a few days later can have come to little more.

To their relief, the anxious generals found that the government was ready to publicise the St Malo burnings as a complete fulfilment of its instructions. Moreover they discovered opinion in England turning increasingly towards involvement in Germany, where Prince Ferdinand's German troops had enjoyed marked success. In consequence a British contingent of twelve (later fourteen) squadrons of cavalry and five battalions of foot were ordered to Germany. A unit of 400 Invalids went out to release the 51st Foot from garrison duty at Emden for field service; Marlborough and Sackville hastened to abandon what the latter termed their 'buccaneering' for a regular land command and went out with the force, taking with them three of the more senior St Malo battalions (20th, 23rd, 25th) as well as Major General Waldegrave and [redacted]. Any further plans Pitt might have for large-scale coastal operations would have to be implemented by other generals.<sup>28</sup>

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DESPITE THE GOVERNMENT'S CLAIM, INFORMED OPINION soon fastened on the story of the Duke's silver spoons, and in the following year the reports of