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SELECTED GLOSSARY

ACSEA	Air Command South East Asia
ADW	Airborne Delivery Wing
AFB	(US) Air Force Base
AVG	American Volunteer Group *aka* 'The Flying Tigers'
BAF	Balkan Air Force
CBRN	Chemical, Biological, Radiological and Nuclear
CSE	Central Signals Establishment
CSRO	Combat Survival and Rescue Officer
Det	Detachment
D/F	Direction Finding
DCO	Director of Combined Operations
DSF	Director Special Forces
DZ	Drop Zone
ELAS	*Ellinikos Laïkos Apeleftherotikos Stratos* (Greek People's Liberation Army)
ELINT	Electronic Intelligence
GOC	General Officer Commanding
GPR	Glider Pilot Regiment
HAHO	High Altitude High Opening
HALO	High Altitude Low Opening
JSCSC	Joint Services Command and Staff College
LFA	Land Forces Adriatic
LRDG	Long Range Desert Group
LZ	Landing Zone
OC	Officer Commanding
ORB	Operations Record Book
ORP	Operational Readiness Platform
PEdO	Physical Education Officer
PJI	Parachute Jumping Instructor
PTC	Personnel and Training Command
PTS	Parachute Training School
QWI	Qualified Weapons Instructor
SBS	Special Boat Section
SD	Secret Document
SF	Special Forces
SIGINT	Signals Intelligence
SIS	Secret Intelligence Service *aka* MI6.
SOE	Special Operations Executive
TRE	Telecommunications Research Establishment
VCP	Visual Control Post

THE RAF AND AIRBORNE FORCES

RAF MUSEUM, HENDON, 9 APRIL 2014

WELCOME ADDRESS BY THE SOCIETY'S CHAIRMAN

Air Vice-Marshal Nigel Baldwin CB CBE

Ladies and Gentlemen – good morning.

It is a pleasure to welcome you to our first meeting this year. We are going to spend the day looking at how the Royal Air Force and the British Army have worked together in attempting to inject airborne forces into the battle area. But before we begin, as always, I must say how grateful as a Society we are for the help and the facilities we continue to receive from Air Vice-Marshal Peter Dye and his colleagues here at the RAF Museum.

But also before we begin, some of you will not have heard that Dr Jack Dunham, our Membership Secretary for nearly 20 years, died earlier this year. He had been ill for some time but, almost to the end, continued to correspond with our members. We all owe him a considerable amount. Our editor will place a suitable notice in the next Journal meanwhile Wg Cdr Colin Cummings has taken over Jack's responsibilities. The website has been changed to reflect that. While mentioning the Society's website, it has recently been re-vamped and now most of our seventy or so publications going back to 1986 are much more easily downloadable.

Our Chairman today is unusual by our standards: it is the first time we have ever invited a soldier to guide the day but in General Sir Rupert Smith we have a British soldier who fits the bill admirably.

He is the son of the New Zealander Gp Capt Irving Smith who flew Hurricanes in the Battle of Britain and later, in 1944, as a wing commander, led the historic Mosquito raid on the German prison at Amiens.

Sir Rupert retired from the British Army in 2002 having been DSACEUR – Deputy Supreme Allied Commander Europe – where he was closely involved in NATO's operations in the Balkans having previously been Commander of UNPROFOR – the United Nations Protection Force in the former Yugoslavia. Before that he had been GOC Northern Ireland, Assistant Chief of the Defence Staff for Operations in the MOD, and, as many of you will recall, the GOC of

1(UK) Armoured Division in the early 1990s not least in the first Gulf War. When he retired, he wrote a book, *The Utility of Force – the Art of War in the Modern World*,[1] which is now recognised as a masterly analysis and account.

But before all of that, after Sandhurst as a very young man his first commission was as a 2nd Lt in the Parachute Regiment and he then served in Africa, the Caribbean, Northern Ireland, Europe and Malaysia. In the 1990s, he was Colonel Commandant of the Parachute Regiment – which brings us nicely back to today.

I am sure he will be able to keep us on track.

Sir Rupert – you have control

[1] Smith, General Sir Rupert: *The Utility of Force – the Art of War in the Modern World* (Allen Lane, London, 2005).

ORIGINS AND INFANCY OF THE CENTRAL LANDING SCHOOL, RINGWAY, AND THE TRAGINO AQUEDUCT RAID

Nicolas Livingstone

Nick Livingstone served as a Light Infantryman before leaving the Army to read English at Warwick University. Careers followed in educational publishing and IT systems development. His father had flown as a WOp/AG with No 1419 (SD) Flt and No 138 Sqn which led Nick to delve into the origins and early history of the Special Duties units operating for SIS and SOE. There is much common ground shared with the development of Airborne Forces, hence this paper.

At the end of June 1940 Britain was alone. Britain had no airborne forces – no parachute troops, no glider troops and, except for in the Middle East, no air-trooping capability. Germany possessed all three, so why not the British? To find out we need to go back to the Great War.

Before 1918 the parachute's military use had been confined to crewmen fleeing a burning observation balloon, to a few brave agents dropped from biplanes by moonlight over the green country behind the opposing lines of trenches, and, from mid-1918, to German aircrew. In October 1918 the American Brigadier General Billy Mitchell conceived a plan to parachute the US 1st Division behind the German lines to capture the French city of Metz in the following spring. It would have required quantities of aircraft, parachutes and trained troops that did not exist, but it was certainly imaginative. Mitchell's plan was rendered redundant by the Armistice.[1]

Post-war devastation – economic, physical and moral – stifled the development of military technologies for most of the 1920s. Military budgets were slashed, but by 1927 Italy, which had pioneered the insertion of agents by air in 1915 (though not by parachute), was experimenting with parachute troops. The Soviets, political control uppermost in their priorities, soon realised that parachute troops could be despatched quickly to quell domestic unrest, overcoming their vast

Between the wars, the RAF maintained a limited capability to move troops using a series of bomber-transports, like this Victoria.

country's lack of transport infrastructure. Soviet parachuting was promoted as a sport to produce a healthy proletariat, young and old, and in military exercises in 1935 and 1936 Soviet generals demonstrated to foreign observers how massed drops of parachute troops could seize an enemy's rear strongpoints. The senior British observer, Maj Gen Wavell, noted the vulnerability of newly-landed parachute troops, and dismissed their tactical possibilities. The British army went back to sleep, while the Germans, French and Italians continued developing their parachute troops. In 1936 they were joined by the Poles.

In Iraq, meanwhile, the RAF had been air-lifting troops and equipment to trouble-spots throughout the 1920s and '30s in support of the policy of Air Control. In 1923, against the serially rebellious Sheik Mahmud and his Turkish backers, two companies of infantry were airlifted from Kingerban to Kirkuk, their six-stage ground route barred by heavy rains. The Vickers Vernon, and its successors the Victoria and Valentia, were used to transport equipment and rations by air to mobile columns and outposts, evacuating casualties on the return, although, as Jeff Jefford has pointed out in an earlier journal,[2] emplaning troops sometimes had to be educated not to stick their bayonets through the fuselage walls.[3]

The Germans proved to be the Soviets' adept pupils. The Versailles Treaty had forbidden Germany an air force, so Germany developed transport aircraft that could be converted to carry a light

bomb load. The Junkers Ju 52 airliner of 1930 turned out to be well-suited to airborne operations: it was slow, with a large side-door, and it was built in quantity. Versailles had also banned the training of new pilots, but gliding was permitted, and encouraged by the state. By 1930 Germany had a cadre of glider-trained pilots for a future German Air Force, and a lead in glider design it has rarely lost. General Kurt Student developed the concept of the 'airborne envelope' to exclude enemy forces during the first vulnerable stage of an airborne attack. The *Luftwaffe's Fallschirmjäger* were denied their operational baptism in Czechoslovakia by the Munich Treaty, but they tasted success in the invasions of Denmark and Norway. A month later in the Low Countries the impact was greater: the glider-borne assault on the Belgian fort of Eben Emael made world headlines, but the German airborne attempt to capture Den Haag's three airfields resulted in failure and catastrophic losses. The Dutch, learning from Norway, had been ready for them.

But why, while these European powers were developing their airborne forces, had the British sat on their hands? In a nutshell, the British had not seen a need for them. Airborne forces are primarily weapons of attack – to take a tactical objective and hold it until relieved, or to seize a pinpoint objective briefly for sabotage. In defence they become infantry whose chief value lies in counter-attack. After September 1939 Britain's military strategy against Germany remained essentially defensive, based on naval blockade, diplomatic and economic pressure, and a static military defence in the West.[4] The appalling losses of the previous war had rendered an unprovoked military offensive against Germany politically unthinkable, although Bomber Command was permitted to sink the German Fleet. In June 1940 Churchill's demand for parachute troops was consistent with his novel requirement for small-scale offensive operations to keep the Germans off-balance, but neither had been thought necessary before German forces had gained the Channel coast.

The formation of Britain's Airborne Forces

The early story of Britain's airborne forces has most often been told from the perspective of Ringway and the early parachute and glider troops. This version tells of a gallant struggle against the bureaucracy of a reactionary Air Ministry which did not want

parachute troops. This is not exactly untrue, but I intend to provide a more nuanced narrative.

The widely-accepted history[5] starts on 22 June 1940, with Churchill's demand for 5,000 parachute troops. True, up to a point.[6] Nineteen days earlier, on 3 June, Churchill had written to Gen Hastings 'Pug' Ismay, Secretary to the Chiefs of Staff, asking for offensive raiding operations against the enemy coast. The next day in the Commons, as the last troops were being plucked from Dunkirk, Mr Frederick Cocks, a Labour MP, asked the War Secretary, Mr Anthony Eden, whether he intended to organise a corps of parachutists and gliders. George Garrow-Jones (later Lord Trefgarne) pounced on Eden's evasive answer to ask 'whether this form of warfare, which has been experimented on by foreign armies over the last three years, has been equally studied by the British War Office?' Mr Eden replied that his earlier reply had referred to recent operations, which were now being studied.[7]

A little later in the same sitting, Churchill made his 'We shall fight on the beaches. . .' speech, which included the statement: 'We shall not be content with a defensive war.' Whether he had been present to hear the earlier exchange, he wrote to Ismay again on the 5th about five offensive actions he wanted taken, of which the fourth-listed was, 'Development of parachute troops on a scale equal to 5,000.'[8] Churchill asked the Chiefs of Staff to brief him three days later on their plans. The Chiefs of Staff asked to brief him in person, due to their plans' secret nature, and they did so in a late-night visit on the 9th. On 14 June, the day that the Germans entered Paris, the Chiefs of Staff appointed Lt Gen Alan Bourne,[9] Adjutant-General of the Royal Marines,[10] to be 'Commander of Raiding Operations on coasts in enemy occupation and Adviser to the Chiefs of Staff on combined operations'. They assumed that Churchill would be preoccupied with France's final agonies, so they didn't inform him, and issued Bourne's directive on the 17th.

Bourne condensed his original mouthful of a title to the more manageable Director of Combined Operations (DCO), and this appears in all subsequent correspondence.[11] On the 18th he issued a Memorandum on Offensive Operations.[12] It demonstrates that not only did Bourne have a substantial grasp on the subject, he had already started turning the handle. His headquarters staff was named, the

structure of his force laid out, and so were his requirements: 214 landing craft (of which only seven existed) from the Royal Navy, ten 'Independent Companies' of 200 men and 10 commandos of 500 men from the Army, and a Parachute Training School and six Whitley aircraft (4 IE + 2 IR)[13] from the RAF. Of parachutists he wrote:

> 'The remaining Commandos, each of about 500 men, are in course of formation. I would like to aim at a total of 5,000 to start with. Parachutists should be taken from volunteers in the Commandos.'

General Bourne had been loaned a Deputy Director (Air) in Gp Capt Geoffrey Bowman DSO MC* DFC, a First World War ace with 32 victories. (Twenty-three years before, as a Flight Commander with No 56 Sqn, 'Beery' Bowman had been one of the six 'aces' who had fought Werner Voss to his gallant death.) Bowman had other duties at the Air Ministry, but from 1 July he acquired an assistant: Sqn Ldr E V Knowles had been posted from North Weald, where he had commanded No 56 Squadron in the battle over Dunkirk. Their priority was to set up Bourne's parachute school. Bourne estimated optimistically that 'up to 200 drops a day' could be made, and asked that the whole of the Whitley group – presumably No 4 Group – should be regarded as available for offensive action: he calculated a potential force of 1,152 fully armed men, plus 96,000 lbs of stores. He gave no indication of how many aircraft this represented, but standard sticks of eight would have required 144 Whitleys. Bowman and Knowles were also responsible for (as the Plans War Diary put it) 'certain other "irregular" activities that need not be specified.'[14] Sqn Ldr Knowles would play a crucial part in the creation of No 419 (Special Duties) Flight, formed on 20 August 1940 to insert and recover SIS agents by air. From March to November 1941 he would command the flight (renumbered as No 1419 Flt) and its successor, No 138 Sqn.

To command the Parachute Training School, Bowman lined up a suitable candidate in Sqn Ldr D R Shore, also known as Ross-Shore. A 29-year-old career officer who had lately become involved with the technical development of parachutes, he was with 'RDQ1' under the Ministry of Aircraft Production, based with the Parachute Development Unit at Henlow. On 19 June Shore was 1,500 feet above


The two men whose contribution was critical to the development of a British airborne capability. Left, Louis Strange as a wing commander and, right, John Rock as a lieutenant colonel.

Bassingbourn, performing a 'pull-off' parachute descent from an improvised platform at the tail of a Whitley. Shore landed badly, and was concussed enough to be put out of action.[15] Bowman had to look for a replacement Commandant at short notice. Meanwhile the posting orders were going out.

All of these events had taken place before Churchill's much-quoted '5,000 parachute troops' demand of 22 June.

On 24 June, Plt Off Louis Strange DSO MC DFC*, arrived at Ringway from No 24 Sqn. He had no idea why he had been posted there, and no one there, not even the Station Commander, Gp Capt Blackford, could tell him. Over the next few days Flt Lt A J O'Neill DFC, arrived from No 58 Sqn, and Maj John Rock, a Royal Engineer who had, at least, been told to start a parachute school. In an attempt to get to the bottom of the mystery, Tony O'Neill, as the senior RAF officer, borrowed a Leopard Moth on the 28th and flew Strange, via Henlow, to Hendon. Strange flew the Leopard Moth back to Ringway while O'Neill made enquiries at the Air Ministry. O'Neill drew a blank.[16]

On the 29th Strange flew alone to London. At the Air Ministry he was redirected to the Admiralty, where he found Gp Capt Bowman, an old friend, trying to extract a replacement for Sqn Ldr Shore from Personnel Branch. Bowman promoted Strange on the spot, briefed him and told him to take over at Ringway, which he did on 1 July.[17] Sqn Ldr Strange and Maj Rock proceeded to cut corners and red tape to get the Central Landing School and its first parachutists off the ground. The first course for instructors started on the 9th July. Strange made his own first jump on the 22nd, at the age of 49.

Air Cdre John Slessor, Director of Plans, was General Bourne's Air Staff contact in the Air Ministry. On 4 July he asked Bourne to postpone the first parachute course. 'More haste, less speed', he counselled:

> 'The development of what amounts to a completely new arm of the Service, requiring a technique which we have never considered, material which we have never thought of providing, and a special personnel whom we have never thought of training, is not a thing that can be done in the twinkling of an eye.'

Bourne replied that the first troops were ready for training, but he did agree to the first course starting after 15 July. It was one of Bourne's last acts as DCO, for on 17 July he was replaced by Admiral of the Fleet Sir Roger Keyes. An ally of Churchill during his wilderness years, Keyes had been badgering the PM for a more active role while he was still First Lord of the Admiralty. Bourne had been appointed by the Chiefs of Staff alone, and they had not sought to bother Churchill while France was collapsing. Churchill now overrode their choice: he had in mind a wider scope for offensive operations, requiring a more senior leader than Gen Bourne.[18] But Churchill took the precaution of asking the overburdened Bourne – who was still commanding the Royal Marines – to stay on as Keyes's deputy.

The Whitley

The choice of the Armstrong Whitworth Whitley for parachute operations and training was a sore point, literally, with the parachutists and agents who had to endure its cramped interior and 'the hole', its funnel-shaped, 3 foot-wide exit to the world beneath through the

Troops dropping from a Tiger-engined Whitley III during a training exercise. Note the tendency for the parachutist to be pivoted forwards as his feet hit the slipstream, creating a perceived risk that his head might encounter the airframe before he is clear.

casing left by removing the Whitley's ventral turret.

But the Whitley was the only aircraft available in sufficient quantities for the parachute operations envisaged by Bourne. Like Germany, Britain had built bomber-transports in the 1930s, but by 1939, while the *Luftwaffe* had several hundred Ju 52s, the RAF had only fifty-odd Bristol Bombays, which could carry 24 armed troops, and 100 of the Whitley's predecessor, the Handley Page Harrow, which could carry twenty. The original order for eighty Bombays had been slashed in favour of the Blenheim, and the Harrows were scattered around the air force in a variety of roles. Whatever the future demand for parachute troops, building transport aircraft was not about to take priority over bombers. Although there was loose talk about building more examples of de Havilland's Flamingo as the Hertfordshire, the RAF had all the transports it was likely to get for some time.

The Army might have accepted the Whitley's discomforts without complaint, but for a brief week in early August they had the opportunity to experience the side-door exit from a Bombay, on loan from No 271 Sqn. The Army was enthusiastic, but almost all Bombays were in the Middle East. No 271 Sqn had a few Harrows, but they were not considered. Ringway also coveted six fugitive

DC-3s[19] belonging to the Dutch airline KLM, but they could not be requisitioned from a foreign-owned company still operating from Batavia (now Jakarta) in the Dutch East Indies. Admiral Keyes enlisted Churchill to intercede with the Dutch government-in-exile to obtain the DC-3s for Ringway, in vain. KLM eventually leased them, and their Dutch crews, to BOAC for use on the Lisbon route. Attempts to acquire DC-3s on the open market in America also failed.

One reason why none of these aircraft was used, even for training, was expressed by Louis Strange. After a fatal accident the Army had refused to drop from the Whitley. In a meeting on 11 August to discuss possible alternatives, Strange stated that 'if operations had to be carried out with Whitleys, the Whitley must continue to be used for training although the Army preferred the Bombay.'[20] A paratrooper accustomed to the Bombay or the DC-3 in training would have found the Whitley experience unnerving at the precise moment when he needed his nerve the most. The Army was told, in effect: 'No Whitley, no paratroops.' Ground training, and initial drops from a balloon, provided a gentler introduction.

In mid-August 1940 Air Cdre Slessor proposed bringing the Central Landing School firmly under Air Ministry control.[21] The Air Staff was not about to let Combined Operations, dominated by the Navy, run its own air training. The Landing School was placed completely under the Directorate of Operational Training (DTO) and No 22 (Army Co-operation) Group, which already provided its administration. Bowman did not want to continue under the new arrangement, and was replaced by Wg Cdr Guy Knocker, another First World War fighter-pilot. Bourne had previously tried to obtain Knocker from Technical Training Command. Bowman's assistant Sqn Ldr Knowles was reclaimed by the Air Ministry, from where he was to act as day-to-day liaison with Combined Operations, but he also remained the link with SIS for the provision of clandestine operations.

On 7 August one of his ex-56 Sqn Flight Commanders, Fg Off John Coghlan DFC, was posted to the 'Parachute Practice Unit, Ringway'.[22] Two Lysanders arrived on 9 and 10 August. On the night of 17 August Coghlan flew a Belgian agent, Henri Leenaerts, to Manston, where he re-fuelled Lysander R2625 before they took off for Momignies, on the Franco-Belgian border. They were never seen alive again.[23]

On the night of 26 August one of Strange's pilots, Flt Lt E B Fielden,[24] with Sqn Ldr Shore acting as despatcher, parachuted Dutch Navy Lt Lodo van Hamel near Leiden from an almost-unarmed Ringway Whitley.[25] Three nights earlier Fielden and Shore, with Louis Strange as 2nd pilot, had flown the first attempt. Van Hamel (known to Ringway as 'Mr X') was the first of many hundreds of Ringway-trained agents parachuted by the RAF into Nazi-occupied Europe. He was captured in October and executed in the following June.

Expansion

In early August 1940 Louis Strange had proposed expanding the Central Landing School.[26] In September the school was upgraded to become the Central Landing Establishment, and Gp Capt L G Harvey took command on 19 September.[27] It now consisted of a Parachute Training Squadron, a Glider Training Squadron, and a Development Unit to cover the development of parachuting techniques, gliders, and the Hafner Rotachute.

It is sometimes necessary to read between the lines of official correspondence. In his mid-August proposal for recapturing Ringway from Combined Operations, Air Cdre Slessor had written:

> 'We are beginning to incline to the view that dropping troops from the air by parachute is a clumsy and obsolescent method and that there are far more important possibilities in gliders. The Germans made excellent use of their parachute troops in the Low Countries by exploiting surprise, and by virtue of the fact that they had practically no opposition. But it seems to us at least possible that this may be the last time that parachute troops are used on a serious scale in major operations.'[28]

The Air Staff's views at the time, summarised in a note to Churchill on 24 August, were as follows: that aircraft could not be reserved for parachute operations, so bombers must be used; the aircraft used for operations had to be used for training; only the Whitley and, possibly later, the Stirling, were suitable; and in any case the Air Staff thought gliders a better bet.[29] To the Air Staff, providing glider-borne troops at the expense of parachute troops would satisfy the requirement for an airborne capability while preserving No 4 Gp's

Whitley force. Each glider could deliver at least the same number of troops as a Whitley, but gliders could be built cheaply and quickly, and their tugs could be smaller than the RAF's precious and expensive bombers.

At a senior Air Ministry conference on 5 September to discuss the future of airborne forces, it was not even clear whether a requirement existed for parachute troops beyond Churchill's demand for them. After listening to the arguments, General Bourne 'did not think the force would be of any value to him for any of the type of operations he contemplated'. The conference agreed that a few parachute troops would be useful in securing a landing ground for glider-borne troops, but both surprise and air superiority were deemed essential. Surprise might be possible, but at that time air superiority over Europe was a distant dream. However, the principle of using parachutists as saboteurs was accepted. The overall size of Airborne Forces, to be ready by spring 1941, was set at 3,560 in total: 500 parachutists (made up of 300 spearhead, 200 saboteurs) and 2,700 glider-troops, with 360 gliders and their Army pilots. The maximum size of any one airborne force was set at 1,000 men. This was far short of Churchill's demand, but there was no point in training thousands of parachute troops if there were too few aircraft to carry them. Building new transport aircraft was ruled out. No 22 Group proposed dropping parachute troops from a glider, to enable the re-use of gliders, but early experiments with Hotspurs were unpromising.

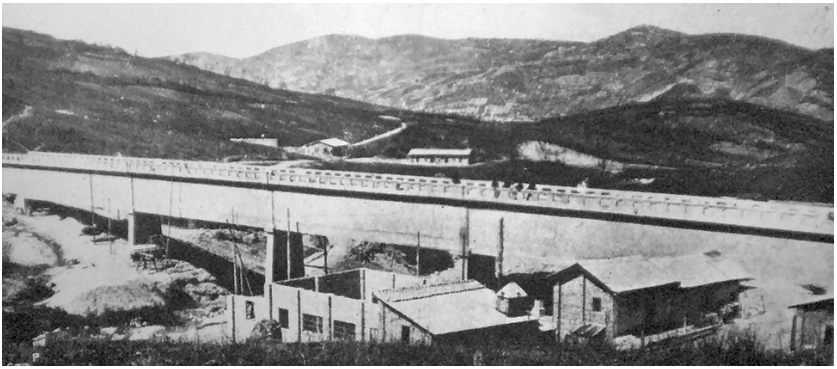
Responsibility for parachute operations remained with Combined Operations by default, yet RAF delegates to the September conference were surprised at the lack of interest in the airborne force. To them 'it was not clear who would take operational control of the force when formed'. In October a revised directive for Admiral Keyes was prepared that would have stripped Combined Operations of responsibility for airborne forces, which would now form 'part of an imperial reserve of troops for offensive operations overseas'. The underlying cause of the directive's revision was that Keyes had liberally interpreted its terms as his personal licence to badger the Chiefs of Staff and sit in on their deliberations, knowing that, as an Admiral of the Fleet he outranked all but the First Sea Lord, his equivalent. Slessor wrote a caustic analysis of the position.[30] Keyes had to be hobbled, but the Chiefs of Staff wavered: a revised directive

Location of the Tragino Aqueduct.

was not issued for another five months, and Keyes hung on for another year. Meanwhile Combined Operations remained responsible for parachute operations, as we shall now see.

Operation COLOSSUS

So to Operation COLOSSUS. I shall concentrate on the air aspects of the operation. In October 1940 Italy attacked Greece through Albania, the later having been annexed the previous year. Italy's main supply lines across the Adriatic ran from the ports of Bari, Brindisi and Taranto , which also supplied the Italian colonies in North Africa. All these ports were in Apulia, a province so dry that the Italians had built a complex aqueduct system to bring fresh water from the head of the River Sele, the main river of the west-draining watershed in the southern Apennine mountains. Without this water the province could not function. When Italy declared war on the Allies in June 1940, Guy Ardley, an engineer with the London firm of George Kent & Sons, devised a plan to blow up one or more of the bridges carrying the aqueduct eastward through the mountains. He wrote to Colin Hardie, a Fellow of Magdalen College Oxford, who passed it to a friend at the Air Ministry. (A classicist, Hardie helpfully indicated that Salerno was 'north of Paestum'; perhaps he saw London as being south of



The Tragino Aqueduct.

Verulamium.) Sabotage so near the source would cut the flow for the whole province. In July Ardley's plan had been without a direct purpose; in October it acquired one, and was dusted off.

Ardley's original letter is on file:[31] his main target recommendation was a bridge across a remote valley, the Bradano (at 40°51'55"N, 15°36'03"E), but early in the planning process this bridge was ruled out because its massive piers would have required a great deal of explosive.[32] A less remote alternative was selected, a concrete bridge across a small stream, the Tragino (at 40°52'37"N, 15°28'19"E), that runs into the River Otranto. Two apparently independent reports had stated that, although the pillars and bridge were reinforced concrete, the piers (ie the bases) were 'muratura' – masonry, and this was assumed to be correct. Concrete piers would require thirty times the demolition charge required for masonry. The fall back plan, should the piers prove to be concrete, was to attack the underside of the aqueduct to damage the enclosed water-conduit directly.

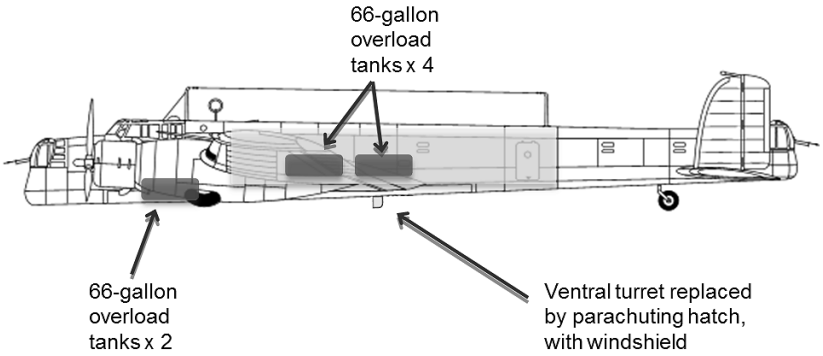
Some writers have assumed that COLOSSUS was conjured-up as some sort of stunt to demonstrate Britain's airborne forces. Far from it: Project 'T' was initially handed to SOE, which took three weeks to report that it 'could not be carried out by irregular forces'.[33] A seaborne attack was ruled out, the target being 40 miles from the sea, and bombing it was not viable either. The project was then passed to Combined Operations, which consulted with the Air Ministry during December. An outline plan was approved by the Chiefs of Staff on 8 January 1941, and the preparatory phase of Operation COLOSSUS

OC 51 Sqn, and leader of the formation, Wg Cdr Willie Tait.

was launched on the 11th.

The operation had to be executed almost exactly a month later. After February the shorter nights would rule out a direct flight across France to Malta, the base for the operation, and moonlight was needed for the attack and the paratroopers' withdrawal across the mountains to the coast, from where they would be picked up by HM Submarine *Triumph*. Ringway had just four weeks to prepare the aircraft and equipment, and to train the aircrews and paratroops.

The original plan had called for a mixed force of Whitleys and Bombays, but Gp Capt Harvey saw the potential for confusion and delay, and he obtained the go-ahead for an all-Whitley force. The original plan had also called for an advance-party to cut the local telephone wires, but this was cancelled.[34] On 15 January eight Whitleys from Nos 51 and 78 Sqns, with crews selected for their navigation skills, flew to Ringway for training. Acting Wg Cdr James Tait DFC, OC 51 Sqn, was chosen to lead the formation, and Wg Cdr Sir Nigel Norman was to take command of the detachment on its arrival in Malta. Ringway's technical staff converted the aircraft for parachuting; racks and containers for the ladders, explosive charges and small-arms had to be designed, fabricated and fitted, all of which was no mean feat in the time available. Meanwhile the bomber crews were trained in the unfamiliar art of dropping parachute troops. The preparations were hindered throughout by poor winter weather. One paratrooper landed in an icy pond, and drowned. A wind-blown dress-rehearsal, with a full-scale mock-up of the target bridge in Tatton Park, went badly; many parachutists had to be rescued from trees by the local fire-brigade. A Sunderland was to fly out to Malta with aircraft spares,

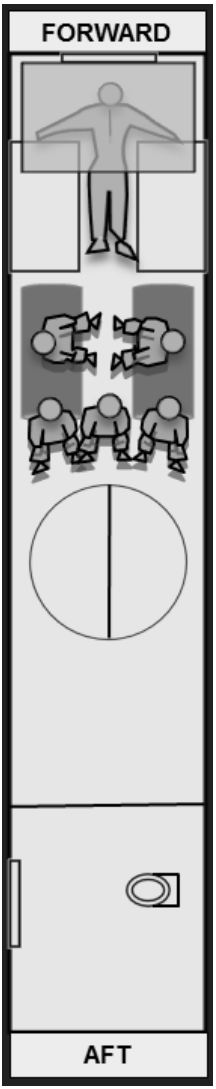


Additional fuel tanks in the Whitley, although the aircraft actually used for the mission would have been Merlin-engined Mk Vs, not Tiger-engined Mk IIIs as shown here, and had only two, of the possible four, fuselage tanks actually fitted.

stores and Lt Deane-Drummond of 'X' Troop, but it was delayed a week by bad weather. It departed England on 3-4 February, and arrived in Malta on the 5th, too late to arrange satisfactory accommodation. The main force took off from Mildenhall on the night of 7 February.

Unlike the Harrow, the Whitley had not been designed to carry passengers, so managing the CofG was essential, and problematic. The Whitley's range could be extended by fitting two 300-litre overload fuel tanks in the bomb bay, plus two more pairs in the fuselage centre-section. For COLOSSUS only the bomb bay tanks and two of the fuselage tanks were used, because the rear pair would have obscured the ventral hatch.[35] For the journey to Malta the paratroopers, a mix of sappers and protective infantry, were spread across the eight Whitleys, five to each aircraft, then for the operation the thirty-six needed to make the attack were crammed into six Whitleys. The other two Whitleys were to bomb Foggia as a diversion. For take-off the paratroopers placed themselves as far forward as possible, but later they could sleep on inflatable mattresses. Several of these were over-inflated, and burst at altitude; foam-rubber mattresses later became the standard.

The first part of the air operation was an unexpected success, for



To squeeze six men into each Whitley on the operational sortie, one had to lie on his back underneath the aircraft's main fuel tank until the aircraft was airborne; two sat on the auxiliary tanks, facing inwards, while the other three sat on the floor leaning against them.

not all the Whitleys had been expected to reach Malta. The containers, charges and ladders were redistributed between the six Whitleys on the 9th, while X Troop's commander, Maj T A G Pritchard, visited the skipper of HMS *Triumph*. Earlier attempts at photo-reconnaissance had been thwarted by poor weather, but on 9 February Fg Off Adrian Warburton flew a successful Maryland sortie over the target. His photos revealed two bridges, so the eastern one was chosen.

Early the following evening, the 10th, the Whitleys took off from Malta. Five rendezvoused at the prominent Monte Vulture, about ten miles north-east of the target. They approached the DZ from the north-west, passing over the lights of the hilltop town of Calitri, on the north side of the Otranto valley. The Whitleys dropped their passengers within a few hundred yards of the target, but only after making a total of twenty runs over the target at 500 feet, while surrounded by higher mountains; this was well outside the crews' bombing experience. The sixth had become lost over Italy; its passengers were dropped an hour late and in another valley to the east; all its containers hung up. Containers hung up on other aircraft, too. Although icing was blamed at the time, there had been many technical issues with the containers and their dropping systems, developed and fitted at Ringway under extreme pressure. A note by the Station Engineer Officer hints at another cause. The bomb-release circuit, adapted for container-dropping, was longer by some 85 feet; unless the accumulator was

kept fully charged the voltage would be insufficient to release the containers. The paratroopers dropped in numbered order, odd numbers facing aft, even numbers facing forward. Even-numbered ones were more likely to 'ring the bell' with their face against the funnel side, as the slipstream grabbed at the legs and pivoted the upper-body forward before it had cleared the hole.

The demolition charges had been calculated with a healthy margin, but the bridge piers proved to be reinforced concrete, not the anticipated masonry. The commander of the sapper party, Cap Daly, had been dropped from the wayward Whitley, but his second-in-command, 2/Lt Paterson, stepped in and improvised with his limited resources. The central pillar was too tall, so the sappers placed their charges at the head of a side-pillar, packed against the bridge's underside, and their explosions produced a satisfying cascade and much flying debris; the sappers believed they had seriously damaged the bridge.

The paratroops then set off in three parties through the mountains for the west coast, but all were captured en route. Fortunato Picchi was a 47-year-old who had been a deputy manager at the Savoy Hotel in London. At five foot tall, and clearly older, he looked out of place. The Italians soon rumbled his origins, his false French identity papers confirming their belief that he was a spy. Picchi was interrogated, tried and found guilty of treason. In October the American Embassy in London learned that Picchi had been executed in the suburbs of Rome, shot in the back at dawn on 6 March.

Even if the saboteurs had reached the sea no submarine would have been waiting for them. One of the diversionary Whitleys had suffered engine-trouble and, entirely unaware of the Navy's arrangements to pick up 'X' Troop, chose to crash-land near the mouth of the Sele as a logical place for the Navy to come and pick them up. A distress message sent in SYKO, a low-grade code, was interpreted in Malta and England as a possible fake; initially HMS *Triumph* was instructed to exercise caution, but the rendezvous was cancelled personally by the First Sea Lord, backed by the Chief of the Air Staff.[36]

Another PRU sortie by Fg Off Warburton DFC on the 12th showed both bridges apparently intact.[37] Still in Malta, Wg Cdr Norman believed the raid had been a complete failure.[38] But in London, reports started to come through from the Italian press of saboteurs captured

As DCO between July 1940 and September 1941, Admiral of the Fleet Sir Roger Keyes was in the chair for Op COLOSSUS.

and of water shortages in Bari and Brindisi. The water supply to Apulia had been impeded, but the damage was swiftly repaired; reservoirs downstream coped with immediate demand, and repair materials for an inverted siphon were readily available[39] – the region is, after all, an earthquake zone. In fact, a pre-raid engineering assessment had concluded that, even after a successful operation, flow might quickly be restored by using a siphon: to 10% by D+14, 20% by D+20, and to 40-50% after a month.[40]

But COLOSSUS had positive side-effects; the Italian population and authorities were thoroughly alarmed, and thousands of troops were diverted to guard installations previously thought safe. In Britain, still being blitzed, still under threat of invasion, the news that we had paratroops, and had used them, raised morale considerably. Churchill queried whether he had in fact authorised the raid, and was informed that he had.

Though the strategic purpose of the operation had failed, the RAF had successfully delivered an airborne sabotage force to a target deep in Italy. The aircrews had performed well, though some had underestimated the difficulty and complexity of the task, and Wg Cdr Tait was awarded the first of his four DSOs. But the raid had revealed significant flaws in organisation: poor target intelligence; inadequate lead-time; a lack of air reconnaissance until the last minute and incohesive command and control. Gp Capt Harvey wrote a thorough review of the entire operation, and Adm Keyes backed his main findings. To both it had been unclear throughout whether Combined Operations or the Air Ministry had been in charge. A 'Lt Colonel G S' of MI9 was rather more blunt: 'The DCO's office insisted far more on doing the operation, than on doing it successfully.' The Air Ministry was adamant that it ran the entire show up to the point when troops hit

the ground. It regarded Combined Operations as a technical advisory body for training, whereas Combined Operations thought it was in command. Had the Chiefs of Staff issued Keyes with their revised directive back in October, the preparations, though perhaps not the outcome, would have been very different. As things were, for those involved, the confusion was exasperating. On 26 January Harvey wrote to Guy Knocker: 'There are at least 10 dozen people running the job as far as I can see.' Harvey's strongest recommendation, which Keyes backed, was for a single operation commander, vested with full powers right from the start. Harvey indicated that such a commander should be an RAF officer; Keyes did not.

For Operation BITING, a year later, the aircrews from No 51 Sqn had, in Wg Cdr Charles Pickard, a leader who had already experienced clandestine parachute operations with 138 Squadron,[41] and Gp Capt Sir Nigel Norman commanded the overall air operation. Yet the will to learn from mistakes was absent, both then and in the future. In an article for the *Air Power Review*,[42] Sebastian Ritchie has shown that Airborne operations throughout the war demonstrated a similar collection of failings in allocating sufficient lead-time, in intelligence, in preparation, and command and control. BITING was successful despite its shortcomings along all these dimensions, and the overall successes of TORCH and OVERLORD masked similar failings in their Airborne components. But failures, however gallantly undertaken, are sometimes inconvenient to recall: the Amphibious Warfare Headquarters, in its 1956 official history of the Combined Operations Organisation,[43] made no mention whatsoever of Operation COLOSSUS.

Notes:

1 Hearn, P; *The Sky People* (Airlife, Shrewsbury, 1990), p 97.

2 Wg Cdr 'Jeff' Jefford's account of the inter-war era of air transport in the Middle East is in Journal No 22.

3 Air Publication 125, A Short History of the Royal Air Force, Second Edition, (Air Historical Branch, Air Ministry, 1936).

4 A fuller exposition of the strategic position is given in the first chapter of David Stafford's *Britain and European Resistance, 1940-1945* (Thistle, 2013, originally published 1982).

5 A rare exception is Horn. Col Bernd and Wyczynski, Michel; *Paras versus the Reich (*Dundurn Press, Toronto, 2003).

6 TNA DEFE 2/791. A copy of Churchill's memo is Encl No 1 in the Combined

Operations 'Provision of Airborne Forces' file.

[7] *Hansard*, proceedings of the 4 June 1940.

[8] TNA PREM 3/330/5, Encls 30-32. Churchill's later memo of the 22nd has been taken as Churchill firing the starting-pistol for Airborne Forces. In fact it acknowledged that something was already being done; the memo's purpose was to suggest that a proportion of paratroops be recruited from non-UK forces.

[9] Lt Gen A G B Bourne, CB DSO MVO, RM.

[10] In 1940 the highest-ranking Royal Marine, an appointment replaced in 1943 by the Commandant-General, Royal Marines.

[11] It has almost universally been assumed that the title was created for Admiral Keyes on his appointment. H L Isaac's letter to Churchill of 20 July 1940, (TNA PREM 3/330/1) refutes this.

[12] TNA PREM 3/330/5, Encls 20-24.

[13] IE (Initial Establishment), ie aircraft notionally in use; IR (Immediate Reserve), ie aircraft on charge as replacements or undergoing maintenance/repair. In practice IR aircraft were often held locally and could sometimes be available for use.

[14] TNA AIR 9/447, Encl 991.

[15] Entry in Ross Shore's logbook, and conversation with his daughter. Strange wrote that Shore had broken a leg. At worst he had sprained it, for he was flying again before the end of July, and accompanied the seven earliest Whitley SD operations in the role of despatcher and parachuting coach.

[16] See *More recollections of an Airman*, an unpublished post-war typescript by Strange, and Strange's and O'Neill's log books: all available to view in the RAF Museum archives, Hendon (O'Neill's logbook on microfilm only).

[17] Anecdote in Strange, *op cit.*

[18] Yet in October 1941 Churchill would replace Keyes with Capt Lord Louis Mountbatten, who was promoted to commodore. Mountbatten was appointed Chief of Combined Operations in 1942, and given the concurrent ranks of Vice Admiral, Air Marshal and Lieutenant General. Lt Gen Bourne retired in 1943.

[19] Actually five DC-3s and one DC-2.

[20] TNA AIR 39/3, Encl 19A.

[21] Directorate of Plans War Diary, TNA AIR 9/447, Encl 991.

[22] Coghlan reverted to his substantive rank on posting.

[23] Coghlan's logbook (TNA AIR 4/17); No 56 Sqn ORB (TNA AIR 27/528); Manston refuelling noted by Eric Clayton in his memoir of No 56 Sqn, *What if the Heaven's Fall* (published privately, 1993); operation details in Belgian records CEGES/SOMA. Coghlan's body was washed up near Wimereux, north of Boulogne, on 23 September 1940; he was buried in Boulogne Eastern Cemetery. No trace of Leenaerts has been found. The other short-range Lysander, R2626, became No 419 Flt's first aircraft, but it was never used on operations.

[24] Not E H 'Mouse' Fielden, then a wing commander and Captain of the King's Flight. In the 1930s Earl Bateman 'Batty' Fielden had been a pilot with Sir Alan Cobham's 'Flying Circus'. He later served with distinction in SE Asia on airborne supply operations, earning the American DFC.

[25] The date for van Hamel's insertion has historically been accepted as 28 August.

The Ringway ORB (TNA AIR 29/512), backed by the logbooks of Gp Capts D R Shore and A J O'Neill DFC, confirm that van Hamel was dropped on the night of 26-27 August.

[26] Referred to in notes of a meeting held at the Air Ministry on 11 August 1940 (TNA AIR 39/3, Encl 19A).

[27] TNA AIR 29/512.

[28] TNA AIR 9/447, Encl 991.

[29] TNA DEFE 2/791, Encl 15 (memo to PM).

[30] TNA AIR 8/1044 memo by Slessor 6 November 1940, and Keene, Tom; *Cloak of Enemies* (The History Press, 2012), Ch 12, 'Firebrand Admiral'.

[31] TNA AIR 2/7450, Encl 1b. Hardie's postcard is Encl 1a.

[32] TNA WO 106/3987, Appx I: one of several copies of a report based on information given by Lt A J Deane-Drummond, Royal Signals, after his escape.

[33] TNA DEFE 2/152, 'General Notes' section, p1.

[34] TNA AIR 8/1066, MI10 proposal for Project 'T' to the Chiefs of Staff, dated 2 January 1941.

[35] On 15-16 February three Polish agents were dropped over Silesia through the rear door of a No 419 Flt Whitley; all four rear fuselage tanks had been fitted in order to reach the target area.

[36] TNA AIR 2/7450, Encl 62A.

[37] Award of DFC published in the *London Gazette*, 11 February 1941.

[38] Wg Cdr Norman's first draft of his report was hand-written in Malta on 13 February, the day after receiving the post-raid photos: TNA AIR 39/13. The spans are clearly intact in the post-raid photos. With the benefit of hindsight, the photos appear to show damage at the western end of the eastern bridge, as described by Deane-Drummond.

[39] McHarg, Ian L; *A Quest for Life; An Autobiography* (Wiley, 1996), pp 41-43.

[40] TNA DEFE 2/153, Encl 36C.

[41] Pickard had flown as Fg Off Ron Hockey's 2nd pilot on No 138 Sqn's first operation, TROMBONE, on 29 August 1941 (TNA AIR20/8334, Encl 69A). The following night he piloted one of three aircraft of No 138 Sqn dropping cigarettes over Holland to celebrate Queen Wilhelmina's birthday.

[42] Ritchie, Dr Sebastian; 'Learning the Hard Way: A Comparative Perspective on Airborne Operations in the Second World War' in *Air Power Review*, Vol 14, No 3.

[43] TNA AIR 20/9503.

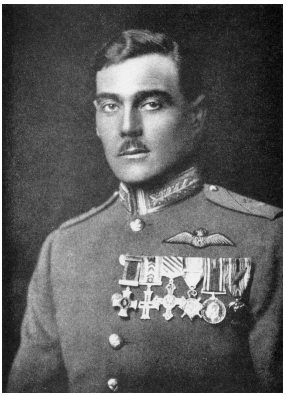
THE PARACHUTE TRAINING OF BRITISH AIRBORNE FORCES

Gp Capt Peter Hearn

Peter Hearn joined the RAF as a National Service-man in 1957. Commissioned and trained as a PJI he soon became prominent in the parachuting world both as a sport and in the exploitation of free-fall within the military. Career highlights included command of No 1 PTS, the award of an AFC and his final appointment as Director of Physical Education. Since leaving the RAF in 1981 he has developed a second career as a teacher and writer.

Louis Strange, the first CO of the Parachute Training School (PTS), had learnt to fly here, on Hendon airfield, in 1913. He joined the Royal Flying Corps in 1914, fought in fighters almost throughout that war, won a DSO an MC and a DFC and an OBE, and retired as a wing commander – although he preferred, and used, its RFC equivalent of colonel. After a career in civil aviation, he rejoined the RAF as a pilot officer in 1940, almost instantly won another DFC (one of only three men to win the DFC in both world wars) before being posted to Ringway as a squadron leader to found and command a Parachute Training School. Parachuting? He knew nothing about it. So he looked for people who did.

At RAF Henlow, he persuaded ten safety equipment workers to volunteer as parachute jumping instructors (PJI). He added a few army physical training instructors and then went in search of some of his old friends. Three were professional jumpers from his time with air circuses: Harry Ward, Bill Hire and Bruce Williams. This mixed bunch produced a syllabus of training, and methods based on



Lt Col L A Strange DSO MC DFC. When the post-war dust had settled, he was awarded a permanent commission as a wing commander but he left the Service in 1921.

The classic X-Type parachute.

one instructor for each section of ten men, to whom he taught the basic techniques of exit, flight and landing – the system that, with some modification, is still in use today. Within a month of Strange's arrival at Ringway, training of Britain's first paratroops began.

It soon stopped, when Driver Evans fell to his death under a failed 'chute. Within a week, the parachute had been changed from canopy-first deployment to rigging line-first. There was no time for extensive trials. It was tried with a few dummies, then Louis Strange and his instructors jumped with it. It seemed to work. And so was born Britain's 'X Type' parachute that was to serve our Airborne Forces throughout the war and for many years beyond, with only the occasional fatality – until 1954 there was no reserve parachute.

And so began the parachute training of Britain's Airborne Forces, taking us to their first operation at Tragino.

You will recall that Churchill had asked for 'a corps of at least 5,000 paratroops'. In April of 1941 he went to Ringway to see how they were getting on. He watched 40 men jump from five ancient Whitleys, and inspected another 400 on parade. He was impressed by the calibre and enthusiasm of the men, but not by their numbers, 'Where are the rest ?' he asked. Louis Strange told him that the Army had not sent the men and the RAF had not provided sufficient aircraft and other training facilities. An angered Churchill told his Chiefs of Staff 'to repair this misfortune'. This resulted in a vast increase in the numbers of troops arriving at Ringway, and the men and facilities needed to train them soon followed. But Strange wasn't there to see it. Senior gentlemen who had their backsides kicked blamed Louis for blowing the whistle on them. They decided that he would be the ideal man to pioneer another venture – flying Hurricanes off the decks of merchant ships at sea! He was despatched to found and then command

With only minor modification, the training methods developed during WW II are still in use today.

the Merchant Ships Fighter Unit. He was later to return to Airborne Forces as Wing Commander Operations at HQ 46 Group, supporting and training the airlift for OVERLORD. He actually flew as despatcher in one of the lead aircraft for the Normandy invasion. May Airborne Forces, and the Royal Air Force, never forget Louis Strange.

Command of the PTS fell to another WW I fighter pilot – Maurice Newnham. Under his guidance, the training of Britain's rapidly expanding parachute force fell entirely to the Royal Air Force, who vested it in its Physical Fitness Branch. This brought a degree of teaching experience to the task. So many of its officers had been school teachers that a visiting general, having asked several officers at Ringway what they had done before joining the war, was heard to mutter 'the place is full of bloody schoolmasters.'

These bloody schoolmasters and their NCO counterparts soon honed the basic training methods pioneered by Louis Strange and his staff. Under the guidance of the chief instructor, John Kilkenny, synthetic equipment and basic training techniques were improved, and a new syllabus written, still based on those three elements of exit, flight and landing. This system of training for basic parachuting has lasted to this day – with a few modern additions as OC ADW will later tell you.

Apart from the welcome introduction of the Dakota, with its side-door exit, little changed at what was now called No 1 PTS. No 2 PTS was formed in India and No 3 in the Middle East. By the end of the war, Britain had two Divisions of Airborne Forces, whose deeds you will be hearing about later. 60,000 British and Allied troops had been trained at Ringway, and that great Airborne commander, General Richard Gale, was able to say 'the spirit that has enabled so many of them to perform such grand and courageous tasks was largely laid at the Parachute Training School.'

There was an inevitable reduction of our Airborne Forces after the war, to one brigade of regular troops (16 Para Bde) and a brigade of territorials (44 Bde). A correspondingly reduced PTS moved to Upper Heyford, and in 1950 to Abingdon. For the continuation training and operational support of the two brigades, PJIs were based at Aldershot, and at territorial centres throughout the country. There was little change in training methods. There were improvements to equipment carriage, and the introduction of the Hastings in 1950 brought us

The Dakota, with its side door, was a welcome advance on the hole-in-floor exit offered by the Whitley.

double door jumping – and its attendant problems. A new cry was heard in the training hangar: 'All round observation …..... STEER AWAY!' as troops in the flight-trainers were taught to avoid each other in a suddenly overcrowded air space. The introduction of a reserve parachute in 1954 – welcomed by new recruits but thought to be 'a bloody nuisance' by the older and bolder – brought only small complications to flight drills.

While talking about parachutes, let us remember that since training began at Ringway, the packing and maintenance of parachutes had been the task of RAF safety equipment workers, many of them WAAF girls. 'For thirty years I have put my life in the hands of the good Lord,' said an airborne padre before he made his first jump. 'I hope he will forgive me if, for a short while, I put it in the hands of a WAAF parachute packer . . .'

The introduction of the Beverley, followed by the Argosy and then the first of a long line of Hercules required only minor alterations to the teaching of aircraft drills and exit techniques. And the balloon continued to support basic and continuation training. Introduced at

Like the Hastings, the Beverley offered double-door jumping.

Ringway and its Tatton Park drop zone in 1941, the captive balloon with its 'cage' slung beneath it was to provide, for many years, a safe and relatively simple means of sending paratroops on their first two jumps. After the war, it also provided both parachute brigades with a convenient means of continuation training, with a permanent balloon at Aldershot for 16 Para, mostly operating at Hankley Common. We also had a fleet of seven mobile balloons which travelled the country to serve the territorial battalions. As a young PJI officer at Abingdon I would travel to Town Moor in the centre of Newcastle, to York racecourse, to Wanstead Flats in north London – all over the country – acting as DZ Safety Officer for these TA Weekends. I remember sharing a hip-flask of malt whiskey with that great airborne warrior General Alistair Pearson on a stretch of moorland just outside Glasgow, as we watched the jocks of 15 Battalion drifting down out of the sky . . .

Sadly we no longer have the balloon. It was pensioned off in the 1980s, and its place for basic training at PTS was taken by slow-flying and exit-friendly Skyvans, flown by contracted civilian companies. The balloons were no longer needed for those 'TA Weekends' either,

The balloon was a mainstay of parachute training until 1980.

because 44 Brigade was being run down. We missed the balloon. We missed the cry of the winch operator 'Up 800 feet, Five men jumpinggggggg . . .'

In the 1960s, the long-overdue replacement of the X-type parachute by the larger, more stable and more reliable, PX required only minor modification to parachuting technique and instruction but it surely gave us a smoother ride.

In the 1950s and '60s, PTS became a popular training venue for foreign Airborne Forces. Having its own elite force of paratroopers became quite the vogue for emerging nations, even if they only served as the Presidential Guard. Iraq took it more seriously than most, and we produced quite an army of Iraqi airborne soldiers. Likewise Sudan, Ghana, Rhodesia and other African friends. Some of our PJIs could swear in several languages.

Also throughout the 1950s and into the '60s, for our own people, parachute training and the output of trainees continued to reflect the changing role of Airborne Forces. Their strategic potential was lessened by the reduction of Britain's overseas commitment. Their tactical parachuting role was reduced by the increasing potential of the helicopter – as demonstrated by the Americans in Vietnam. Indeed, the increasing efficiency of radar and ground-to-air weaponry, even among the less well-developed nations, threatened the very concept of low level aerial delivery. The last mass assault against an enemy by Britain's Airborne Forces was to be at Suez in 1956.

It was largely in response to this problem that the military mind turned to the concept of military free fall as a means of delivering troops from altitudes beyond the range of devices that were unfair to low flying aeroplanes. Not a lot was known about free fall parachuting in 1959 and I was lucky enough to be one of a few selected PJIs to be sent to France to find out more. The French were, at the time, the

From the 1960s onwards the focus of parachuting has been increasingly on free fall.

masters of free fall. We were taught the techniques of sport parachuting, for no one on this side of the 'iron curtain' had yet developed free fall for military parachuting. At PTS we applied these sporting techniques to more serious business. We learned and then taught others how to free fall at night, with weapons and equipment, opening their 'chutes to land in places where they were not meant to be. This was High Altitude Low Opening – HALO. By 1961 we were teaching these procedures to the SAS, followed by selected members of the Parachute Regiment and the Royal Marines. Oxygen equipment was added to give us more altitude; equipment carriage was improved; higher performance parachutes were introduced and major advances were made in training techniques. The parameters of HALO were extended to embrace HAHO – High Altitude High Opening, greatly widening the scope for clandestine entry by parachute. OC ADW will later bring us up to date in this fascinating area.

As parachuting went higher, it was also seeking to go lower. As radar and air defence systems became increasingly unfair to traditional airborne assault, there was a move to creep *under* any surveillance. This might be achieved by aircraft flying in just above ground level, then 'popping up' to drop height at the last moment. Better still if they didn't have to 'pop up' at all. Ultra low level dropping was applied to the delivery of supplies, including heavy equipment, and endeavours

were made – to the dismay of most parachutists – to use similar techniques for the dropping of personnel. The Russians had tried dropping troops in iron ‘sledges’ in the 1930s. Not very popular, nor successful. The height at which a personnel parachute is dropped is determined by the speed at which it opens, and the time needed for the jumper to deploy his reserve parachute if needed, and to prepare for landing. Trials on various ideas for a low level parachute were carried out, but it was concluded that little advance could be made on the capability of the ‘chute as it was, and that if operational circumstances justified the risk, the reserve could be dispensed with and drops made as low as 400 feet. This risk has been reduced even further by the replacement of the PX parachute by today’s main static line canopy.

Higher, and lower. These differences in delivery technique were largely mirrored in the growing distinction between Special Forces and the ‘basic’ paratrooper. From the 1980s onwards this distinction, and the emphasis put on the two of them, has shifted towards Special Forces. When 44 (Territorial) Brigade closed down in the early ‘80s, it left a small number of Special Forces as our only TA representation within Airborne Forces. By 1990, more training resources, at both basic and continuation levels, were being applied to Special Forces than to ‘basic’ airborne units. Again, OC ADW will update us.

The parachute was little used in the Falklands War. Strategically it was used out of our base at Ascension Island to deliver Special Force reinforcements and a few key individuals to the operational area by dropping them into the sea close to ships of our fleet. The helicopter was far more suited for tactical movement within the combat zone.

Free fall parachuting was also used in Iraq, but on a very small scale. The helicopter, the Land Rover, and ‘Shanks’s pony’ were favoured for unauthorised entry.

The capability of Special Forces in particular has been increased by the introduction of a steerable static line parachute. This allows small groups to land in restricted areas and, more importantly, it allows them to land close to their equipment. This we see in the delivery of special boat crews into the sea *with* their boat. I first submitted a case for a steerable static line ‘chute when I commanded the RAF Detachment to Special Forces way back in the 1960s. We were then evolving a technique for dropping men to far-away submarines – easier than having submarines come for the men – and a steerable ‘chute would

have been nice. But these things take time . . .

The actual development and the necessary testing of new concepts and new equipment is the task of various trials units. Such units have been co-located with PTS, but the test facility at Boscombe Down has long provided Airborne Forces with its major means of finding out 'Does it work?' and, if so, 'How are we going to use it?' New aeroplanes, new parachutes, new equipment containers, new 'anything-to-do-with-parachuting' are all dealt with by Boscombe Down or its associated units where they pass through the hands of some of our most highly qualified PJIs. They are the test-jumpers of the military parachuting world.

The introduction of young ladies into the world of the PJI in the 1980s, has in no way changed the manner, nor the quality, of our training. They do exactly the same as their male colleagues, to the same high standard. They have featured in the RAF Parachute Display Team – the Falcons. 'Ah, but what's that got to do with Airborne Forces?' you might ask. Quite a lot. Our 'Falcon', in addition to learning how to parachute into Wembley Stadium or wherever, is also being taught during his or her time with the team to become an advanced practitioner and instructor of military free fall. So it has always been during more than fifty years of RAF 'Falconry'. Our young lady, when she finishes her time as a 'Falcon', will be capable of teaching Special Forces to the highest levels, and if necessary despatching them into the skies above Afghanistan or wherever else they might be needed.

So I draw to my conclusion. Wing Commander Loxton at the end of the day will bring you right up to date on the training of the airborne soldier. As you will see, modern methods of visual and sensory simulation have now been added to the traditional use of landing ramps, flight harnesses and mock fuselages. But let us not forget our pioneers. Gravity is still as unforgiving as ever; the ground is still as hard as ever; bones are still as brittle; the wind is still as cussed. So, alongside our modern training techniques, you will still hear, echoing through the training hangar, the cry of the Ringway PJI 'Elbows in!' . . . 'Chin on chest!' . . . 'Feet and knees TOGETHERRRRRRR!' No. *Never* forget him.

GLIDERS, TUGS AND EARLY OPERATIONS

Wg Cdr Colin Cummings

Colin Cummings served in the Supply Branch for 31 years. After a series of station tours, mostly in the Far East, he spent a significant element of his service involved with IT systems, both within the Supply Branch and in the Directorate of Flight Safety, and eventually became the first officer of the Supply Branch to manage an aircraft Support Authority (the Jaguar). Author of a notable series of books on aircraft accidents, and one on Arnhem, he still holds an RAFVR(T) commission and is a member of the RAFHS committee.

This presentation will cover four main topics.

- First, it will consider some aspects of the training regime which took volunteer soldiers and turned them into glider pilots
- Secondly, it will describe, albeit briefly, the development of the gliders needed to train and then deploy airborne troops.
- Since the RAF's choice of the somewhat inadequate Whitley to tow gliders, drop parachutists and then sustain the deployed troops until they could relieved by conventional forces was discussed in Journal No 42, this paper will consider only the other aircraft used in the airborne forces role.
- Finally, it will cover two small scale airborne operations which followed COLOSSUS prior to the deployment of an airborne brigade to North Africa in late 1942.

Training

In commenting on the training of glider pilots it should be born in mind that, in the beginning, no one really knew how to deliver what was required – or even what the requirement actually was. As a result, the early days were a trifle chaotic, although the system soon settled down once the necessary techniques had been devised and a training sequence established, supported by an agreed syllabus.

The origins of glider training lay in the formation of the Glider Training Flight at Ringway in August 1940 with a single Scott Viking sailplane and access to a pair of Avro 504Ns, all impressed civilian

aircraft, and a car. Having been expanded to become the Glider Training Squadron and become a component of the newly established Central Landing Establishment in September, it was becoming apparent that glider flying and parachute training were incompatible. At the end of December, therefore, the Glider Training Squadron, by this time equipped primarily with Tiger Moths and Kirby Cadets, moved to Thame (known as Haddenham until October 1940).

The wheel-less motor cars scattered about the airfield as anti-invasion obstacles were quickly cleared and several more impressed civil sailplanes acquired. Training commenced with Sgt Malcolm Strathdee being the first to solo and Cpl Weston achieving the dubious privilege of having the first accident when he put a glider through the roof of a building.

The first serious military gliders, Hotspurs, and more capable tugs, Hectors and Audaxes (later superseded by Master IIs and Lysanders), began to be delivered in the spring of 1941 permitting more realistic training to begin. In the summer a Glider Exercise Unit was set up at Ringway and in December Thame's Glider Training Squadron was split in two to create Nos 1 and 2 (of an eventual five) Glider Training Schools (GTS), the latter promptly moving to Weston-on-the Green. By mid-1942 the standard training sequence for a prospective glider pilot involved a powered flying course at an Elementary Flying Training School, eg No 3 at Hamble, No 16 at Derby or No 21 at Booker, followed by a three-month course on the Hotspur at a GTS and the presentation of the Army flying badge after another six weeks on the Horsa with the Heavy Glider Conversion Unit at Brize Norton. Conversion to the Hamilcar, which began to enter service in 1944, required another course at Tarrant Rushton.

From the outset, many of the instructors were RAF personnel and strong bonds developed between the RAF and Army. These bonds were reinforced following Operation HUSKY in 1943 when the squadrons of the Glider Pilot Regiment were collocated with the tug squadrons with whom they would train and operate. Following the losses sustained at Arnhem the two Services became inextricably linked when it became necessary to second 1,200 RAF pilots to fly with the Glider Pilot Regiment, close to half of whom would participate part in the Rhine crossing – Operation VARSITY.

Before moving on to discuss the development of assault gliders, it

is perhaps worth quoting Benjamin Franklin who wrote, after witnessing a hot air balloon flight in Paris in 1784:

> ‘Five thousand balloons, capable of raising two men each could not cost more than five ships of the line. Where is the Prince who can afford so to cover his country with troops for its defence, that ten thousand men descending from the clouds might not in many places do an infinite deal of mischief before a force could be brought together to repel them.’

How prescient was that?!

The Gliders

The first glider intended for use by airborne forces was the General Aircraft Hotspur. Built to a requirement issued in June 1940, the prototype was ready for flight testing barely six months later. Air Ministry Specification X.10/40 had called for a glider capable of flying for 100 miles in still air, having been released at 20,000 feet, the idea being to ensure surprise by keeping the tug well away from the landing site. In the event, while the Hotspur proved to be capable of covering only 83 miles, its 62-feet, high aspect ratio wing gave it handling characteristics akin to those of a sailplane. Oddly enough, the specification makes no mention of the oxygen that would surely have been required, both for the pilot and for the seven soldiers sitting behind him, nor is there any indication of the type of aircraft that was going to tow a Hotspur at 20,000 feet.

An unusual feature of the Hotspur I was that, on landing, the whole cabin roof would have been jettisoned permitting unimpeded and thus speedy disembarkation for the seven soldiers on board. Before the handful of Mk I Hotspurs had even begun to enter service, however, the Air Ministry had changed the tactical concept. Instead of the original long stealthy glide, the new idea was to arrive overhead and then dive steeply onto the landing zone (LZ). This was achieved by reducing the wingspan by sixteen feet and making some changes to the flaps and ailerons but by this time it had also been decided that something bigger would be needed for operational use and the Hotspur was now seen primarily as a training, rather than an assault, glider (and it never was used operationally). A new specification, X.22/40, required a ‘readily removable dual conversion set’. Most of

Above, Hotspur Is were distinguished by a small cockpit canopy, the large portholes in the detachable cabin roof and the original high aspect ratio wing. Below, a pair of Hotspur IIs with a much larger canopy and eight feet lopped off each wing.

the 1,000 Hotspur IIs built were provided with this facility but fifty were subsequently modified to Hotspur III standard, which involved fully duplicated dual controls and instruments, and an externally braced tailplane.

The second glider, which took only a year to develop, was the Horsa. Built by Airspeed to specification X.26/40, it carried a crew of two and, in addition to carrying out an assault landing, was intended to be capable of delivering twenty-four troops by parachute. This would have permitted a single Horsa to drop a platoon of soldiers, which would otherwise have required three Whitleys. Indeed the original idea had envisaged Horsas being towed in trains of three, permitting delivery of a whole company of parachutists.

As with the Hotspur, the reality was somewhat different and the Horsa was actually used conventionally – for a glider. That is to say that it would carry a platoon of soldiers from an air landing battalion

Above, A Horsa I with its large loading door/platform and detachable rear fuselage and, below, a Horsa II with its detachable cockpit. Either way, the glider could accommodate up to 25 troops or a worthwhile load of freight, in this case a Jeep and a 20mm AA Gun.

or a range of support equipment, including Jeeps, a 6-pounder anti-tank gun or a variety of engineer stores. Its capacity also influenced the organisation of an air landed battalion, most of which would have four rifle companies, each comprising four platoons; these alone requiring a total of sixteen Horsas. When double the normal scale of mortars, anti-tank weapons and machine guns were added, the total establishment came to 849 men, compared to the 530 of a parachute battalion, more than doubling the number of gliders.

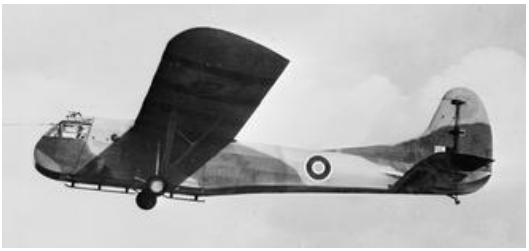
The Horsa was a surprisingly large aeroplane, much the same size as a Wellington, although only half the weight. Although there was a freight door, incorporating a loading platform and a range of loading ramps had been developed, getting large items of equipment aboard could be a lengthy procedure. Unloading on the LZ, probably under fire and without any form of mechanical assistance, required easy

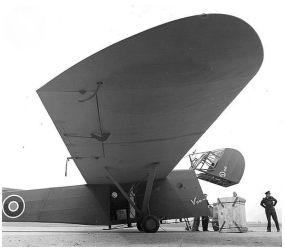
The capacious fuselage of the Hamilcar, with its swing-nose loading facility could accommodate quite substantial vehicles, in this case a Bren gun carrier, one of two.

access. On the Mk I this was achieved by making the whole rear fuselage detachable either by undoing eight quick release nuts and bolts or by use of the 'surcingle' – a band of detonating cord. The latter worked well enough, but it is suspected that premature activation of this facility caused the loss of the first glider to fall while en route to Arnhem. Known as the 'Double Hills Incident', the loss of this glider, and all twenty-three men on board, is commemorated at an annual ceremony held near Keevil every September. The Horsa II had a hinged nose permitting straight-in access to the full width of the fuselage.

The Horsa was the most numerous of the assault gliders and it could, and was, towed by everything from an Albemarle to a Halifax, but it could not carry a 17-pounder anti-tank gun, which had a significantly longer barrel than the 6-pounder. This dictated that something even larger would be required, perhaps something even capable of delivering a light tank. This, the General Aircraft Hamilcar, to Specification X.27/40 which was issued in April 1941, was yet another glider that enjoyed a remarkably short gestation. After preliminary discussions, it was decided to build a half-scale model. Unfortunately, this crashed on its first flight, but this was due to a handling error rather than a flaw in the design and the full-scale prototype flew in March 1942, still less than a year after the issue of the Specification.

At 37,000 lb a loaded Hamilcar weighed the same as an empty





The American Hadrian was smaller and less robust than its British equivalents.

Lancaster, but its 110 ft wingspan was eight feet longer than the bomber's, giving it a much lower wing-loading. Total production ran to a little over 400 aircraft, compared to well over 3,500 Horsas, but for such a large aircraft it was remarkably successful and, besides the 17-pounder, a Hamilcar could deliver a pair of armoured scout cars or Bren gun carriers, a Tetrarch or Locust tank or a range of relatively heavy and/or bulky pieces of engineer field equipment. Its size and weight demanded a particularly powerful tug and the Hamilcar was always towed by a Halifax.

The fourth glider available to the Allies was the American Waco CG-4, known to the British as the Hadrian. The standard US Army glider, it was of fabric-covered mixed wood and tubular steel construction, in contrast to British gliders which were all wood. Although, at 83 feet, its wingspan was only slightly less than that of the Horsa, the Hadrian had only half its capacity, fifteen men or rather less than 2 tons of freight. That said, the entire nose section hinged upwards to give unrestricted access to the fuselage which was wide enough to take a Jeep or a 75mm M1A1 pack howitzer. First used by the British during Operation HUSKY, the Hadrian was found to have some serious deficiencies. Most of these arose from its lighter construction, which made the airframe less robust than its British equivalents. As a result it was prone to distortion when landing on an unprepared LZ, which, in turn, could lead to injury or difficulty in unloading.

The RAF was responsible for procuring the gliders which the Army used, this responsibility embracing storage and preparation for operations. This involved holding considerable stocks at remote locations to avoid overcrowding at the operating bases during routine

training activities. Some of these training exercises could be quite productive as fighter squadrons being redeployed around the country for rest periods were sometimes moved by gliders. Before an operation the required number of gliders would be collected from the storage units and flown to the launch bases. The most extreme example of this was the ferrying of Horsas to North Africa prior to the invasion of Sicily in 1943 (an undertaking that was described in Journal 46).

Once on-site, the gliders, perhaps forty or fifty of them, would be ranged in pairs along the runway with their tugs lined up in echelon on the grass alongside with the tow ropes laid out in predetermined patterns. One by one, the tugs taxied onto the runway, took up the slack on its tow rope and took off to be followed by the next combination in quick succession. All of this had to be choreographed with some precision and, so long as everyone followed the well-rehearsed drills, a launch ought to have been trouble free. They rarely were, of course, and there were almost inevitably incidents involving unserviceable tugs, broken tow ropes and the like. There were laid down procedures to cope with all manner of contingencies in order to ensure that one failure did not disrupt an entire operation. In short, the launch of a major glider borne assault was a pretty sophisticated operation in itself.

The Tugs

Moving on to consider the aircraft used as tugs, it will become apparent that, while the development of capable heavy gliders may be regarded as having been successful, the acquisition of suitable aircraft for towing them, and for deploying parachute troops, was much less so. We have already heard something of the Whitley and its limitations from Nick Livingstone, so we can consider other early options. It is sometimes suggested that more might have been done to establish the suitability or otherwise of two of the aircraft designed and built to a pre-war specification calling for bomber transports, the Bristol Bombay and the Handley Page Harrow.

In the case of the Bombay, only fifty were built and the bulk of the production run was allocated to the Middle East. A few were retained in the UK for use by No 271 Sqn, but only briefly, and following the fall of France – and just as the airborne concept was being hatched –

Hampered, as a bomber, by constraints imposed by its specification, the Albemarle eventually found its niche as a glider tug.

most of these were sent to Egypt to join the others. As to the Harrow, the last of the 100 built had been delivered in December 1937 and within three years almost half of them had already been written off, so they were a rapidly diminishing resource. By the end of 1940 most of those that remained were being usefully employed as gunnery trainers, although a handful, minus their turrets, soldiered on as transports, notably in the casualty evacuation role, until the end of the war. Apart from both types being of dated design, if any thought ever was given to reinstating their production, this would surely have been ruled out on the grounds that it could only have been done at the expense of Blenheims, Beauforts, Hampdens and the imminent Beaufighters and Halifaxes, all of which would have had a much higher priority. In effect, the already obsolete Bombay and Harrow were non-starters.

The Albemarle had been designed as a reconnaissance bomber, with heavy emphasis on the former, but the specification (B.18/38) had required that construction should be handled by firms outside the aircraft industry. Co-ordinating the efforts of about 1,000 sub-contractors contributing a variety of components created management problems that delayed production and made the aircraft inordinately expensive, allegedly costing 20% more than a Lancaster. By the time that Albemarles actually began to become available in 1942 it was already obsolescent and, after considering several possibilities, it was finally decided to use them as glider tugs. As such they earned their keep by participating in HUSKY, OVERLORD and MARKET GARDEN towing Horsas and, less frequently, Hadrians and, on occasion even dropping paratroops, as it did on D-Day.

The four-engined Stirling was another aeroplane in search of a role. The least capable of the RAF's three heavy bombers, before the

After an initial ‚career as the first of the four-engined heavy bombers, the Stirling flew on as a transport and glider tug until the end of the war. These are Mk IVs of No 196 Sqn at Keevil on 5 June 1944.

end of 1943 it had been decided to withdraw the type from Bomber Command and Stirlings flew their last bombing sorties against targets in Germany in November of that year. While the Stirling may have had some limitations as a bomber it was still a powerful and useful aeroplane and it continued to operate for the rest of the war in substantial numbers. Six squadrons within No 38 Group of Transport Command were equipped with Stirlings and from early 1944 they trained with the Horsa squadrons of the Army while also carrying out supply dropping missions to resistance groups on the Continent.

Adapting the Stirling for glider towing and parachute dropping involved removing the nose and dorsal turrets, fitting a glider towing bridle and making a large hole in the rear fuselage through which up to twenty-two parachutists could jump. Jumping through holes in the floor was not the ideal way of leaving an aeroplane and, as with ‘the Whitley kiss’, this could lead to ‘ringing the bell’ – failure to make a clean exit could cause the parachutist to be pitched forward by the slipstream before he was clear of the airframe, resulting in a broken nose or the loss of some teeth.

A Merlin-engined Halifax/Horsa combination.

The last, and most capable, of the RAF's home-grown transports was yet another bomber being used in a secondary role. The Halifax, initially Merlin-engined Mk Vs but progressively supplanted by Hercules-powered Mk IIIs in time for the Rhine-crossing, was not used for delivering paratroops but its capacious bomb bay could accommodate two Jeeps or a Jeep and a 6-pounder cannon; supply containers could also be carried in the wing bomb cells and the entire load could be dropped by parachute. Furthermore, it was the only type able to tow a Hadrian, a Horsa or a Hamilcar, the latter leading to particularly close co-operation between Nos 298 and 644 Sqns at Tarrant Rushton with 'C' Squadron of the Glider Pilot Regiment which specialised in delivering the heavier equipment and larger anti-tank guns to the battlefield. Later versions of the Halifax, notably the Mk IX, continued to serve with the post-war RAF until they began to be displaced by the Hastings in the late 1940s.

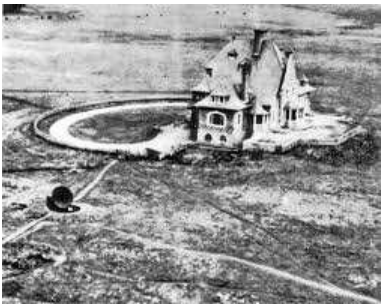
Finally, there was the Dakota. The RAF had wanted Dakotas from the outset but, apart from a handful of refugee examples belonging to European airlines, there were none available at the time. A pair of Sabena's DC-3s served briefly with No 24 Sqn, but both had been lost before the end of 1940, and five DC-3s and a DC-2 belonging to KLM were registered to BOAC and committed to maintaining a service between Bristol and Lisbon flown by Dutch crews. In addition, twenty-five second-hand DC-2 and DC-3 airliners were acquired in 1941-42 and pressed into service as military transports in the Middle East and India, but it was the spring of 1943 before substantial

From 1943 onwards Dakotas formed a large part of the RAF's transport force and in north west Europe they took part in all three major airborne operations, towing gliders and dropping supplies. These are picking up casualties from Normandy in June 1944.

quantities of the militarised C-47 began to be supplied under Lend-Lease.

The RAF would eventually receive more than 1,900 of these war-winning aircraft and they soon became the standard RAF freight and troop transport in all theatres, from deploying and supporting the second Chindit campaign in Burma, to landing at sites in occupied Poland. Its availability in Europe led to the creation of the exclusively Dakota-equipped No 46 Group. Operating mainly from Broadwell, Down Ampney and Blakehill Farm, its squadrons delivered paratroops and towed gliders in all three major airborne operations conducted in 1944-45. An RCAF unit, No 437 Sqn, had been added just in time for Arnhem and the Canadians formed two more Dakota squadrons in India.

The RAF was still able to commit nine squadrons of Dakotas to the Berlin Airlift but soon afterwards they began to be replaced by the Valetta. Nevertheless, a handful were retained, for sky shouting during the Malayan Emergency for instance, and the last of these remarkable aircraft was not withdrawn from service until 1970.



The well-known photograph of the Bruneval site with the dish of the Würzburg *radar in the foreground.*

Two Small-Scale But Significant Operations

In conclusion, it is instructive to consider two specific raids that serve to illustrate the fine balance between success and failure that characterise airborne operations, even those conducted on a small scale by specially trained personnel. The first, Operation BITING, is better known as the Bruneval Raid. Professor R V Jones' analysis of enemy air activity had indicated that the Germans might be operating radar from sites in occupied France. Intelligence sources tended to confirm this and reconnaissance aircraft had brought back photographs of a number of unidentified installations.

It was decided to investigate the site at Bruneval. A seaborne commando raid was considered but ruled out in favour of a parachute landing with the party to be recovered by sea. Preferring not to commit 1 Para, the only fully-trained airborne unit available in case a priority task arose, Maj Gen Browning directed that the operation would be carried out by, the recently formed, 'C' Company, 2 Para, commanded by Major John Frost – at the time many of Frost's men had yet to complete the parachute training course.

The 119-man team was to be delivered in sticks of ten by a dozen Whitley Vs of No 51 Sqn led by Wg Cdr Charles Pickard. An initial rehearsal of the whole exercise was a failure but it was repeated successfully two days later. The crews stood by at Thruxton from 23 February 1942 and after four cancellations due to weather the operation was mounted on the 27th. Shortly before coasting-in the aircraft were engaged by *Flak* ships and they were fired on again before reaching the drop zone (DZ).

Over a period of 19 minutes from 0020 hrs the parachutists, including Sgt Charles Cox, an RAF radar mechanic, were dropped with the aircraft flying at 90 mph. Having flown into mist, one crew had difficulty finding the DZ and had to search for its IP prior to running in. Another had to make two runs over the DZ as one of its

soldiers became entangled in the static lines of those who had jumped before and had to be pulled back into the aircraft.

Cox and a small party of Royal Engineers, led by Capt Dennis Vernon, dismantled as much as they could of the *Würzburg* radar and carried it away in a specially designed cart. After some confusion on the beach, the whole party, including two prisoners, was successfully recovered. All the aircraft also returned safely, although some had sustained some damage.

There was a long term spin-off from this raid. Increased security was provided at all of the other German radar sites, including fencing them in with barbed wire entanglements. Since the grass within the wire could not be mowed, or even grazed, the sites could be clearly identified, making them relatively easy to deal with in the run up to D-Day.

Despite the potential risk involved in selecting only part-trained troops, this had not proved to be a handicap and BITING had been a considerable success. This would not be the case with Operation FRESHMAN, an attack on the heavy water plant at Rjukan.

The allies were aware that the Nazis were attempting to develop an atomic bomb and the physics involved in the process required the production of heavy water. This was being undertaken in occupied Norway at a hydroelectric complex near Vermork. It was decided that an attempt should be made to destroy this plant using a demolition team which was to be delivered by gliders landing on an LZ that would be marked by Norwegian agents. Having carried out their mission, the team was expected to seek sanctuary in neutral Sweden – which would involve crossing more than 200 miles of mountainous terrain in winter. Preparations for the operation were controlled by HQ 38 Wg and the attacking force was to be launched from Skitten in northern Scotland, even so, it would still be a 400 mile transit.

Of the two gliders, Horsas, one would be flown by a pair of RAAF pilots, Plt Off N A Davies and Sgt H J Fraser, the other by Staff Sgt M F C Strathdee and Sgt P Doig of the Glider Pilot Regiment. Three Halifax tugs were allotted specifically for the operation and were stationed at Netheravon with some engineering support being provided by personnel of No 138 Sqn from Tempsford. Practice long-distance tows were made, mostly using Whitleys from Thruxton, but sufficient flying was done with the Halifaxes to familiarise the tug

A pre-war photograph of the hydro-electric plant at Vermork, the objective of Operation FRESHMAN.

pilots with an aircraft that they had not previously flown.

Having begun the move to Skitten on 13 November 1942, an exercise that was complicated by a series of unserviceabilities with the Halifaxes, an attempt was made to mount leaflet dropping sorties to the Oslo area on the 18th to permit the crews to see the terrain. Only one was successful, however; the second aircraft being obliged to return early with engine trouble.

The mission was launched on the night of 19th/20th. Both combinations took off with the intercom links between the tugs and gliders already inoperable. Other than using the radio in a dire emergency, that left light signals as the only method of communication but, that aside, both aircraft were flown to Norway without undue drama, although the hastily installed Rebecca equipment in the aircraft captained by Sqn Ldr A B Wilkinson, failed. Its loss would prove to be critical as it prevented the crew from homing onto the portable Eureka beacon that was being operated by the Norwegians at the LZ. Having failed to locate the LZ on its first run (although the Norwegians subsequently reported that they had heard the aircraft fly

almost directly overhead) the crew made a second attempt.

Five hours after take off, and having spent well over an hour attempting to locate the LZ, and considering that the pilots of the tug and glider had been unable to speak to each other, the fact that Strathdee and Doig had coped with all the changes of direction is testimony to their considerable skill and perseverance. By this time, however, the tug's fuel state was becoming critical and it was decided that the mission would have to be abandoned. Wilkinson set course for Peterhead but, having climbed laboriously to 12,000 ft the aircraft flew into cloud and began to pick up ice. No longer able to maintain altitude there was no option but to descend, through cloud, to below the freezing level. Flying in thick cloud at 7,000 ft conditions were very bumpy and the tow rope eventually parted – or the glider cast off. The Halifax crew could do no more than return to base while the Horsa crash landed in the mountains. Of the seventeen men on board, eight died instantly and four were injured; only five were unhurt. The survivors were all rounded up and killed by the *Gestapo*; the wounded were murdered in cold blood – by a doctor!

The second combination, its Halifax captained by Flt Lt A R Parkinson, RCAF fared even worse. Having coasted in at Egersund, the Horsa crash landed (so it had presumably been flying free, but whether intentionally or inadvertently is not known) in mountains about five miles inland. The Halifax crashed a few miles further on, the entire crew being killed. Only three men had died in the glider but within a matter of hours all of the survivors had been captured and shot.

A few months later, February 1943, a small team was inserted, this time by parachute, and they succeeded in severely damaging the heavy water plant. Operation FRESHMAN had cost the lives of forty-one men, seventeen in each glider and seven in the Halifax. Sadly, despite their courage and enterprise, they had achieved nothing. Some lessons had been taught, however, if only in the negative sense of the risks and limitations inherent in glider operations.

MORNING DISCUSSION

Mike Meech. I believe that the Albemarle used the early hole-in-the-floor method of dropping parachutists. As such, did it remain in use throughout the war – perhaps for Pathfinders?

Wg Cdr Colin Cummings. Yes – for Pathfinders. Certainly for OVERLORD – several Albemarles dropped members of 22nd Independent Para Coy. There is a quite famous photograph of them checking their watches before boarding. Having been rejected as a bomber, the Albemarle was also used as a fast transport for a while, operating a nightly service between the UK and Gibraltar, for example, and as a glider tug, of course, both for OVERLORD and MARKET GARDEN. Incidentally, apart from launching something like ninety conventional Albemarle/Horsa combinations from Manston, in the course of MARKET GARDEN Albemarles also towed about ten Hadrians, delivering several of them to LZs at Nijmegen, rather than Arnhem.

Sqn Ldr Peter Symes. An observation, rather than a question. As a child I lived near Portreath and one of my formative memories is of big four-engined aeroplanes towing smaller ones and on one occasion one of them coming back with the just the tow line whipping. I now know, of course, that this was Operation TURKEY BUZZARD, or BEGGAR, and it occurs to me that the considerable achievement involved in towing gliders across 1,200 miles of, mostly contested, airspace to Salé in Morocco and then on for another 1,000 miles to Tunisia deserves to be more widely recognised as a landmark event in purely aviation, as distinct from military, history.

Cummings. I quite agree. And if you have a look at Journal 46 you will see that I presented a paper on this Operation. In short, they ferried a couple of dozen gliders, in batches. Three or four didn't make it and two crews were lost. One crew actually ditched twice! The first time they were picked up by a British destroyer within 24 hours but the second time they were in their dinghy for eleven days before they were rescued by a Spanish trawler and taken to Portugal. It was a pretty demanding exercise, a 1,200 mile tow followed by another 1,000 or so, done in two stages, so each of the gliders had three pilots, permitting them to work in shifts to minimise fatigue.

Bob Kershaw. I'm an ex-Parachute Regiment officer. All three presenters have made some reference to inter-departmental in-fighting. What is the panel's view on the correct pecking order? Should 'airborne' have been air force led, or should it have been a primarily army effort? To take the German *Fallschirmjäger*, for instance, they were organised as an integral element of the *Luftwaffe* and that arrangement seemed to have worked very successfully. But my own research has not indicated that there was any desire to emulate their example.

Gp Capt Peter Hearn. I think that this issue really ought to have been resolved at the outset, but the RAF was reluctant to become too deeply involved – it certainly didn't want to divert any of its bombers from their primary tasks. The whole project was very dependent upon the sheer bloody-mindedness of individuals working at the coalface. Men like Louis Strange and John Rock. It was a bottom-up affair, rather than being led from above. We just didn't really get our act together.

Nicolas Livingstone. I think that some of the lack of direction may have arisen as a result of the early involvement of SOE. It had a co-ordinating function but it was also very secretive and for quite a long time, probably until Mountbatten came along, they didn't latch-on to the idea that you needed an overall task commander to oversee the whole process from concept to execution. The result was that you had a number of separate groups all wanting to exercise control while the RAF took the view that anything to do with 'the air' was their business. After all, it had only conceded control of the FAA to the Navy as recently as 1939 and it was disinclined to let anyone else exert any kind of control over other air operations. In the case of the Special Duties squadrons, for instance, the RAF considered that its job was done when the agents left the aircraft – beyond teaching them how to use a parachute, the RAF took no part in the training of agents. The air force was very clear about this – its interests were strictly confined to 'air' issues – anything, and everything, to do with aeroplanes and flying was theirs, but nothing else. Whether such an insular attitude was wise is moot, of course, but all of the Services had failed to grasp the need for someone to be in overall control. 'Combined Operations' was regarded as a bastard organisation that no

one really wanted anything to do with – and that included the Navy who more or less owned it.

Cummings. It is certainly true to say that the whole 'airborne' project was critically dependent on men like Strange and Rock working from the bottom up, but there were missed opportunities too. I am thinking of a Polish officer, Col Andrzej Marecki, a member of General Sikorski's staff, who visited Ringway in the early days and subsequently wrote a nine-page paper outlining how it ought to be done – in a 'combined' sense – based on his previous experience with the Polish Army, who were several years ahead of us at the time. The concerned staffs noted Marecki's advice but declined to implement much of it, preferring to learn the hard way. Interestingly, when Terence Otway wrote the official history, *Airborne Forces*,[1] he made no reference to Marecki nor to the significant contribution that had been made by a group of refugee Polish Army parachutists when the school at Ringway was first being established. That was, I think, a missed opportunity.

Richard Bateson. No one has mentioned the Airborne Forces Experimental Establishment (AFEE) which was formed at Ringway before moving to Sherburn-in-Elmet and Beaulieu before being absorbed by Boscombe Down in 1950. It had a hand in most of the techniques that have been discussed this morning but it also did some interesting work in the context of clandestine operations which involved a Barracuda fitted with a pod under each wing. Each pod contained two agents who were to have been dropped through a pilot-operated trapdoor. Does anyone have any idea how the agents might have felt about that?

Hearn. Well I have to admit that pressure of time meant that we did skip over the AFEE but its contribution was, of course, very significant. That said, much of the work that it did, like the Barracuda, never came to fruition. They did do some very interesting things – a blank gore parachute, for instance, which was quite revolutionary at the time, but it never became operational – and that was the case with

[1] Otway, Lt Col T B H; *Army Airborne Forces in the Second World War* (London, 1990 – IWM facsimile of the classified original of 1951).

Barracuda, P9795, fitted with a two-man capsule under each wing. Live drops were made from these, but the technique was not employed operationally.

many of its wartime projects.[2] Later on Boscombe Down made a major contribution to post-war developments in the field ranging from work on the design of parachutes, clearing aeroplanes for dropping, refining the procedures to be used and inventing and/or adapting role equipment.

Livingstone. Just a thought in the context of delivering agents. This was done during WW I, typically using a BE2, with the agent in the front cockpit or, I believe, sometimes climbing out to lie on the lower wing whence he dropped off after the pilot had touched down. But there was reportedly a later system that involved the agent being in the rear cockpit, which had a trapdoor in the floor, wearing a harness fitted with a static line attached to a parachute in a container anchored to the airframe. The idea was that the pilot would operate the trapdoor,

[2] Among the more remarkable wartime projects worked on by the AFEE were Hafner's Rotachute and Rotabuggy, towed 'rotor kites' (ie unpowered autogiros with lift provided via a free-wheeling rotor), in the latter case attached to a Jeep. Another was the Baynes Bat, a one-third scale flying wing glider that, had it been fully developed into a full-sized model, would have been strapped to a tank to permit it to be towed to the battlefield. **Ed**

the guy would fall out and his parachute would open automatically. It is said that when they first tried it, the agent changed his mind at the last minute which left him clinging on by his fingertips while dangling out of the door – the pilot eventually had to rap his knuckles to persuade him to let go! (*Laughter*)

John Peaty. We heard this morning about small scale operations, typically conducted at night. We did this, in part, because we were constrained by the lack of trained manpower and suitable aircraft and we did not have air superiority. But I think that there was more to it – that there was a major difference between our approach and that of the Germans. They dropped *en masse*, in daylight – we were doing it with very small numbers in the dark. It did change later on, but I think that there was a basic conceptual difference in the early days. Would anyone care to comment on that?

Livingstone. I think that the air superiority aspect will have been the major issue. Until 1943 we just didn't have it and the unarmed Dakota simply wouldn't have survived in a hostile air environment, which more or less confined us to night ops.

Sir Rupert Smith. Conceptually, what you are doing when you deploy airborne forces, whether they arrive by glider or parachute makes no difference, is to take advantage of the 'air flank' that you have been able to create – so air superiority has to be a given. You can take advantage of this by conducting operations or raids which while small in scale may have great significance, but if you are really going to exploit this capability it needs to be done as part of a 'manoeuvre'. But to do that you have to have commanders who can exercise control on this scale but we just didn't reach the necessary level of sophistication until the second half of the war. A commander is simply not going to place any reliance on a capability in which he has no confidence. There were generals thinking in terms of manoeuvre from the early days, Wingate being an example – and not just in India. A number of senior generals were encouraging him to try out his ideas, but at the time he simply lacked the tactical capabilities that he needed in order to put them into practice. To put it another way, you need commanders and headquarters – a chicken – but you also have to have an egg – like commandos or airborne forces. But we just didn't get it

together until 1943 and until then the Army, as a whole, hadn't really been thinking like that. Indeed in 1939 we had been thinking more like the French with their Maginot Line – we didn't actually build one, of course, but the prevailing mindset was more to do with static defence than offensive manoeuvre.

Cummings. I would just add that the use of airborne forces on a large scale can be unaffordably expensive. The Germans suffered such massive losses in Crete in 1941 that they never attempted another airborne operation of any significance. After HUSKY in 1943, when both the British and the Americans also sustained very heavy casualties among both parachutists and air-landed troops, there was a major review of the concept of airborne forces. One school of thought advocated scaling back to commando-style raids while the opposition argued for maintaining the aim and sticking with large scale operations. The latter won and three airborne divisions took part in OVERLORD with similar force levels being committed at Arnhem and again in crossing the Rhine. But by the end of the war airborne troops may have had their day – and gliders almost certainly had.

Gp Capt Kevan Dearman. A short anecdote. Back in the early '90s, when I was Gp Capt Programmes at HQ Strike Command, a member of my staff informed me that we were having problems replacing the winches for the balloons at Weston-on-the-Green. I told him to keep at it and see what he could do. He came back a couple of days later to tell me that the balloons were filled with hydrogen and, more to the point, that no one had ever cleared them for use by personnel so he recommended that we really ought to do something about it. So we did – we made the problem go away by putting the balloons out to contract. (*Laughter*)

Hearn. Yes – we don't like to talk about that . . . That said, they did have a lightning conductor on the front! In fact we did lose the occasional balloon as a result of a lightning strike, fortunately never with anyone on board. I don't suppose that anyone here can provide an explanation, but for some reason responsibility for balloons was transferred from the Engineering Branch to the Marine Branch. Why was that appropriate? One of those unexplained mysteries I suppose.

MOVEMENT AND RESUPPLY OF GROUND FORCES IN BURMA, 1942-45

Roger Annett

Roger joined the RAF via Cranwell in 1959. Graduating as a pilot, he flew Argosys in Singapore and, as a QFI, with London UAS, but he left the Service in 1969 to join the fledgling British computer industry. He operated internationally, including running ICL's business with the Soviet Bloc and spending three years in Stockholm. Since retirement he has written, thus far, four books dealing with the RAF and focusing on transport and helicopter operations.

I am sure that this audience will already be aware that the Burma Campaign of 1942-45 was, at 5,500 miles from home and three-and-a-half years in duration, the most remote and longest lasting ground engagement involving British forces in the Second World War.

Within 100 days of the devastating air attack on Pearl Harbor on 7 December 1941, the Netherlands East Indies and British Borneo, Malaya and Singapore had all been occupied; the Royal Navy had withdrawn to Ceylon and, most of the RAF in the region having been destroyed, the remnant had escaped to Australia or fallen into captivity. French Indo-China and Thailand had already been occupied and a Japanese force of three divisions, 70,000 troops, was poised on the Siamese border, ready to advance into Burma. Their strategic aims were to cut the Burma Road, in order to prevent American supplies from reaching the Nationalist Chinese forces, and to occupy the whole of the country and, possibly, use it as a springboard for an attack on British India.

But it was to be a demanding task, because Burma is the last place in the world where one might choose to pick a fight. Larger than France, the country is encircled west, north and east by mountains up to 12,000 feet high. Its coastline, mostly mangrove and mud, stretches some 1,300-miles and between June and November the SW Monsoon delivers more than 200 inches of rainfall, mostly in the coastal regions.

A self-governing British colony in 1941, Burma had very few

roads and just one railway. The main means of transportation were elephants and four major rivers – the Salween, Sittang, Irrawaddy and Chindwin. With jungle and bamboo growing on the slopes up to 6,000 feet, paddy fields and mud on the plains, which turned to choking dust in the dry season when temperatures can reach 45ºC, and malaria and other diseases endemic, the theatre was a military man's nightmare. But, as well as being the route to India, Burma was also rich in the resources that the Japanese needed – in particular rubber, oil, tungsten and rice. So, in January 1942, they struck, and so began the longest fighting retreat in British military history.

Gallant missions were flown in defence of Rangoon by Buffalos and Hurricanes of the RAF, together with P-40s of the AVG, but they were outnumbered by the Japanese Army Air Force. Rangoon fell on 8 March and most of what remained of allied air power in Burma had been withdrawn to India before the end of the month. The RAF maintained a presence at Lashio for a while but, with the Japanese only 30 miles away, that had to be abandoned in late April. The remaining echelon retreated across the Chinese border to Loiwing before moving on to take up residence permanently at Chengtu, but by taking Lashio the Japanese had achieved their first objective – they had cut the Burma Road.

Meanwhile, elsewhere in Burma the Japanese had been hindering the British retreat by leap-frogging ahead of the motorised columns of General Slim's BURCORP – numerically strong, but ill-prepared – blocking the road and engaging the suddenly disorganised troops. However, fresh from its recent triumphs in North Africa, the 7th Armoured Brigade had reached Rangoon in the nick of time. Thanks to the roadblock-busting operations of its Stuart tanks, by the end of May, sick and bedraggled and having lost much of its equipment, the remnant of BURCORP straggled over the border into Assam having tramped through some 800 miles of mountainous terrain, jungle and swamp.

By that time, the Japanese were already at the Indian frontier, but then the monsoon broke. Battle lines stabilised around three main areas: the coastal hills of the Arakan peninsula; behind the Chindwin River to the east of the main British base of Imphal; and the wild Northern Provinces bordering China, where a force of American-led Nationalist Chinese troops had retreated to Ledo.

No 31 Sqn still had a few legacy Valentias on charge in early 1942 and these were pressed into use during the evacuation of Burma.

Throughout the remainder of 1942, both sides licked their wounds and regrouped for the campaigning to come. During the retreat, Slim and his staff had seen something of the potential of air transport. Using two of its recently acquired DC-2s, most of which were in Egypt at the time, No 31 Sqn had begun a shuttle service between Rangoon and Calcutta as early as December 1941. By mid-February 1942 the squadron had recalled its aircraft from the Canal Zone and the airlift had increased considerably in intensity. Supplemented by a couple of venerable Valentias, the priority had become the evacuation of refugees and wounded with aircraft carrying as many people as could be crammed aboard. In his report on the retreat, Slim wrote: 'Most of us had long ago recognised that air transport could solve some of our worst problems, but as yet we had no transport aircraft.'[1] As he rebuilt BURCORP into the 14th Army of 300,000 men, therefore, he made logistics his priority and, in the forefront of that, the ability to control the air – a prerequisite for the air transport operations that would be needed to move and support his men in the inhospitable Burmese terrain.

By the turn of 1943, as well as building extensive new roads to and across the border, constructing much-needed airfields and obtaining the aircraft to fly from them, Slim's staff had also put together the world's first air-supply organisation. By February, Slim felt confident enough to test that organisation with a sally behind Japanese lines, Operation LONGCLOTH – the first Chindit expedition. The Chindits

No 31 Sqn operated about a dozen ex-US airline DC-2s. This one, AX755, previously with Delta Airlines, was written off at Akyab on 13 April 1942.

were the brainchild of a maverick, driven infantry officer, Brigadier Orde Wingate, who had seen, in the Abyssinian campaign of 1941, what guerrilla troops had been able to achieve against less flexible Italian regulars. 'Chindit' was a name dreamt up by Wingate himself – he had misheard the name 'Chinthe', the mythical beasts that guard the myriad temples of Burma.

LONGCLOTH was originally set up in support of a planned Nationalist Chinese two-brigade incursion from Yunnan Province. The Nationalist leader, Chiang Kai-Shek, manoeuvred his way out of that obligation but Slim decided that the operation should go ahead anyway, with the objective of giving the Japanese their first bloody nose and his own men a much-needed boost to their shattered morale. It would also serve as a test for a future long range penetration in force, planned as an early thrust in the liberation of Burma.

Consequently, on 7 February 1943, Wingate marched 3,000 men – mostly run-of-the-mill British Army infantrymen, conscripts from Liverpool reinforced by Gurkhas – in eight columns across the border and then across the Chindwin. The soldiers were accompanied by more than 1,000 mules and each column included at least two RAF wireless operators, for the force was to be entirely supplied by air. By this time No 31 Sqn had already begun replacing its tired DC-2s and had available for immediate use by its forward detachment three, the

first of many, of their larger and more powerful derivatives. Forerunners of the iconic Dakota, they were an ex-commercial DC-3 and a pair of ex-USAAF C-53 military transports. These were supplemented by the Lockheed Hudsons of the recently formed No 194 Sqn.

The sorties they flew involved navigating, with no radio aids, sometimes through tropical storms and extreme turbulence, across mountainous jungle to find clearings hacked out of the bush by Chindits using machetes and grenades. Assisted by the wireless operators on the ground, the aircraft would run in at between 300 and 500 ft, straight and level at 100 kt – a sitting duck for both enemy fighters and ground fire – while the load was manhandle to the rear door. When the green light came on, the packs nearest the door were pushed out to float down by parachute. The aircraft would then go round again to repeat the exercise up to a dozen times.

It did not always work like clockwork. Japanese fighters could still be encountered; DZs were not found or had to be abandoned under enemy fire; packs that missed the DZ could be irretrievably hung up in tall trees and so on, but Nos 31 and 194 Sqns flew 178 sorties, delivering 300 tons of vital supplies. The Chindits were able to march some 1,000 miles, creating mayhem wherever they went. It was a major and much-needed boost to Allied morale. By confronting them in their own strongholds LONGCLOTH had demonstrated that the Japanese were not invincible and, even more importantly, it had proved that it was possible to use air power to maintain a force in the jungle.

Nevertheless, the cost had been high. More than 800 men failed to return and 600 of those who made it back to India were assessed as being unfit for further service. During both the march-in and the struggle to get out, jungle diseases, thirst and exhaustion had killed many more men than had the enemy. A way had to be found both to insert and to extract the columns by air.

One incident showed very clearly what might be done to get them out. On 25 April (Easter Sunday) a party of Chindits, more than 200 miles behind Japanese lines, found themselves struggling. One of the surviving RAF wireless operators got a message through to 31 Squadron, passing an estimated grid reference. They laid out a message in strips of parachute silk saying ‘PLANE LAND HERE’. Fg

Off Mike Vlasto and his crew managed to fly their Dakota to the spot, where they pulled off an improbable downwind landing in an 800-yard jungle clearing. Twelve minutes later they took off again with seventeen sick and wounded Chindits on board. It was to be the first of many such casevacs in Burma. Incidentally, this Dakota (a proper militarised C-47) would have been one of the first to reach the squadron; eight were allotted in April and by the end of May it had twenty of them.

At the Quebec Conference in August 1943 the Combined Chiefs of Staff created a joint South East Asia Command (SEAC) and agreed to the appointment of Admiral Lord Louis Mountbatten as Supreme Commander. He lost no time in boosting fighter and bomber strengths in a bid to wrest command of the skies over Burma from the Japanese.

The main problem was the Nakajima Ki 43 'Oscar', the Japanese Army's equivalent to the Navy's 'Zero'. The answer was the Spitfire. Burma was, and still is, infamous as a 'forgotten campaign' – thousands of miles from the European and Mediterranean fronts and always last in line for men and equipment. But as later marques of Spitfires became available in Europe, the obsolescent Mk V could finally be sent to India. The Spitfire V could outperform the Ki 43 and its firepower turned the Japanese fighter, which had no armour and lacked self-sealing fuel tanks, into a deathtrap. By New Year 1944 the RAF's Spitfires and Hurricanes, together with American Mustangs and Lightnings, had established a measure of control in the skies over Burma and the scene was set for a second, this time major, Chindit-style offensive.

The plan this time was to fly-in the initial troops by glider – Operation THURSDAY. This first wave would comprise American pioneers who would, while being protected by accompanying Chindits, build airstrips 200 miles behind Japanese lines. These landing grounds were to be capable of handling American C-47s and/or British Dakotas which were now available in quantities sufficient to deliver and resupply substantial numbers of troops.

These men would seek to sever enemy lines of communication in support of Maj Gen Stilwell and his American and Chinese troops, advancing southwards from Ledo down the Hukawng Valley, 'dragging a road and an oil pipeline behind them' with the objective of reopening the Burma Road to China.

American engineers take a break in the shade of a wrecked CG-4 at Broadway.

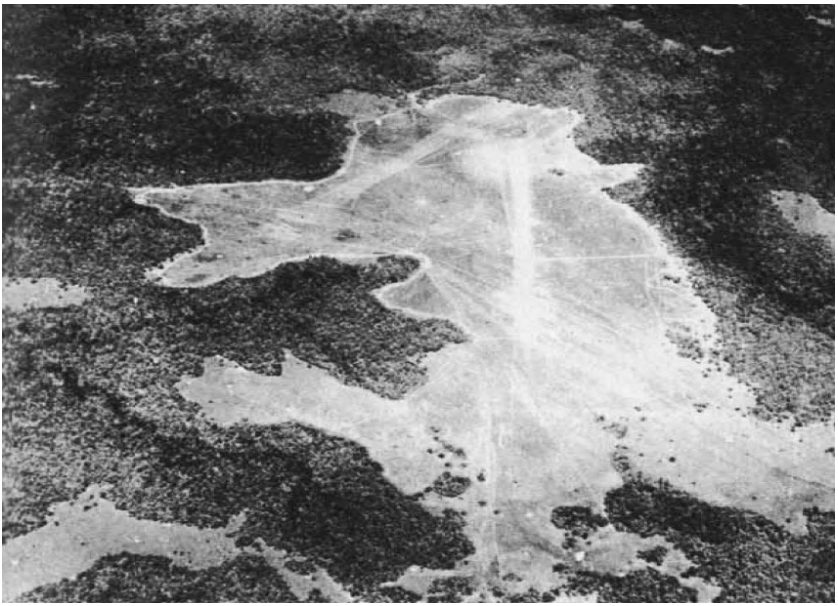
This time, Wingate commanded no fewer than six brigades – manned by British, Indian, Gurkha and African infantrymen. Four brigades were to be delivered by air; one would march overland and the sixth would be held in reserve. In early February 1944, 2,000 men of the 16th Brigade began their march from Ledo to protect the right flank of Stilwell's force and then, on the night of 5 March from their base at Lalaghat, south west of Imphal, C-47s of the USAAF's 1st Air Commando Group hauled sixty-one WACO CG-4A gliders into the darkening Assam sky, two to each tug. Their route required them to climb over the 8,000 ft Chin Hills before flying on to cross the Chindwin River. The lightly constructed gliders, most carrying up to 17 men and their equipment, others loaded with Jeeps and bulldozers, were tethered to their tugs by nylon tow-ropes 350 ft long. Unable to clear the mountains, many combinations were obliged to turn back and in other cases tow-ropes broke leaving the gliders to crash-land short of their destination. Nevertheless, thirty-two reached the landing ground. Codenamed 'Broadway', it was actually no more than a

The Clark CA-1 Tractor and LaPlant-Choate CAB-1 pan scraper that were instrumental in levelling an airstrip at Broadway.

natural, and very rough, clearing in the jungle. Furthermore, it was dark!

Within that clearing there was chaos. The Pathfinders, who had landed only shortly before the first wave began to arrive, did their best to arrange the lighting to indicate the least dangerous places but it was impossible to prevent gliders from plunging into water-buffalo holes and smashing into trees, as well as into each other. One of the wireless operators eventually managed to get 'on net' in time to stop any further combinations being launched and to recall some of those that were already airborne. Despite this, twenty-three men died and thirty were badly injured during the initial landings. Miraculously, however, 400 American engineers and Chindits had survived. Among the US engineers was a 2/Lt R C Brackett, who found that two bulldozers had had also survived, slightly bent but still operational.

Fortunately, and perhaps distracted by the random arrival of some of the gliders that had been forced to land en route, the Japanese had failed to realise what was happening. The Americans immediately set to work with their bulldozers, supplemented by picks and shovels. After a herculean effort, by dusk on the 7th, the engineers and Chindits had, between them, levelled the clearing sufficiently to provide a 1,000 yard strip. That night C-47s and Dakotas began landing by the light of the moon and gooseneck flares. It was an



Before it was abandoned, Broadway had had three strips cleared.

extraordinary display. Impressed, AVM John Baldwin, commander of the Third Tactical Air Force, wrote:

> 'Nobody has seen a transport operation until he has stood at Broadway under the light of a Burma moon and watched Dakotas coming in and taking off in opposite directions on a single strip at the rate of one take off or one landing every three minutes.'[2]

On 13 March Brigadier Wingate was equally upbeat, noting in an Order of the Day that the Chindits had been 'inserted in the enemy's guts . . .'[3]

With the initial airhead established, the operation expanded rapidly. Over the next five days, RAF Spitfires and American L-1 Vigilants flew into Broadway, where two further landing strips had been cleared. In a joint operation, 39 USAAF C-47s, together with 44 RAF Dakotas flew 500 sorties (and the gliders another 78) transporting 250 tons of equipment and supplies, close to 1,500 pack animals and some 9,000 Chindits. The fly-in was complete.

A Stinson L-5 of the 1st Air Commando Group with the stretcher compartment open.

Operation THURSDAY had run for six days and six nights. The gliders' loss rate had been 85%, mostly from the first wave. The only other air loss was a C-47 that collided with a water buffalo while landing at Broadway at night. Senior officers immediately flew to General Eisenhower's HQ in England to provide his staff with reports on the experience gained from the operation, since this information would clearly be of assistance in planning for D-Day.

Meanwhile, the Chindits had spread out in all directions, tearing up railroad tracks, destroying supplies and even engaging the enemy in pitched battles. Stilwell's advance was free to gather pace and within a year, the Burma Road had been reopened.

This time, the Air Staffs knew how to get the Chindits out again. Mountbatten had insisted on the provision of a comprehensive casevac organisation. Casualties were picked up by American L-5 Sentinels, backed-up by some Stinson L-1s and RAF Tiger Moths, and then flown out to India in Dakotas and gliders. By 1945, No 194 Sqn was operating its own Sentinel-equipped Casevac Flight, and in March 1945 it introduced a new and daring technique – glider snatch. The procedure was described by Norman Currell, a 31 Squadron Dakota pilot, as follows:

'When a message came in that there had been a number of

To avoid it's being damaged by the hook suspended beneath the aircraft, when using the snatch technique the glider was positioned at an oblique angle to the flight path of the tug.

casualties on a battlefield, we'd tow a glider over, or use one already there. The chaps on the ground would turn it into any wind there was, and load the casevacs on board. In the meantime the Pickup Station would have been set up – two poles, ten feet long and twenty feet apart. A loop of nylon hawser would be fastened to a hook on the nose of the glider and strung across the tops of the poles.

The 'glider 'pick-up' Dakota was fitted with a seventeen foot boom which could be lowered by a crew member. Along this boom ran a wire cable with a heavy hook attached at the end. The other end of the cable was attached to a winch which was bolted under the central mainplane.

We'd circle overhead – machine-guns mounted, watching out for fighters – waiting for the signal that all was ready. Then we'd come in into wind at 1,000 feet, and throttle back for a dive to 140 miles per hour. We'd swoop in at twenty-five feet or so over the glider – exciting stuff. The drill was that the hook would then grab the hawser, taking up the slack. The hook would then come off the boom and pay out for two seconds. Then, after another three seconds an automatic brake would stop the cable running out. After that, it was, 'Full Throttle' and hey presto, if all went well the glider was picked up – having accelerated from zero to 105 mph in five seconds!

In operation it was a tricky manoeuvre but if all went well, and it usually did, the glider and its occupants were on their way to the

One of No 230 Sqn's Sunderlands picking up casualties at Lake Indawgyi.

nearest medical station. It was well worth the risks.[4]

Other aircraft braved the Japanese fighters and the weather to get the Chindits out. Two Sunderlands were flown to a forward base at Dibrugarh on the Brahmaputra in northern Assam by crews of No 230 Sqn. Their subsequent sorties involved climbing over the 10,000-foot mountains bordering Burma. Once over Japanese-held territory they would fly at tree-top height to Lake Indawgyi, where the Chindits were operating. Nicknamed 'Gert and Daisy' by the troops, the Sunderlands (one of which was lost during the 32-day operation), were credited with having evacuated 537 sick and wounded.

The men were well aware that the Japanese and their Burmese collaborators murdered Allied wounded. Tragically, the inability to move men who had been seriously wounded during Operation LONGCLOTH, had meant that there had been no alternative but to leave them where they fell, with just a water flask and a grenade. Hence Mountbatten's insistence that Operation THURSDAY was to include a casevac facility and that his troops should be made aware of it; it was an inestimable boost to morale. The surviving Chindits were withdrawn after four months of continuous action but by this time, General Slim and his commanders had other matters on their mind.

On 8 March 1944 the Japanese had launched their invasion of India. After the failure of an earlier thrust in the Arakan – where, thanks to air supply, the Allies had been able to stand their ground and win their first victory of the campaign – the Japanese, crossed the

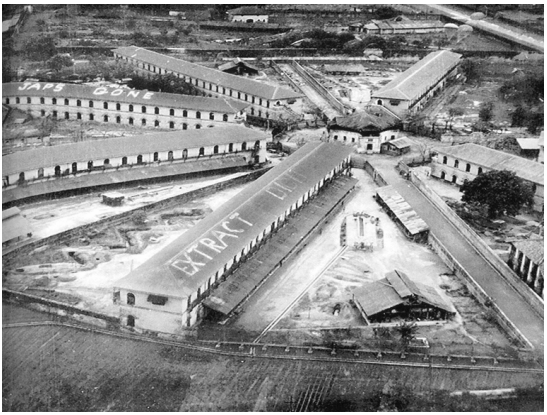
A 20mm anti-aircraft gun being coaxed aboard an RAF Dakota..

border into Assam where they surrounded the British bases at Imphal and Kohima. There their advance stalled, blocked by the be-sieged defenders who were sustained and reinforced by air. For the first time in a major battle, an entire division was airlifted from one front to another – the 5th Division was moved from the Arakan to Imphal in 758 sorties flown by USAAF C-46s and the Dakotas of No 194 Sqn. Mountbatten had persuaded his airmen to fly, and his troops to fight, throughout the monsoon. By contrast, drenched and chilled in the Chin Hills, the Japanese had no air supply. They ran out of ammunition, rations and fighting spirit – it was the turn of the tide.

General Slim saw his chance and, as soon as the monsoon eased in October, he launched 14th Army's counter-attack. By the night of 3 December, Slim's troops were crossing the Chindwin. In a brilliant campaign, they drove the Japanese back 800 miles to Rangoon, and eventual surrender. To maintain its momentum, the Army needed 2,000 tons of supplies every day, all of which were delivered by air.

The operating range of a fully-laden Dakota was 250 miles out and back. As the Army overran the Japanese airfields, the RAF Regiment took possession so that the tactical squadrons could move forward to support the next stage of the advance. But the RAF did not do it alone. In January 1945, the Ledo Road reached the Old Burma Road NE of Mandalay. With road convoys now able to drive into China, this released American transport aircraft which now became available to assist in the re-supply of Slim's army.

By the end of April, 14th Army had advanced 600 miles in four months and the race was on to reach Rangoon before the rains came. The Japanese had conducted their last naval operations in the Indian



Rangoon jail with 'JAPS GONE' and 'EXTRACT DIGIT' painted on the roof.

Ocean in March of the previous year and the Royal Navy was back in the Bay of Bengal. That meant that Mountbatten could use the west coast ports of Burma and he decided to launch a bold 300-mile combined operation from Akyab with the aim of re-taking Rangoon from the sea.

Apart from replacement wireless operators dropped to the Chindit columns, there had been little use of paratroops in Burma but on 2 May, the Gurkhas of 50th (Indian) Parachute Brigade, jumped from a 38-strong mixed force of C-47s and Dakotas and neutralised the guns at Elephant Point. That permitted the landing craft carried by the Allied flotilla to be launched and sail up-river towards Rangoon but before they reached the city, they were hailed by a sampan carrying Wg Cdr A E Saunders, OC 110 Sqn, and his navigator, Flt Lt J B Stephen. On a reconaissance mission that morning, they had flown their Mosquito over the gaol where two messages had been painted on the roof: 'JAPS GONE' and 'EXTRACT DIGIT'. That piece of RAF slang convinced Arthur Saunders that it was a genuine message from the prisoners so he landed at Mingaladon and found that the Japanese had indeed abandoned the city and withdrawn to the east. He was able to intercede in time to prevent the city from being bombarded by the Navy. General Slim was unperturbed at having had his operation cancelled by the RAF. Indeed, he wrote:

> 'We were rather pleased about this in the Fourteenth Army. If we could not get to Rangoon first ourselves, the next best thing was for someone from 221 Group, which we regarded in all comradeship to be part of the Fourteenth Army, to do it.'[5]

The British had reached Rangoon just in time, for two days later,

and two weeks early, the monsoon broke. In August the Americans dropped two atomic bombs on Japan and the Japanese surrendered; they had lost more than 144,000 men in Burma. The campaign had also cost the Allies over 70,000 casualties, the majority of them Indians. In the major air supply effort, between December 1943 and September 1945, the RAF had lost 96 Dakotas and the Americans a similar number of C-47s. But the campaign aims of the Allies had been achieved. India had been made safe; the road to China had been reopened and Burma had been liberated. The key to success, from first to last, had been the use of air power, and specifically, air transport.

This continued to be the case in the immediate aftermath when thousands of liberated Allied POWs were flown to safety by 'Dakota Airways' from camps in the Netherlands East Indies, where Mountbatten's forces had been given the messy task of holding the fort against Indonesian nationalists pending re-establishment of the Dutch colonial administration. Hostilities continued until the British withdrew at the end of November 1946.

The only air transport unit in the theatre on the outbreak of war, No 31 Sqn, was still there at the end. Having flown a remarkable 11,000 sorties in the year that it had spent operating from Singapore and Java, the squadron disbanded on 30 September 1946, bringing to an end thirty-one years of continuous service in India and the Far East.

Notes:

1 Field Marshal Viscount Slim; *Defeat into Victory* (Cassell, London, 1956) p143.

2 Thompson, Sir Robert; *Make For The Hills* (Leo Cooper, Barnsley, 1989) pp50-51.

3 Quoted by, for instance, Trevor Royle in his *The Cameronians: A Concise History* (Edinburgh, 2009).

4 Annett, Roger; *Drop Zone Burma* (Pen & Sword, Barnsley, 2008) pp131-132.

5 Slim; *op cit*, p507.

AIRBORNE OPERATIONS: FROM NORMANDY TO VARSITY

Dr Sebastian Ritchie

Seb Ritchie obtained his PhD from King's College, London, in 1994, and lectured for three years at the University of Manchester before joining the Air Historical Branch. He is the author of numerous classified histories of recent RAF operations in Iraq, the former Yugoslavia and Libya, and has also lectured and published widely on aspects of air power and air operations in the Second World War. Among his several books, his work on Arnhem is of particular relevance to this seminar.[1]

This paper surveys the role of the Royal Air Force in the three major airborne operations mounted in support of the Allied campaign to liberate Northwest Europe in 1944 and 1945 – the airborne dimension of Operation NEPTUNE in Normandy, Operation MARKET in Holland and Operation VARSITY, the Rhine crossing staged in March 1945. Over time, historians have tended to view the Normandy and Arnhem operations in isolation. The airborne missions in Normandy are typically addressed as part of the wider story of Operation NEPTUNE, while much of the published literature on MARKET implies that airborne warfare started and finished in September 1944.[1] When the two operations are linked, it is often via the simplistic notions of airborne victory in Normandy and airborne defeat in Holland, implying doctrinal regression in the intervening period and a failure to apply the key lessons that Normandy bequeathed. VARSITY is then represented as a corrective that successfully addressed the many and varied planning failures responsible for the Allied defeat at Arnhem.[2]

While this depiction is valid in certain respects, it is deeply flawed in others. The perception of airborne victory in Normandy is based primarily on the more general success of Allied operations, while very different and much narrower criteria tend to be employed where

[1] Ritchie, Sebastian: *Arnhem: Myth and Reality – Airborne Warfare, Air Power and the Failure of Operation Market Garden* (Robert Hale Ltd; London; 2011).

MARKET is concerned. It is easily forgotten that the Allies depended far more heavily on the airborne at Arnhem than they did in NEPTUNE, and that victory required an entirely unprecedented level of airborne mission success. Subsequently, in VARSITY as in Normandy, the airborne assault was a component part of a broader operation but was not, ultimately, the decisive factor in the Rhine crossing plan. In short, in all three cases, there is a need to assess the airborne role in its correct historical context if it is to be properly understood.

This is very much the aim of the following analysis. The success or failure of each combined operation is not the issue. Rather, the central question concerns the outcome of the airborne missions and the role of the RAF in the development of airborne warfare during the Northwest Europe campaign. The RAF's contribution is addressed in relation to the basic Allied airborne operational concept, the many and varied challenges that it generated, and doctrinal development during 1944 and 1945. The key air lessons gathered from one operation to the next are also assessed, together with their subsequent impact on planning. Via this approach, it is possible to establish a number of clear continuities in the story of the RAF's association with the airborne medium, extending from the Allies' first large-scale use of airborne forces through to the end of hostilities. Yet this evolving relationship was complex, to say the least, and does not readily align with the generally accepted view of a regressive failure in MARKET that was subsequently corrected in VARSITY.

There is a vast literature dealing with the history of the airborne forces, and with airborne operations in the Second World War. Yet so much has been published that it is, perhaps, all too easy to lose touch with some of the fundamentals of the subject, not least the elementary question of why airborne forces should have been needed at all. Yet this is directly relevant to the first of the three operations with which this study is concerned. While a number of arguments were advanced, there was one basic contention that effectively decided the issue in Britain. Sooner or later, it would be necessary to open a second front with Germany. Allied forces would have to attack heavily defended beaches to secure a foothold on mainland Europe. In such circumstances, it would obviously be very useful if airborne forces could be dropped behind the enemy's coastal defences, in support of

The difficulties involved in executing accurate airlifts in darkness, after a long approach over water, as in Operation HUSKY, led to many gliders landing short.

the amphibious landings.[3]

The case appeared unanswerable, and so it was that two airborne divisions – 1st and 6th Airborne – were generated to fulfil this very specific purpose. In the process, airborne operations were effectively subordinated to amphibious operations and amphibious landing doctrine, which, in the British case, espoused the concept of the dawn assault, exploiting surprise, rather than the long-term softening up that characterised American operations in the Pacific. But, if the amphibious forces hit the beach at daybreak, what were the implications for the airborne? Clearly, they would need time to secure their objectives before the beach assault began, which meant landing several hours before dawn, during the hours of darkness. This was in marked contrast to German airborne doctrine, which was firmly based on the principle of the daylight airlift, as night-time landings were deemed too difficult and hazardous.

Operations in North Africa at the end of 1942 offered only limited scope to test the concept, so it was not until Operation HUSKY, the landings in Sicily in the following year, that the Allies were compelled to confront the extreme complexity of the task that they had taken on. Only then, in the most brutal circumstances imaginable, did they begin to comprehend the exceptional challenges involved in executing accurate airlifts in darkness, after a long approach over water, in live

operational conditions. In HUSKY, the simple truth is that the Allies saddled themselves with an airborne delivery plan that lay far beyond the capabilities of their aircrew, or indeed the aircrew of any air force then in existence.[4]

Predictably enough, HUSKY was followed by a veritable outpouring of airborne lessons and doctrine papers.[5] Many different issues were considered, but there was a particularly strong focus on the airlift. It was accepted that air issues had to be addressed with far greater care in future airborne operations, with much more influence being given to the theatre air commander. It had to be recognised that successful lifts and landings were weather dependent; the high command had therefore to rule on whether airborne missions were essential to the success of broader ventures, such as amphibious operations. If essential, these other operations might have to be delayed until weather conditions were suitable for the airlift.[6] Aircrew training, especially in night navigation, required far greater attention: 'Aircrews participating must therefore be trained to an operational standard. In particular, pilots require intensive training in low flying, navigation over sea, and in judging distances by moonlight. All the aircraft crews must have some preliminary operational experience . .'[7]

The post-HUSKY post-mortem was thus very thorough. But it was one thing to write lessons and doctrine papers; implementing key findings and recommendations was never likely to be so straightforward. How far, then, was it possible to exploit the lessons of Sicily in Operation NEPTUNE, the opening phase of Operation OVERLORD, in Normandy in 1944?

The air command, control and planning provisions established for Normandy were unquestionably superior to the fragmented machinery employed before the Sicilian landings. Responsibility for the airlifts into Normandy was placed under the Air Commander-in-Chief, Air Chief Marshal Sir Trafford Leigh-Mallory. A so-called Airborne Air Planning Committee was created to co-ordinate the airlift with other parts of the plan and, at divisional level, for the British operation, 38 Group and 6th Airborne Division set up a joint headquarters to ensure the closest possible collaboration.[8] Yet a fundamental problem remained: the Normandy airborne operation, like HUSKY, would not be treated as an operation in its own right. Rather, both the airborne mission and the accompanying airlift would be moulded and shaped

around the amphibious landings in a manner that lay very largely beyond the Air Commander's control. Leigh-Mallory's well known dislike of the American airborne plan provides one obvious illustration. Despite his misgivings, he was compelled to accept the plan in deference to the requirements of land commanders such as Montgomery and Bradley, and he had later to accommodate wholesale revisions to their requirements only a few days before D-Day. His concerns proved only too well founded: the American landings were both inaccurate and widely dispersed.[9]

In the British sector, the task facing 6th Airborne Division was to establish a bridgehead on the eastern bank of the Orne River, and subsequently to extend the eastern flank of the Allied assault area outwards to the River Dives. The airlift task was expected to be reasonably straightforward where the central and southern drop zones, N and K, were concerned. The obvious exception was the *coup de main* at Pegasus Bridge, but intensive mission-specific preparation involving 43 rehearsals ultimately allowed this vital mission to be executed successfully.[10] The landings at the northern drop zone, DZ V, posed far greater problems. Here, the task was to neutralise the Merville Battery – a major threat to Sword beach. For the airborne, this was a particularly awkward target, as it lay so close to the sea.

The commander of 6th Airborne Division insisted that he needed a drop zone no more than two miles from the battery. To the north was the sea; to the west lay the Caen Canal and Orne River; south of the battery, the terrain was wooded and undulating. The only flatter and more open country lay to the east, but it was immediately adjacent to the River Dives valley, which had been flooded by the Germans and therefore posed a lethal threat to the heavily laden British and Canadian paratroops. Nevertheless, as there was no feasible alternative, it was in this area that DZ V was located.[11]

A direct route from England to the drop zones would have taken the troop carriers over the Allied invasion fleet. As HUSKY had shown, naval vessels were unable to distinguish between friendly and hostile aircraft at night, so there was a serious danger that Allied shipping might open fire on the overflying troop carriers and glider combinations.[12] It was thus necessary to route the airborne armada further to the east, in the direction of Le Havre, where there were strong German anti-aircraft defences. To avoid Le Havre, and to cross

C-47s of the Cottesmore-based 37th TCS, 316th TCG and WACO CG-4 gliders in June 1944.

the Normandy coast at the correct location, the RAF transports would now have to effect a sharp turn over water, in darkness, before making their final approach from the north-east.[13] Such manoeuvres had caused considerable navigational problems during HUSKY, and the outline of the Normandy coast would offer little assistance to the aircrew. The coastline between the Orne and Dives estuaries is flat and featureless and, while the ports of Cabourg and Ouistreham are distinctive topographical features, they are also quite similar in appearance.[14]

If the aircraft were still on course when they reached the coast, the pilots charged with finding DZ V would have seconds to do so. To improve their chances, the Allies expended a considerable effort on raising the standard of air navigation during the first half of 1944. The Pathfinder system was introduced to aid the location of landing areas at night.[15] But the task of improving aircrew proficiency was massively complicated by the immense scale of the Normandy operation. This necessitated an extremely rapid expansion of the air transport fleet and a sharp acceleration of aircrew training. The inevitable result was that many undertrained and inexperienced personnel were committed to battle on D-Day.[16] In the British case, the division of tasking between the various drop zones was such that it was necessary to assign the DZ V parachute drop to 46 Group, which had only been formed in March.[17] The majority of 46 Group aircrew

No 46 Gp having been formed as recently as March 1944, its crews were still relatively inexperienced on D-Day.

lacked the experience of their 38 Group counterparts, which included familiarity with the Normandy coast derived from Special Duties missions.[18]

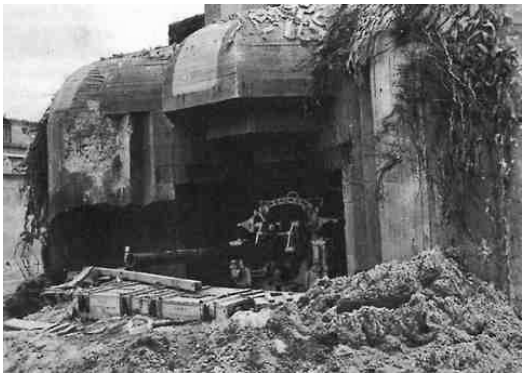
Then, finally, there was the weather issue. The Allied high command might ostensibly have accepted that the airborne lift was weather dependent, but Eisenhower's concerns lay elsewhere during the approach to D-Day. His ultimate decision to launch the operation was based overwhelmingly on maritime rather than air considerations.[19] The wind was too high for parachute drops, and visibility conditions over the American sector in Normandy were also unfavourable.[20]

The Normandy airborne operations achieved partial mission success, a higher proportion of objectives being secured in the British rather than the American sector because of the greater accuracy of the British airlift. The British achievement was capped by the outstandingly successful seizure of Pegasus Bridge, and the main airlift was sufficiently accurate to ensure the capture of the Ranville area and the prompt relief of the *coup-de-main* force. Yet this still left

Above – Pegasus Bridge with Horsas in the background and, left, the same Horsas.

the bridgehead far smaller than expected, and any hope of pushing the eastern flank out to the Dives had to be abandoned. This was partly because the original plans were probably too ambitious and partly because the Germans reacted more rapidly and in greater strength than the Allies expected, but a further significant reason is that the airlifts to the two outlying drop zones were very much less accurate than the Ranville lift.

In order to protect the security of the Pegasus Bridge operation, British airborne planners decided to reduce the time allotted to the pathfinders to the barest minimum – 30 minutes.[21] In the south, in the rush to set up their signals, one of the DZ K pathfinder teams failed to observe that they had mistakenly been dropped at DZ N (Ranville), and many paratroops destined for DZ K therefore landed in the Ranville area too. To the north, at DZ V, the only pathfinder equipment to survive the landings intact could not be recovered and set up before the main lift arrived. As they neared the coast, the 46 Group Dakotas drew AAA fire both from the invasion fleet and the Germans, which dispersed their formations; approaching from the



Silenced gun at the Merville Battery.

northeast, some crews mistook the Dives estuary at Cabourg for the Orne Estuary at Ouistreham, and crossed the coast too far east. Others, having arrived over the correct area, found the DZ partially obscured by smoke and dust from a bombing raid on the Merville Battery, and were unable to observe such pathfinder aids as were functioning.[22]

In no time at all, they were past the DZ. A number then turned back in search of their objective, flying across the main stream of troop carriers and adding to the confusion. The majority of paratroops dropped well wide of DZ V, and others were blown southeast by the strong northwest wind. There is still no agreement over the number of casualties incurred in the drop, but it is clear that there were significant losses in the flooded area.[23] Of 700 personnel originally assigned to the attack on the Merville Battery, only 150 could actually be assembled; this proved sufficient to capture the battery, but not to hold it. The supporting glider landings also failed, leaving the Merville operation to be executed without sappers or their specialised equipment.[24] In their absence, the guns could not be placed completely out of commission, and the Germans were able to repair them after they reoccupied the battery. Moreover, the Germans retained their hold on the coast between the Orne and the Dives for the remainder of the Normandy campaign. They only withdrew in the middle of August.[25]

Typically, if we think of the Normandy airborne missions at all, we tend to think of Pegasus Bridge and the wider Ranville area. And yet we must recognise that this represents only part of the airborne story. In the British sector, the landings at DZ K went badly wrong while the DZ V mission was a disastrous failure; in the American sector, the outcome of the airlift was similarly disappointing, with the result that many airborne objectives were not achieved, or were only secured

with the support of troops from the landing beaches. Casualties were inevitably high. Although the Allies had devoted extensive efforts to improving the accuracy of airborne lifts after Sicily, many of the failures of Operation HUSKY were, in fact, replicated in Normandy. Once again, the RAF and the USAAF sought to ensure that appropriate lessons were identified and exploited.

Yet if Normandy demonstrated once again the extreme difficulties involved in mounting accurate and concentrated airborne landings, it also offered a solution. Operation MALLARD, the British glider lift on the evening of D-Day, reached Normandy before nightfall and achieved a degree of accuracy far beyond anything previously witnessed by either the Allies or the Germans.[26] This, in turn, dramatically reduced the time involved in the assembly and deployment of 6 Air Landing Brigade. Up to this point, the Allied airborne forces had effectively been tied to night operations by their use in support of dawn amphibious landings, but the amphibious phase of OVERLORD had now been completed. Potentially, therefore, the airborne would have more freedom to choose whether they operated by night or day. The RAF retained the view that, given a sufficiently high level of training, accurate night operations might still be possible but, for the Americans, the arguments favouring daylight airlifts now appeared overwhelming, assuming the availability of supporting air power to provide fighter escorts and *Flak* suppression.[27]

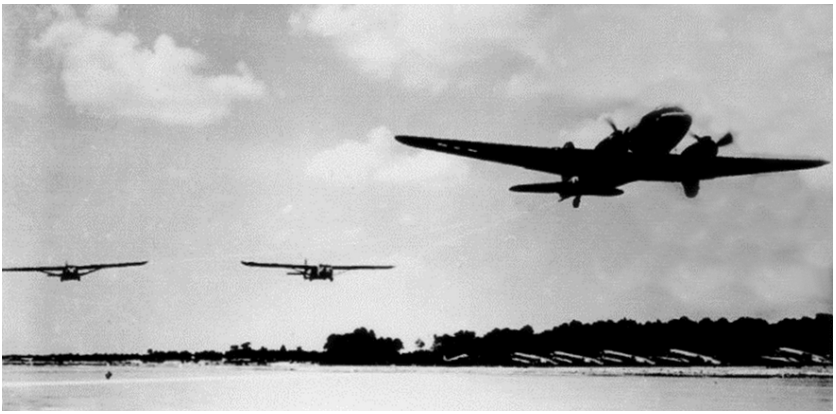
How, then, were the airborne to be used after D-Day? The British had held one of their two divisions, 1st Airborne, in reserve for follow-up missions. The basic idea was that they would be deployed at short notice to sustain the Allied ground advance through France and towards Germany. Potentially, Allied forces might be stalled by an enemy defensive line or major water obstacle. If so, vertical envelopment might provide a means to unhinge the German defences, allowing the advance to resume.[28] Broadly the same approach had been applied by the Allies in North Africa late in 1942. It had proved difficult then, with the major losers being the British 2nd Parachute Battalion, under its new Commanding Officer, Lt Col John Frost.[29] It would prove no easier in the summer of 1944.

One particular problem was that airborne operations took time to plan. Especially time-consuming was the loading plan – matching the available airlift to specific units and cargoes. To save time, 1st

Airborne Division constructed a standard loading plan that could be used in support of any operation on a one-size-fits-all basis. It could be described as 'lift plan heavy', based, as it was, on the entire division, including much of the divisional command and support infrastructure. It envisaged what was primarily a glider operation rather than a parachute landing and required around 600 assault gliders in total, whereas the RAF possessed fewer than 400 tugs.[30] Hence, two lifts would be required, and it would be essential to use troops from the first lift to defend the landing areas, pending the arrival of the second. Not one of 1st Airborne's three brigades would be conveyed in its entirety by the first lift.[31]

In the context of a short-distance cross-Channel operation against weak opposition, there might be no great objection to this approach. However, in a deeper operation, closer to the German heartland, it appears far more hazardous. Potentially, there would be a longer delay between the two lifts because of the greater distance involved, and enemy forces would have more time to react before the second lift arrived. The troops deployed by the first lift would be dangerously exposed. Arguably, 1st Airborne Division's loading plan was not sufficiently mission-focused. In an airborne operation, the mission is not to deploy a particular number of personnel, nor is it to hold drop zones. Rather, it is to capture such tactical or operational objectives as have been specified as quickly as possible. In conjunction with 'lift plan heavy', it would have made sense to develop 'lift plan light', based on brigades rather than the division. There was sufficient capacity for two complete brigades, and all their equipment, to be carried in a single lift. Unencumbered by the DZ defence task, both brigades so lifted could have been dispatched immediately to execute their primary missions.

Attempts to use the airborne in support of operations in Northern France came to nothing; throughout the summer, successive plans were proposed and then cancelled. During this period, the Allies sought to unify the airborne forces by creating First Allied Airborne Army, under the command of Lt Gen Lewis Brereton, comprising the British and American airborne divisions, RAF and USAAF troop carrier and glider forces, and other elements such as the Polish Parachute Brigade. It was agreed that, in future operations, the RAF would be used almost entirely for the British glider lift; US troop



Op LINNET would have involved double-tows for the US gliders.

carriers would convey the British parachute brigades as well as their own. In late August, after the breakout from Normandy, First Allied Airborne Army was allocated to the support of Montgomery's 21st Army Group. The first operation subsequently planned was named LINNET, and targeted the French/Belgian border not far from the Channel; LINNET would have involved all the forces that later participated in MARKET; it was an operation of mass rather than depth. The lift plan envisaged three daytime lifts: two large-scale lifts, with double-tow for the American gliders, would be mounted at dawn and late in the afternoon of the first day, while a third and smaller lift would be flown on the morning of the second day. All three lifts would be completed in around 24 hours from H-Hour – the time at which the first airborne troops were actually landed.[32]

LINNET was delayed by the weather and then cancelled, after Allied ground troops overran the drop zones. Airborne planning then shifted to the first operation to target Arnhem and Nijmegen, Operation COMET, drawn up early in September. The plan involved only 1st Airborne Division and the Poles – depth but not mass. Their tasking extended across a huge area, immediately adjacent to the German frontier, and encompassed a multiplicity of tactical objectives. It is highly unlikely that COMET would have succeeded. Two daylight airlifts were to be flown at either end of the day.[33] This was problematic, to say the least, as the objectives lay so far inside

German-occupied Holland. Having reached the Dutch coast, the Allied transport aircraft would have to transit across 90 miles of enemy-held territory, where there was abundant AAA and a functional radar-based integrated air defence system. By contrast, Allied radar coverage did not extend to Arnhem and Nijmegen. So it was arranged that the transport formations would have the support of escort fighters in considerable numbers; there would also be barrier patrols, and extensive counter-*Flak* operations were planned by both the RAF and USAAF.[34]

Evasive routing was another essential feature of the airlift, to guide the vulnerable troop carriers, tugs and gliders around known *Flak* concentrations and away from roads where mobile *Flak* might have been deployed. The route selected was somewhat to the south of Arnhem, and required a sharp northeast turn after 's-Hertogenbosch.[35] However, from this point, a final approach towards central Arnhem would have passed directly over the *Flak* defences of both Nijmegen and Arnhem itself.[36] The Allied transport aircraft would have been flying low and slow, straight and level. In the face of *Flak*, there was the potential for very heavy losses. This factor provided part of the basis for the RAF's contention that the drop zones and landing zones should be located outside Arnhem, but *Flak* was not the only consideration in this respect. It also transpired that the apparently open country south of the town was in fact poorly suited to large-scale glider landings, being typical Dutch polder land intersected by hundreds of drainage ditches. After the innumerable difficulties encountered in Normandy and Sicily, it was impossible to contemplate a major glider landing in such extensively subdivided country.[37]

The arguments against landing near the Arnhem road bridge were accepted by Lt Gen F A M 'Boy' Browning (Deputy Allied Airborne Commander and British Airborne Corps Commander) and the closest possible alternative was chosen, near Wolfheze, seven miles to the northwest.[38] The commander of 38 Group, AVM Leslie Hollinghurst, remained unhappy. He disagreed with the entire concept of staging an airborne operation against such deep objectives in broad daylight and retained his belief that high casualties were likely. Leigh-Mallory nevertheless decided that the operation should proceed.[39]

COMET was, like LINNET, delayed by the weather and then cancelled. It was cancelled due to intelligence that 2 SS Panzer Corps

Appointed as GOC 1st Airborne Division in 1941, Maj (later Lt) Gen F A M 'Boy' Browning became the leading figure on airborne matters within the British Army, but in 1944 he had never actually led airborne troops into battle and his grasp of the air dimension was limited in the extreme.

(9 and 10 SS Panzer Division) had been sent to the Arnhem area to rest and refit. On the morning of 10 September, Montgomery met Browning and Lt Gen Sir Miles Dempsey, commander of Second (British) Army, to discuss the future of the plan.[40] Quite apart from the threat now posed by the two SS Panzer Divisions, Browning and Dempsey were well aware of the drop zone problem at Arnhem by this time, and it is very likely that Montgomery was too.[41] The solution, potentially, was to switch the operation to another Rhine crossing point, but Montgomery was determined to retain Arnhem as the objective.[42]

So Browning proposed the merger of LINNET and COMET, using the three divisions assigned to LINNET and the LINNET airlift plan, but the COMET objectives – mass and depth combined.[43] Montgomery enthusiastically embraced the scheme and secured Eisenhower's approval later the same day. At this stage, there was no consultation with any of the other major stakeholders at Airborne Headquarters in England. Lt Gen Brereton, the American airborne divisions and the Allied air forces all remained blissfully ignorant of the events that were unfolding in Belgium. They only found out when Browning returned to the UK, revealed the enlarged Arnhem plan, and announced that it had already received Eisenhower's authorisation.[44]

The airborne part of plan was soon to be named MARKET, although it is better known by the combined airborne and land operation name MARKET GARDEN. It quickly began to unravel. Consider the basic concept. MARKET relied on the RAF and the USAAF to fly 35,000 troops and huge quantities of equipment around 300 miles, across different command, communication and weather

zones, deep into enemy-occupied territory and right up to the German frontier. And yet, despite the plan's critical dependence on the two air forces, neither had been approached in order to establish whether, in fact, the LINNET airlift could be recycled in the manner that Browning envisaged. Unfortunately, the three senior Army officers simply did not understand how the combination of mass and depth would impact on the plan. Arnhem and Nijmegen were just too far from the UK for such a massive multiple-lift operation to be viable; the Germans would be left with ample time to mobilise before the airborne build-up was completed.

The basic problem became clear at the very first planning meeting held at Airborne Headquarters after Browning's return to Britain. It was at this meeting that the USAAF troop carrier commander, Maj Gen Paul Williams, pointed out that, given the extra range involved, it would be impossible to double-tow the American gliders – a technique central to the tight LINNET timetable.[45] The American glider deployment rate would therefore be halved.[46] Worse was to follow. Soon after the meeting broke up, Williams' staff concluded that their troop carrier force could not mount two lifts in one day at full strength within the hours of daylight, as the LINNET plan had proposed. This was again because of the greater distance involved, and hence the increased transit time and the reduced turn-around time in the UK; moreover, fewer daylight hours would be available by mid-September, compared with late August, when LINNET was devised.[47]

They also feared that the proposed dawn take-off schedule would leave the operation vulnerable to weather disruption, a problem that had already contributed to the cancellation of LINNET and COMET. Consequently, instead of reducing the scale of the second lift to proportions that could be managed within the LINNET timetable (but potentially drawing out the airlift across several more smaller lifts), they proposed mounting one full strength lift per day in the middle hours of the day, when weather and visibility were likely to be most favourable. As planned, this would extend the airlift timetable from the H plus 24 hours envisaged for LINNET to H plus 46 hours.[48]

Hollinghurst was confident of the RAF's ability to execute two lifts at either end of the operation's first day – 17 September – but Williams insisted on the single lift plan. Events would prove him correct on weather grounds alone, as foggy conditions would have

prevented a dawn take-off by 38 Group and 46 Group on the 17th.[49] But two lifts that day would have made little difference in any case. The fundamental problem was simply that the operational objectives were too deep, given the scale of airborne lift requirements and the number of aircraft available. It was for this reason that, earlier that month, Brereton had recommended deploying First Allied Airborne Army to the Continent before attempting an operation so far to the east, but there was no opportunity to implement this eminently sensible recommendation before MARKET was approved.[50]

Despite this, the airlift timetable has since become the subject of much criticism, but the greatest controversy where the Arnhem air plan is concerned surrounds the location of the landing areas. It was soon agreed that 1st Airborne would use basically the same DZs and LZs that had been selected for Operation COMET, suitably enlarged. There was no alternative. Indeed, if anything, the arguments for landing at Wolfheze were now stronger. Allied intelligence, both Army and RAF, was reporting a considerable build-up of *Flak* around Arnhem, and there were concerns that this was not mere coincidence.[51] Potentially, via some breach of operational security, it seemed possible that the Germans had got wind of the Allied plan, and that *Flak* defences were being augmented specifically to counter the impending airborne assault.[52] Furthermore, whereas COMET had divided 1st Airborne's 600 gliders between Arnhem and Nijmegen, the entire lift would now target Arnhem, accentuating the need for large, open landing areas. Only the larger fields immediately west of Wolfheze satisfied this critical requirement, and only then by a narrow margin.[53]

Nevertheless, the fact remained that this plan, combined with the extended airlift timetable and 1st Airborne Division's pre-arranged loading scheme, would tie the British airborne to an extended DZ/LZ defence task at a location miles away from their key objective – the Arnhem road bridge. Around half the troops brought into Arnhem by the first lift would be used to hold the landing area. Out of five and a half battalions (and numerous divisional elements) brought into Arnhem on 17 September, only two would actually be sent to the bridge.[54]

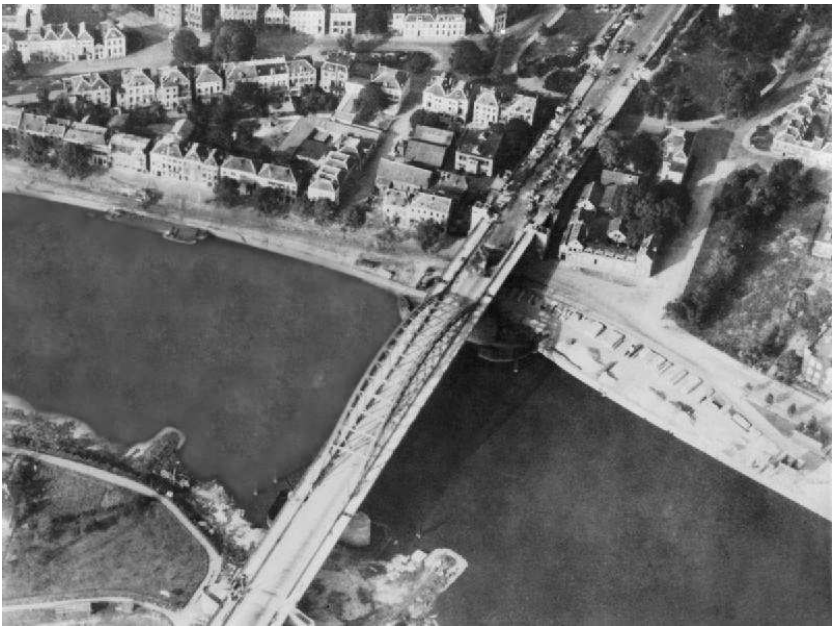
How successful was the air plan? On MARKET's first day, the RAF and USAAF between them prevented any interference by the

Luftwaffe, and the combination of evasive routing and *Flak* suppression kept aircraft losses to the absolute minimum. The airlift staged on 17 September was the most successful airborne deployment to be mounted by the Allies in the Second World War. The airborne were delivered with unprecedented accuracy to their DZs and LZs. The daytime lift allowed for more compressed landings and, for the airborne troops, assembly and unloading, at full strength, in a fraction of the time required in Normandy on the night of 5/6 June. Although slightly delayed and subjected to more enemy interference, the second lift was also very successful. Thereafter, the weather turned decisively against the Allies, causing the third lift to be spread out over several days and impacting adversely upon air operations in a variety of other ways, too, but the weather would also have interfered with any notional alternative airlift timetable. The MARKET schedule did at least provide for the first two lifts to be completed broadly according to plan.[55]

The success of the first two MARKET lifts is worth stressing, as its true significance is ignored in virtually all histories of the operation. Control of the air allowed the Allies to stage the airlifts in daylight; the daylight lifts ensured accuracy; accuracy, more than anything else, led to the rapid and complete assembly of airborne troops and equipment on the ground. This, in turn, allowed the majority of airborne units to secure their tactical objectives; the proportion of airborne tactical objectives captured was significantly higher than in Normandy.[56] It was primarily for this reason that MARKET came so close to success. The problem was that the plan required all airborne tactical objectives to be captured; even a very limited degree of mission failure could jeopardise the entire undertaking.

In no previous large-scale airborne operation had 100 per cent tactical mission success been achieved – or anything like it. Why should Allied commanders like Montgomery and Browning have believed that such a feat might now be possible? The basic fact is that they vastly underestimated the speed and scale of the German response to the initial airborne landings. As we have noted, Allied intelligence had located 2 SS Panzer Corps in the Arnhem area early in September 1944, but its component divisions were known to have suffered heavy losses in Normandy and during the subsequent retreat;

The landing ground at Arnhem



The Arnhem bridge photographed on 19 September.

they had very few tanks, and it seemed unlikely that they would present a significant threat once Operation COMET was enlarged into MARKET. Of 2 SS Panzer Corps, Montgomery later wrote: 'We knew it was there. But we were wrong in supposing that it could not fight effectively. Its battle state was far beyond our expectations.'[57] In other respects, too, Allied intelligence assessments proved too optimistic. Following the initial landings on 17 September, the Germans succeeded in mobilising many more troops than expected in the key Arnhem and Nijmegen sectors, with remarkable speed. Organised into *ad hoc* battle-groups, they were rapidly deployed against the airborne, giving the Germans a numerical advantage that fatally undermined some of the most elementary assumptions underpinning the MARKET concept.[58]

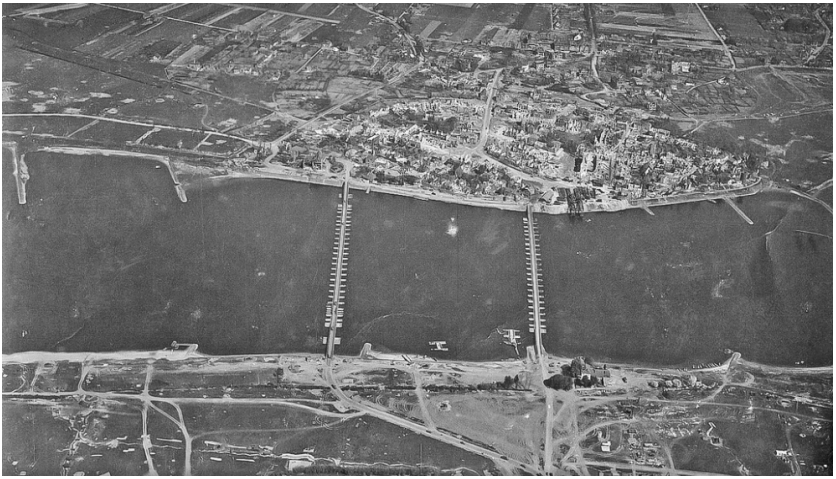
From 19 September, the main effort of both 38 Group and 46 Group was switched to resupply at Arnhem. The location of the resupply drop zones reflected the expectation that 1st Airborne Division would take up positions not only at the road bridge but also

on a long perimeter line all around Northern Arnhem, before major German counter-attacks began. Instead, the drop zones were soon largely overrun and ringed with *Flak*; British resupply plans and ground-to-air signals equipment quickly fell into German hands. The results are well known. The majority of the 55 aircraft lost by 38 Group and 46 Group during MARKET fell victim to *Flak* on resupply missions, including the Dakota flown by Flt Lt David Lord, who was posthumously awarded a Victoria Cross. Not a single aircraft from the two groups emerged from the operation entirely unscathed. Most of the supplies fell straight into German hands, or landed in areas that were beyond the reach of 1st Airborne.[59]

The worst day of all was 21 September, when a supply mission was launched without escort fighters, which had been grounded by the weather, and the transports were intercepted by the *Luftwaffe*. In total, 23 aircraft were shot down and 61 more sustained damage.[60] Out of ten aircraft dispatched by No 190 Sqn, only three returned. By this time, the justification for continuing these futile missions was being challenged, and there was no resupply on the 22nd, ostensibly because of the weather. The last mission of any scale was flown on the 23rd; again, only a tiny fraction of the supplies actually reached 1st Airborne Division.[61]

Most of the major lessons identified after MARKET's failure were meticulously applied by the Allies during the preparations for Operation VARSITY, the following March. The single, cardinal failure in MARKET lay in the area of command and control. It should never have been possible for Montgomery, Dempsey and Browning to devise the operation in isolation and secure Eisenhower's approval for their plans without consulting the other key stakeholders within First Allied Airborne Army. Montgomery had little knowledge or understanding of airborne operations, and was totally dependent on Browning for advice; and yet Browning had never actually led airborne troops into battle and his grasp of the air dimension was limited in the extreme. He was, after all, a Guardsman, with absolutely no professional expertise in air matters. In VARSITY, by contrast, command and control was more effectively integrated, with senior land, airborne and air commanders being intimately involved in the planning process from the very beginning.[62]

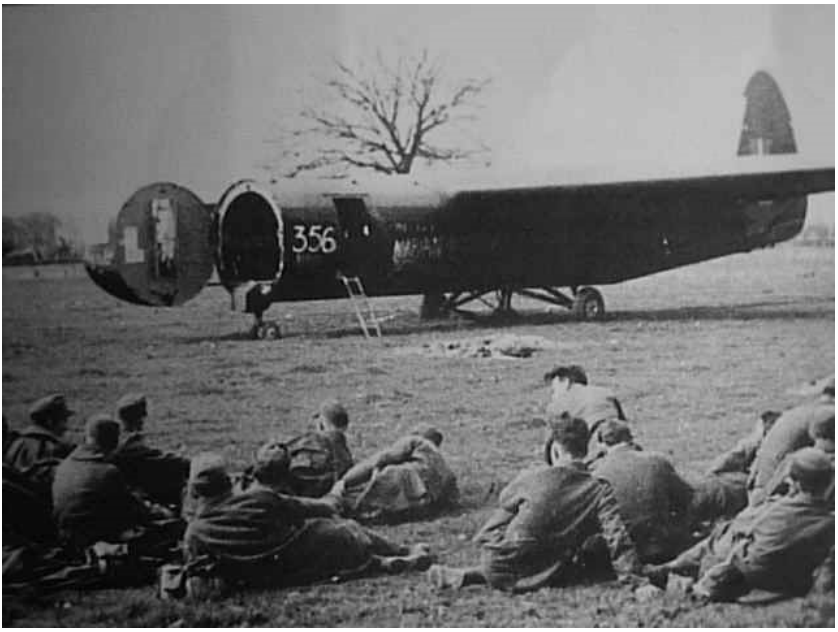
Whereas MARKET GARDEN had been scrambled together at



Pontoon bridges over the Rhine at Rees.

exceptionally short notice, a lead time of several months provided ample scope for most aspects of the VARSITY plan to be subjected to detailed scrutiny and deliberation.[63] The airborne plan was far less ambitious than the Arnhem plan: the objectives lay only a short distance across the Rhine, and the landings were not, in any case, scheduled to commence until the first river crossings had been successfully completed by British ground forces – Dempsey's Second Army – under the auspices of Operation PLUNDER.[64] Finally, a highly detailed intelligence assessment of the strength and dispositions of German forces in the area was prepared before the operation was launched.[65]

Beyond this, the difference between the challenge that confronted the RAF at Arnhem and the task they faced in VARSITY could hardly have been more pronounced. Although the bulk of the US 9th Troop Carrier Command deployed into France for VARSITY, 38 Group and 46 Group remained in the UK, but they were moved to airfields in East Anglia to reduce distance and transit time to the minimum. Their routing followed the shortest possible course across the channel, and virtually the entire flight took place within friendly skies. They had only to make the briefest of incursions into hostile airspace before releasing their gliders into a largely rural area of Germany and turning for home. The main problem facing the Allied air forces lay in



Operation VARSITY: Chalk 356, LZ 'P', one of thirty B Sqn Horsas allocated to the 53rd (Worcestershire Yeomanry) Light Regiment, Royal Artillery with what appear to be German prisoners in the foreground.

implementing one of the other key lessons of MARKET, namely that airborne operations should be mounted via a single airlift. Primarily, this meant reducing the demands of the airborne divisions to sensible levels, but some enlargement of the air transport fleet was also necessary, at a time when aircraft and manpower resources were being stretched to the limit.[66] Ultimately, the two RAF groups were raised to a combined total of 440 aircraft – about 60 more than they had possessed at Arnhem.[67]

How successful was the RAF mission in Operation VARSITY? Some 35 gliders did not reach the release point due mainly to slipstream problems and broken tow-ropes – familiar hazards in longer-distance operations. Others were released at too high an altitude, their tugs having been forced higher up for flight safety reasons in the congested airspace over the Rhine; this certainly

Operation HUSKY highlighted the need to avoid obscuring LGs with smoke, but it happened again at the Rhine crossing.

complicated the landing task. But the vast majority of gliders were cast off at the correct location and altitude.[68] The landings nevertheless went badly wrong; indeed, they were something of a failure by comparison with the main British glider missions in Normandy and Holland. In seeking to exploit the lessons of Arnhem, the Allies neglected the lessons identified after Sicily and repeated the mistake made in the Merville Battery assault in Normandy: they subordinated all other considerations to the requirement for landing areas that were close to the objective.[69] Moreover, before VARSITY was launched, there was insufficiently detailed consultation between First Allied Airborne Army and Second Army. Consequently, between them, they failed to spot one aspect of the Second Army Rhine crossing plan that very obviously had the potential to jeopardise the success of the airborne operation.

To shield their preparations for the river crossing from German eyes, Second Army generated possibly the largest smoke screen in history; it was maintained for no fewer than nine days over a front of more than 50 miles. One airborne lesson recorded after Operation HUSKY had been that DZs and LZs should be sited to ensure that they were not obscured by smoke or fires on the ground,[70] but this eminently sensible recommendation had apparently been forgotten by March 1945. Had the airborne operation been commanded by a British officer such as Browning, who had worked closely with Second Army in the past, the smoke screen might possibly have been identified as a hazard.[71] But Browning had been removed from his post after MARKET, leaving VARSITY to be commanded by an American, Lieutenant General Matthew Ridgeway.[72] It may be that Ridgeway did not maintain a comparable working relationship with Second Army's senior staff.

Even then, the consequences might not have been quite so serious without another factor – an unfortunate intervention by the commander of the Glider Pilot Regiment, Brig George Chatterton. Chatterton was a key personality within the Allied airborne community and had played a vital role in the creation and expansion of the British assault glider force. Of particular note was his role in training the aircrew who so brilliantly executed the Pegasus Bridge landing on D-Day.[73] But, in VARSITY, Chatterton made a fundamental mistake. He concocted a plan for landing 6th Airborne Division's gliders in relatively small tactical groups immediately adjacent to the objectives of the personnel they were carrying.[74] This was completely at odds with past experience, which had demonstrated the advantages in terms of air navigation that accrued from the use of a small number of large and easily visible LZs.[75]

Chatterton's scheme would have taxed the aircrew who landed so successfully in Normandy and at Arnhem, but much of the Glider Pilot Regiment had not returned from Arnhem. Therefore, at minimal notice, it had had to be reconstituted using such manpower resources as were available – chiefly aircrew from the RAF reserve pool. These new recruits were then given the standard glider pilot refresher course (having never received the basic training) and some rudimentary infantry instruction.[76] With such obviously 'green' pilots making up a high proportion of his force, Chatterton should have observed that most elementary planning principle – keep it simple. Instead, he needlessly complicated an already very difficult task.

During the final approach to the Rhine, visibility remained at least adequate for the gliders and their tugs. But the country to the east of the river, where the release point and the LZs were located, was substantially obscured by Second Army's smoke screen, and by smoke and dust generated by the 4,000-gun artillery barrage and the ongoing battle.[77] After cast-off, descending through the dense smoke, the pilots circled and tried to pick out their assigned landing points, only to be confronted by a murderous hail of anti-aircraft and small-arms fire from the Germans. In no time, the tactical plan disintegrated, leaving the British glider force to be dispersed over a large area. Many gliders fell victim to the German gunners or crash-landed, and others were raked with fire as soon as they touched down.[78]

The majority of glider-borne cargoes were destroyed or damaged

or could not be recovered and deployed in battle, and 27 per cent of the glider pilots became casualties. The casualty rate sustained by 6 Air Landing Brigade in Operation VARSITY totalled approximately 40 per cent, most of the losses being incurred during the actual landings;[79] the 2nd Oxfordshire and Buckinghamshire Light Infantry lost half their strength in a period of about 20 minutes.[80] After a recovery effort extending over several days, the final equipment losses included 46 per cent of 6th Airborne Division's jeeps, 44 per cent of their trailers, 44 per cent of their carriers, half their light tanks, 29 per cent of their 75mm Howitzers, half their 25 pounders, 56 per cent of their 17 pounder anti-tank guns, 29 per cent of their 6 pounder anti-tank guns and 56 per cent of their Dodge 3/4 ton weapon carriers.[81]

Luckily, the operational implications were not especially grave. The British paratroops landed far more accurately and the glider landings, ironically enough, received invaluable support from the many American paratroops who were dropped in error on the British LZs.[82] Moreover, although the intensity of the anti-aircraft fire substantially exceeded Allied expectations, German resistance quickly collapsed on the ground. Hence, most airborne objectives were soon secured and the vital link-up with Second Army was achieved without difficulty. PLUNDER-VARSITY succeeded but it was, perhaps, something of a sledgehammer to crack a nut. There were obvious attempts in the subsequent after-action reports to play down the true extent of the British glider-landing debacle, and this exercise in sanitisation continues to colour historical assessments of Operation VARSITY to this day.[83]

Conclusions

The RAF's experience across the three airborne operations addressed in this paper was clearly very mixed. In Normandy, the successes of the Ranville mission and Operation MALLARD were marred by the disaster that occurred at DZ V. At Arnhem, the RAF made a vital contribution to the Allies' most successful airborne lift of the war, only to be confronted by a bitter and enduring critique of the air plan. In VARSITY, the RAF again fulfilled their mission very creditably, but the glider landings were ruined by a series of elementary tactical planning failures.

Why should this story have been so complex and convoluted? How

can the absence of more consistent development and advance, from one operation to the next, be explained? The initial problem lay with the post-HUSKY airborne lessons studies. They correctly identified many vital lessons, but without questioning the basic concept of using airborne troops to support dawn amphibious landings. Yet many of the problems that arose during HUSKY actually stemmed from this concept. It was thus hardly surprising that identical difficulties should have been encountered in Normandy, given the obvious similarity between the two operations. Thereafter, the airborne concept was changed. However, in seeking to implement the revised approach, Montgomery and Browning largely ignored earlier lessons, which had, among other things, emphasised the need for ample lead time, for integrated command and control and for prompt relief of the airborne troops by ground forces. Moreover, their plan imposed particularly narrow and exacting constraints upon those subsequently responsible for planning at the tactical level.

Without prior consultation, the air forces were tasked with a lift that combined unprecedented scale and depth with a protracted daylight transit through hostile airspace to objectives only just short of the German border. Historians have tended to argue that there were several ways in which they might have discharged this formidable undertaking, ignoring or misrepresenting key planning considerations, as well as the steadfast determination of both the RAF and the USAAF to avoid the mistakes of Sicily and Normandy. In truth, in the prevailing circumstances, there was no viable alternative to the approach that the Allied airmen adopted – an approach that finally yielded the accurate and concentrated landings that had eluded them in the past, substantially increasing the scope for the airborne forces to fulfil their missions.

Nevertheless, this achievement was overshadowed by the fact that, ultimately, MARKET failed. Its aftermath duly witnessed another search for lessons, which correctly identified many features of the plan that might, ideally, have been different, but failed to capture the context within which some of the original planning decisions were taken. Particularly notable in this respect was the verdict that the Arnhem landing areas were too far from the road bridge. Superficially, the case might have appeared valid, but it was not accompanied by any careful consideration of the factors that led to the selection of the

Wolfheze DZs and LZs – the intelligence on German *Flak* and the requirement for large, firm and open fields capable of accommodating 600 assault gliders – and it did not identify any viable alternatives.

And so, when Operation VARSITY was planned, the need for landings close to the airborne objectives came to overshadow almost every other factor. Consequently, on 24 March 1945, British forces mounted their largest single glider landing of the war into LZs that were shrouded in thick Allied-generated smoke and well protected by German anti-aircraft defences; moreover, this daunting assignment depended predominantly for its success upon novice aircrew, who had received nothing more than a glider pilot's refresher course before becoming guinea pigs in Chatterton's doomed tactical landing experiment. The MARKET baby – the successful airlift – was ejected with the bath water, and the overriding importance subsequently attached to tactical requirements on the ground effectively placed the airborne cart in front of the air force horse. It was for this reason that the RAF's final large-scale airborne lift of the Second World War ended in another shambolic glider landing.

Notes

[1] Where Arnhem is concerned, this basic failure is common to Martin Middlebrook, *Arnhem 1944: The Airborne Battle, 17-26 September* (Penguin, London, 1995), Cornelius Ryan, *A Bridge Too Far* (Wordsworth Editions, Ware, 1999), Peter Harclerode, *Arnhem: A Tragedy of Errors* (Caxton Editions, London, 2000) and A D Harvey, *Arnhem* (Cassell, London, 2001), to name but a few. William Buckingham, *Arnhem 1944* (Tempus, Stroud, 2004), considers earlier operations involving 1st Airborne Division but otherwise also avoids comparing or contrasting MARKET with previous airborne ventures.

[2] Lloyd Clark, *Arnhem: Jumping the Rhine 1944 and 1945* (Headline Review, London, 2009), pp281-282.

[3] Air Publication (AP) 3231, *The Second World War 1939-1945, Royal Air Force, Airborne Forces* (Air Ministry official monograph, 1951), p48.

[4] 38 Wing RAF Report on Training and Operations in North Africa and Sicily, May/July 1943 (held at Air Historical Branch – AHB); John C Warren, *Airborne Missions in the Mediterranean 1942-1945* (United States Air Force Historical Division Research Studies Institute, Air University, 1955), pp33-52; AP 3231, *Airborne Forces*, p90; Lt Col T B H Otway, *Airborne Forces* (War Office official monograph, 1951), pp120-127; Maurice Tugwell, *Airborne to Battle: A History of Airborne Warfare* (William Kimber, London, 1971), pp164-166.

[5] These papers included Joint War Office/Air Ministry Report on the Employment of Airborne Forces; US War Department Training Circular 113, 9 October 1943; un-numbered SHAEF memorandum dated 19 January 1944; and Combined Chiefs of

Staff Paper 496. Copies of all can be found in Notes on the Planning and Preparation of the Allied Expeditionary Air Force for the Invasion of North West France in June 1944, Appendices (held at AHB). See also US Army Air Forces Board Project (T) 27, Long Range Study of Airborne Operations, 29 April 1944 (held at AHB).

[6] Extract from Joint War Office/Air Ministry Report on the Employment of Airborne Forces, Part A, Lessons of Airborne Operations in Sicily, 27 November 1943, Notes on the Planning and Preparation of the Allied Expeditionary Air Force for the Invasion of North West France in June 1944, Appendices.

[7] *Ibid*.

[8] John C Warren, *Airborne Operations in World War II, European Theatre* (United States Air Force Historical Division, Research Studies Institute, Air University, 1956), pp3, 6-9; AP 3231, *Airborne Forces*, p118.

[9] Memorandum on the Employment of Airborne Forces in Operation OVERLORD, April 1944, Appendix V/8; notes of a conference held at SHAEF, 27 May 1944, Appendix V/45, Notes on the Planning and Preparation of the Allied Expeditionary Air Force for the Invasion of North West France in June 1944, Appendices.

[10] Stephen Ambrose, *Pegasus Bridge, D-Day: The Daring British Airborne Raid* (Pocket Books, London, 2003), pp57-59.

[11] TNA AIR 38/238, an Account of the Organisation, Training and Operations (and Lessons Learned) of 46 (Transport Support) Group, Royal Air Force, during the Invasion of Hitler's Europe, prepared by Headquarters 46 Group.

[12] The burden of identification was placed squarely upon the aircrew rather than the naval crew, effectively compelling the aircraft to route around naval forces at night: see COSSAC/2297/4/Ops, December 1943, Employment of Airborne Forces, Appendix V/24, Notes on the Planning and Preparation of the Allied Expeditionary Air Force for the Invasion of North West France in June 1944, Appendices.

[13] For a map of the routing see AP 3231, *Airborne Forces*, p119.

[14] On the difficulties of this routing, see TNA AIR 37/464, Wing Commander, Airborne Ops, to D/Chief of Ops, 20 April 1944.

[15] AP 3231, *Airborne Forces*, pp96-97; Warren, *Airborne Operations*, p4; Otway, *Airborne Forces*, p131.

[16] Warren, *Airborne Operations*, pp7-9, 18-20, 23, 24; Notes on the Planning and Preparation of the Allied Expeditionary Air Force for the Invasion of North West France in June 1944, by PS to Air C-in-C, AEAF (held at AHB), p310.

[17] AP 3231, *Airborne Forces*, p108.

[18] TNA AIR 37/464, Wg Cdr D Cattell to Chief of Ops, 1 May 1944.

[19] Carlo D'Este, *Decision in Normandy* (Penguin, London, 2001), pp109-110.

[20] The wind was gusting at up to 30 mph; see AP 3231, *Airborne* Forces, p125.

[21] TNA AIR 37/772, AOC 38 Group to AOC 46 Group, 7 July 1944; Otway, *Airborne Forces*, p200.

[22] AP 3231, *Airborne Forces*, pp125-128.

[23] Subsequent correspondence includes TNA AIR 37/286, Wg Cdr B A Coventry to OC RAF Broadwell, 18 June 1944; AOC 38 Group to Gp Capt J Bradbury, 24 June 1944; TNA AIR 37/772, AOC 38 Group to Gp Capt R L Crofton, 24 June 1944.

[24] Lloyd Clark, *Orne Bridgehead* (Sutton, Stroud, 2004), pp56-58.

[25] Air Historical Branch, *The Liberation of North West Europe Vol. 4, The Breakout and the Advance to the Lower Rhine, 12 June to 30 September 1944* (unpublished official narrative, first draft), p10; the position of the front line is most vividly illustrated in consecutive maps in John Man, *The Penguin Atlas of D-Day and the Normandy Campaign* (Viking, London, 1994).
[26] AP 3231, *Airborne* Forces, p134.
[27] Warren, *Airborne Operations*, p61.
[28] AP 3231, *Airborne Forces*, p146; Extract from Joint War Office/Air Ministry Report on the Employment of Airborne Forces, Part B, Recommendations for Future Employment of Airborne Forces, Notes on the Planning and Preparation of the Allied Expeditionary Air Force for the Invasion of North West France in June 1944, Appendices.
[29] Otway, *Airborne Forces*, pp78-81; Major-General John Frost, *A Drop Too Many* (Cassell, London, 1980), pp74-100.
[30] TNA AIR 37/413 Browning to HQ 38 Group RAF, 22 May 44.
[31] Maj-Gen R E Urquhart, *Arnhem* (Pan, London, 1972), p217. Although it is widely supposed that the entirety of 1 Parachute Brigade arrived at Arnhem on MARKET GARDEN's first day, 20 gliders were in fact allocated to the brigade in the second lift.
[32] TNA AIR 37/509, No 11 Group Operation Instruction No 39/1944, 2 September 1944; memorandum entitled 'Air Support, Operation LINNET', Appendix B, 30 August 1944.
[33] TNA AIR 37/979, 38 Group Operation Order 524, 'COMET', 6 September 1944.
[34] *Ibid*.
[35] *Ibid*.
[36] For relevant mapping, see TNA AIR 37/1214, Appendix D, Headquarters Troop Carrier Command Intelligence Trace No. 4 for Operation MARKET; the equivalent map for Operation COMET is contained in TNA WO 205/850.
[37] TNA AIR 37/1214, Allied Airborne Operations in Holland, September-October 1944; Hollinghurst papers, RAF Museum, AC 73/23/49, comments on AHB monograph on the history of the airborne forces, p2; For the relevant terrain intelligence reports, see TNA WO 171/393, 1st Airborne Division War Diary, September 1944.
[38] TNA CAB 44/253, p69.
[39] TNA AIR 37/775, Hollinghurst to Leigh-Mallory, 6 September 1944.
[40] TNA WO 285/9, Dempsey diary, 10 September 1944.
[41] TNA CAB 44/253, p69.
[42] TNA WO 285/9, Dempsey diary, 10 September 1944.
[43] *Ibid*.
[44] First Allied Airborne Army, Operations in Holland, September-November 1944, 16 December 1944 (held at AHB).
[45] TNA WO 219/4998, minutes of a meeting called by Commanding General, First Allied Airborne Army, 10 September 1944.
[46] TNA AIR 37/509, No 11 Group Operation Instruction No 39/1944, 2 September 1944; Warren, *Airborne Operations*, pp89, 226.

[47] TNA WO 219/4998, memorandum by Lt Col Thomas Bartley, 10 September 1944.
[48] *Ibid*.
[49] Stan Cornford and Sqn Ldr Peter Davies, 'Arnhem: The Weather,' *Air Clues*, Vol. 48, No. 10 (October 1994), p396; TNA AIR 37/13, An Account of the Organisation, Training and Operations (and Lessons Learned) of 46 (Transport Support) Group, Royal Air Force, during the Invasion of Hitler's Europe, p70.
[50] TNA WO 219/2186, Brereton to Eisenhower, 1 September 1944; TNA WO 219/2121, memorandum by SHAEF planning staff, 4 September 1944. This memorandum set out the basic arguments Brereton submitted to Eisenhower on 1 September.
[51] TNA WO 171/341, XXX Corps intelligence summary 494, 7 September 1944; TNA AIR 37/1217, Operation MARKET, 1st Airborne Division Planning Intelligence Summary No. 2, 14 September 1944, prepared by G2 (I); see also TNA AIR 37/1214, Appendix D, Headquarters Troop Carrier Command Intelligence Trace No. 4 for Operation MARKET.
[52] TNA AIR 37/1217, Operation MARKET, 1st Airborne Division Planning Intelligence Summary No 2 dated 14 September 1944, prepared by G2 (I).
[53] Report on the British Airborne Effort in Operation MARKET, by 38 and 46 Groups, RAF, 1 January 1945 (held at AHB).
[54] The three battalions of 1 Parachute Brigade left the landing area, 2 and 3 Para having been assigned to the bridge, while 1 Para was to occupy positions in northern Arnhem. All the Air-Landing Brigade elements conveyed by the first lift remained in the DZ/LZ area, together with all Glider Pilot Regiment personnel, who were trained to fight as infantry.
[55] For the best account of the airlifts, covering the whole operation, see Warren, *Airborne Operations*, Chapter 4. On the compression of the airlift, relative to the Normandy lifts, see p90.
[56] Out of the multiplicity of crossings, only the bridges at Son and Nijmegen were not secured. By contrast, the British airborne lodgement area in Normandy was far smaller than originally planned. Of the various American missions, only one of the four causeways from Utah Beach was captured outright by 101st Airborne and they also failed to establish a firm northern perimeter line linking with 82nd Airborne, or to seal off the southern flank of the Utah beachhead. Similarly, 82nd Airborne failed to establish adequate protection on their northern flank and were unable to capture the La Fière, Chef-du-Pont and Pont l'Abbé bridges. Much of the British and American airborne achievement was dependent on assistance or reinforcement by conventional ground troops advancing inland from beaches, whereas, in MARKET, the airborne were predominantly unsupported.
[57] Montgomery, *Memoirs*, p297.
[58] *Airborne Operations: A German Appraisal*, Office of the Chief of Military History, Department of the Army (US Army Foreign Military Studies Series, 1950), pp54-55; Kershaw, *It Never Snows in September* (Ian Allen, Hersham, 2004), pp108-112, 119-120.
[59] Warren, *Airborne Operations*, p132.

[60] *Ibid*; pp133-144.
[61] Arie-Jan Van Hees, *Green On! A Detailed Survey of the British Parachute Re-Supply Sorties During Operation Market Garden* (self-published, Eijsden, 2009), 18-25 September 1944, pp216-217.
[62] Warren, *Airborne Operations*, pp159-160.
[63] No 38 Group RAF Report on Operation VARSITY, 20 May 1945, para 110, (held at AHB).
[64] Warren, *Airborne Operations*, p161.
[65] *Ibid*; p167.
[66] *Ibid*; pp158, 161-163.
[67] AP 3231, *Airborne Forces*, pp184-185.
[68] *Ibid*; pp193, 197.
[69] No 38 Group RAF Report on Operation VARSITY, 20 May 1945, para 24-26.
[70] US War Department Training Circular No 113, 9 October 1943, Notes on the Planning and Preparation of the Allied Expeditionary Air Force for the Invasion of Northwest France, June 1944, Appendices.
[71] Smoke obscuration was specifically identified as a hazard to air navigation during the preparations for the Normandy landings; see TNA AIR 37/464, Wg Cdr D Cattell to Chief of Ops, 1 May 1944.
[72] Warren, *Airborne Operations*, p156.
[73] Ambrose, *Pegasus Bridge*, pp57-58.
[74] No 38 Group RAF Report on Operation VARSITY, 20 May 1945, para 24-26.
[75] The main British doctrinal pronouncement on the subject read: 'The dropping zone should be an easily recognisable area rather than a pin point chosen for tactical reasons'. See extract from Joint War Office/Air Ministry Report on the Employment of Airborne Forces, Part A, Lessons of Airborne Operations in Sicily, Notes on the Planning and Preparation of the Allied Expeditionary Air Force for the Invasion of North West France in June 1944, Appendices.
[76] AP 3231, *Airborne Forces*, p185.
[77] Warren, *Airborne Operations*, p174.
[78] Otway, *Airborne Forces*, p308.
[79] Howard N Cole, *On Wings of Healing: The Story of the Airborne Medical Services, 1940-1960* (William Blackwood, Edinburgh, 1963), p166.
[80] TNA WO 171/4320, 6 Air Landing Brigade Headquarters War Diary, 24 March 1944.
[81] Otway, *Airborne Forces*, pp318.
[82] Warren, *Airborne Operations*, p181.
[83] See, for example, No 38 Group RAF Report on Operation VARSITY, 20 May 1945, para 63. For a typically misleading account of the British glider landings, offering no comment at all on their inaccuracy or the materiel losses involved, see Lloyd Clark, *Arnhem: Jumping the Rhine*, pp314-316.

RAF REGIMENT PARACHUTE UNITS 1942-1950

Graeme Deeley

Graeme Deeley joined the Parachute Regiment in 1988 but due to training accidents transferred to the Intelligence Corps in 1992. After serving with 5 Airborne and 16 Air Assault Brigade, his last four years were spent at Honington as the Intelligence Warrant Officer of the Joint CBRN Regiment. He left the Army in 2012 and is currently an Intelligence Officer with the Wiltshire Police Human Trafficking Team. Graeme's father was a RAF Regt Warrant Officer and this led to the publication of his second book Never Not Ready, a History of RAF Regiment Parachute Units 1942-2012.

The formation of the first RAF tactical parachute unit resulted from the assessment of the Axis threat to Iraq by AVM Hugh de Crespigny MC DFC, who was appointed AOC Iraq in January 1942. He considered that the German line of advance would be through the Caucasus from Russia which, if successful, would threaten the security of the oilfields and the pipeline to Palestine. This advance would be through both desert and mountainous country which would be channelled by numerous road and rail bridges and tunnels. These vulnerable points would be ideal targets for parachute troops to destroy and thus slow the advance. By using native personnel it would be possible for them to blend into the local population after carrying out their tasks and they would be able to gain vital intelligence when making their way back to Allied lines. Prior to his move to Iraq the air vice-marshal had requested that Sqn Ldr Maurice Newnham, the CO of the Parachute Training School, brief him on the training and employment of parachute troops.

Upon arriving in Iraq, de Crespigny authorised the training of a company strength unit of the RAF Levies in the parachute role. No 1 Paratroop Company was formed in June 1942 at Habbaniya. The first two British officers attended a parachute course at the Parachute Training School (PTS) at Kabrit, Egypt followed by further training at the PTS in India. Both also qualified as Parachute Jumping Instructors and parachute packers. In preparation for the planned sabotage role,

A Valentia dropping a trainee parachutist in the Middle East.

the British CSM and an SNCO completed a guerrilla warfare course in Gaza. There was no PTS in Iraq so equipment had to be acquired by whatever means presented themselves. Noting that aircraft bound for India stopped over at Habbaniya, Wg Cdr Newnham on a visit to Iraq in 1943, formed the impression that equipment destined for the schools in Egypt and India had been acquired in 'mysterious circumstances'.

In order to ensure that the right kind of men applied for parachute training, no special privileges in terms of pay or promotion were offered. This did not deter approximately one thousand men from volunteering. The company comprised three Assyrian platoons and one Kurdish. The only aircraft available for parachute training were three old Vickers Valentias. These could carry up to twenty men and the roof was high enough for an average sized man to stand upright. A hole was cut in the floor though which the men could make their exits.

After the defeat of German forces at Stalingrad and their withdrawal from the Caucasus in February 1943 the threat to Iraq from the north was removed. Since the contingency for which the Para Coy had originally been formed no longer existed, it was offered to the GOC Middle East. In July 1943 the Coy was attached to the 11th Parachute Battalion of the 4th Parachute Brigade which was then completing its training in Syria. On 13 September 1943 the 11th Para Bn moved to Cyprus in preparation for an operation to capture the airfield on the island of Cos. Only the Bn HQ and A Coy jumped on the operation due to a shortage of aircraft and the remainder, including the Levies, were held in reserve. This is probably the first time an RAF parachute unit was ready to seize an airfield by parachute

Left: Sgt Benyamin Shlimon is said to have been the youngest soldier in the British Armed Forces; having joined the Iraq Levies at 14 years of age, he volunteered to become a parachutist a year later. Right: Sgts Dankho Yako and Awia Yacube; the latter was later commissioned, served with the Levies until they disbanded in 1955 and finally retired from the Iraqi Army, as a major, in 1972.

assault. Shortly after the airfield was taken, it was reinforced by British Forces including RAF Regiment light anti-aircraft (LAA) guns. However, the airfield was retaken by the Germans the following month in a combined airborne and sea assault.

On 17 December 1943 the Coy was detached from the 11th Para Bn, which moved to England, and early in 1944 it returned to Habbaniya. In August 1944 the Coy was deployed to Italy, initially under RAF Regiment Command but on 6 October they joined 2 Commando Brigade under command of Brigadier T Churchill, for an assault on the town of Sarande in Albania. No 40 Royal Marine Commando was to assault the port; No 2 Army Commando was to attack a German battery on a hill to the north east of the town and Partisans would cut the road into Sarande from the east. The Levies were ordered to take Monastery Hill, Point 264, the high ground overlooking the town from the South East, by landing on a beach, codenamed Parachute Beach, and assaulting the hill from the enemy's rear. The attack was scheduled to commence at 0430 hrs preceded by a 30 minute bombardment by the Royal Navy.

At 0130 hrs on 9 October the Levies paraded alongside six

Landing Craft Infantry (LCI) and were issued with their rum ration before sailing. Two and a half hours later they landed, undetected at Parachute Beach. The Coy OC, Major Hudson, reported that the Germans were in well-constructed defensive positions with plenty of medium and light machine guns, small mortars and large supplies of ammunition. The assault took the Germans completely by surprise and ninety-six men were captured. Maj Hudson assessed that if they had been alert it would have required a battalion-sized unit to take this position. Fg Off Joe O'Sullivan, the first RAF Regt Officer to serve with the Para Coy, stated that the speed of the advance was due to the Levies who, having come from mountainous areas in Iraq, were well used to this type of terrain. The Germans were not alone in being surprised by the speed with which they advanced and the Coy found itself being strafed by RAF fighters, shelled by the Royal Navy and ambushed during the link up with the Army Commandos! Since they had been shot up by the Navy, the Army and RAF, all on the same day, the Levies subsequently regarded themselves as experts in combined operations.

The Coy remained on the hill until the morning of the 12 October when they were relieved by 40 Commando. Back at the beach Brig Churchill informed them they were being returned to Italy for another operation. He congratulated them on their success and expressed his sorrow that they were being taken away from his command. Three Levies had been killed and nineteen wounded in the assault. Three more men later died of their wounds whilst in hospital in Italy.

On 11 November 1944 HQ Land Forces Adriatic (LFA) informed HQ Balkan Air Force (BAF) of their intention to use the Para Coy for Operation FAIRFAX, the invasion of Greece. They were to form part of a brigade of mountain troops, acting as a flank guard with the SBS and the LRDG but they could also be used for a parachute operation. However, on 6 December the Coy was flown to Greece to reinforce the RAF Regiment's No 1321 Wing.

Following the liberation of Greece, the Greek Communist Party had attempted to seize power ahead of the arrival of the Greek Government in exile. This had led to fierce fighting between British Forces and ELAS, the military wing of the Communist Party. Initially the Coy was to provide the guard force for Greek Prisoners of War and there were many incidents of escape attempts and unrest. On 12

Maj Guy Hudson presenting RE Lazar Adam to Air Mshl Medhurst, CinC RAFME at a parade of four RAF Regt Sqns and the Parachute Company held in Cairo on 18 March 1945. (Courtesy the Hudson family)

December the RAF Regiment was relieved by the 2nd Bn of the 4th Hampshire Regiment and they agreed to include the Levies in a more active role. They were involved in house clearing operations supported by Sherman tanks, armoured cars of No 2908 Sqn, RAF Regt and Royal Engineers. During one operation a British officer was wounded and captured by ELAS and later died. Only his beret was located and attempts were made to exchange him for Greek PoWs but this was unsuccessful. He was replaced by Fg Off Sandy Mead of the RAF Regiment. Three Assyrian members of the company were also killed including the Assyrian Company Sergeant Major, WO2 Gewergis Zorzan. Six members of the company were Mentioned in Despatches for their service in Greece. WO2 (CSM) Hutton was recommended for an immediate Military Medal which was turned down by HQ BAF and he was not even considered for a lesser award. This highlighted the difficulties of recommending awards for Army personnel who were serving under RAF Command.

The Para Coy left Greece by sea on 30 January and it was decided that they should return to Iraq and they finally arrived at Habbaniya in April 1945. There they were addressed by a senior officer who congratulated them on their performance, although this also contained a hint of jealousy and expressed some concern that the men might behave in an arrogant manner due to their experience of battle. Since parachute training aircraft were never formally allocated to Habbaniya, personnel were sent to the 6th Airborne Division's PTS at Aqir in Palestine. Joint training was also conducted with units of the 6th Airborne Division who were currently engaged in internal security operations in Palestine.

In January 1946 Maj Hudson handed over command to Sqn Ldr R C Hart, RAF Regt and on 31 July 1946 HQ Levies issued a directive that all units would now be titled in accordance with RAF policy; battalions therefore became wings, companies became squadrons and platoons became flights. On 5 August 1946 Sqn Ldr H Sullivan took over command of the Para Sqn. He was already an experienced parachutist having commanded No 2810 (Parachute) Sqn in the Far East.

On 21 December 1946 the Parachute Squadron was formally disbanded but formed the nucleus of the Wing Special Service Squadron. The disbanding of the squadron was not the end of the British Airborne Force's association with Iraqi Airborne Forces. This continued into the 1970s when Iraqi parachutists attended courses at No 1 PTS at Abingdon. The RAF Levies were eventually disbanded in 1955 when the British left Iraq, leaving many of the Assyrians with a feeling that they had been abandoned, despite their loyal service. The majority of the Assyrian Levies fled Iraq and settled in Australia and the USA. However, some remained and joined the Iraqi Army, later suffering persecution under Saddam Hussein's regime. Some Levies remained in the south in the Basra area. A member of No II Sqn, RAF Regt recalled that during its tour in 2004, he was called to the front gate of Basra Air Station where a former member of the Levies had reported upon hearing that the RAF Regiment had finally returned.

A British officer who served with the Levies, although not with the Para Company was Maj Gen John Frost CB DSO MC, who would become a prominent figure within British Airborne Forces. He stated that 'to this day I feel I never had the privilege of leading better men.'[1] These are significant words of praise from a man who led the parachute raid on Bruneval in February 1942 and commanded the 2nd Battalion of the Parachute Regiment at Arnhem in 1944.

About the same time that the Levies Para Coy was deployed to Italy another RAF Regiment unit was being formed. In August 1944 Capt Colin Irving–Bell, a fluent Italian speaker with No 1 Special Force of the Special Operations Executive (SOE) made a request to Col H M Salmon MC, the Commander RAF Regiment in the Mediterranean Allied Air Force (MAAF) for a small detachment of Regiment personnel to be trained as parachutists, in order to support operations in Italy. They were required for a specific operation,

codenamed CEDARTOWN, which was to attack targets in the Brenner Pass, a vital logistics route through the Alps from Austria into Northern Italy. Capt Irving-Bell stated that they were having difficulty in getting suitable personnel from Army units and he had previously had some contact with the RAF Regiment and was aware of the capabilities of its men. From the large number of volunteers, Fg Off M J 'Mungo' Steele and thirteen gunners from No 2721 (Field) Sqn were selected. They were promptly flown to Bari to undergo a period of intensive training prior to joining No 1 Special Force (SF). They were joined later by nine more volunteer gunners from No 2771 Sqn and placed under command of Sqn Ldr Nicholas Cely-Trevilian, a RAF Regiment Staff Officer from HQ Desert Air Force and a fluent Italian speaker. Sqn Ldr Cely-Trevilian was known amongst his colleagues as Cely, and consequently this group of volunteers became known as 'Cely Force'. He already had experience of working in a small detachment ahead of main forces whilst serving with No 2721 Sqn in the Western Desert, for which he had been Mentioned in Despatches. Fg Off Steele had also been Mentioned in Despatches for operations with the same unit.

Despite intensive training, including parachuting and 40 mile marches, Cely Force had still not deployed operationally by the end of October and it appears that they never did actually deploy in support of No 1 SF. Many SOE and Special Forces operations were cancelled during this period due to enemy activity, the absence of reception parties on the Drop Zones and/or bad weather. It is reported that one planned Special Forces operation in northern Italy was aborted no fewer than ten times after the aircraft had taken off. Enemy activity is the likely reason why the Brenner Pass operation was cancelled. Col Salmon reported in late October that; 'Kesselring inconveniently moved his Headquarters to the spot they were going to drop on!'[2] A later operation to block the main railway through the Brenner Pass was mounted in late February 1945 by a twelve-man detachment from the 2nd Special Air Service Regiment. This operation was unsuccessful and two members were captured and executed. Capt Irving-Bell later deployed on another operation and was also captured by the Germans.

In November 1944 Cely Force was returned to RAF Regiment control as a Special Duties Section (SDS) with No 1328 Wing. In

AVM William Elliott, AOC BAF, accompanied by OC 1328 Wg, Wg Cdr Robert Fleming-Smith, and (left) Brig George Davy, Commander Land Forces Adriatic, inspect the Special Duties Section prior to its assignment to the SBS.

early December 1944 OC 1328 Wing discussed with the commander of the Special Boat Service, Lt Col The Earl Jellicoe DSO MC, the lessons learnt from No 2908 (Field) Sqn's role whilst supporting the SBS in Greece in September/October 1944. Following this, arrangements were made with Chief of Staff LFA that Cely Force should be attached to the SBS.

In late January 1945 Yugoslav partisan forces captured the port of Zadar. Despite the restrictions on Allied forces operating on mainland Yugoslavia, the partisans agreed that they would benefit from air and sea support co-ordinated from within Yugoslavia rather than from Italy. This led to Operation ACCOMPLISH, which included the deployment of No 2914 (LAA) Sqn to accompany a refuelling and rearming party to the airfield at Prkos, near Zadar. Zadar became the location for HQ LFA and HQ SBS whose squadrons commenced operations in the islands off of the Yugoslavian coast. Cely Force was initially attached to 'S' Squadron for operations on the islands of Cherso and Lussino.

On the night of 20/21 March 1945 Sqn Ldr Cely-Trevilian accompanied a fourteen-strong SBS patrol on a road watching and

ambush operation on the Island of Cherso, which lies close to the Istrian Peninsula and dominated the approaches to the mainland. They conducted nightly patrols, mounted from the nearby island of Levrera. Sqn Ldr Cely-Trevilian reported:

> 'It was great fun; I enjoyed it enormously; I went as a patrol-man of course, for the experience. I expect you will have heard that we were lucky enough to get the Commander of the two Islands (CHERSO and LUSSINO) a Naval Captain, Dammrich, and his driver and staff car – a very useful contribution! We also caught a military motor barge and a caique and shot up a three tonner carrying troops, causing damage and casualties – or so it is believed; unfortunately it got away. Both our scraps were somewhat one-sided and rather unsporting! But the experience was most valuable.'[3]

Operations continued in April and included a patrol, under Flt Lt Steele, landing by rubber dinghy early on 3 April at Bagna Cove on Cherso. Their mission was to conduct a reconnaissance of Lorenzo, Smergo and San Vito in order that attacks could be carried out on enemy positions. This reconnaissance was to be complete by the night of 5/6 April when they would either extract themselves or call forward patrols to carry out the raids. They observed a house being used by Italian Fascist troops and were then reinforced by the remainder of 'B' Patrol and seven SBS personnel. Prior to the assault, the Italians were given the opportunity to surrender which they accepted. After collecting items of intelligence interest the patrol returned to the bay with seven prisoners.

On 18 April Cely Force conducted its last operation and deployed four recce patrols in order to gain intelligence prior to launching an attack on enemy positions. One patrol, comprising just Sqn Ldr Cely-Trevilian and Cpl Herlihy, landed at Tomosina Bay and spent the next day observing the approaches to the town of Neresine. Whilst planning the attack for later that evening they observed a 600-strong partisan force, who, having taken Ossero had approached Neresine and attacked the enemy positions. The unexpected arrival of this force caused the cancellation of the planned attack that evening. By 22 April the partisans were able to confirm that Cherso and Lussino islands were now fully occupied by Yugoslav troops therefore all forthcoming

operations were cancelled.

On 8 May, following the announcement of the unconditional surrender of the German Forces, OC SBS addressed the men after which celebrations were held which culminated in all ranks listening to a broadcast by His Majesty the King. The following day, OC 1328 Wing was told that all projected SBS operations were to cease, and that the SDS could be released to participate in Operation FREEBORN, the deployment of the wing to Austria. On 20 May the Wing HQ arrived in Klagenfurt, Austria. The SDS was then disbanded and all ranks posted to squadrons within the wing. Sqn Ldr Cely-Trevilian was again Mentioned in Despatches and subsequently appointed OC 2771 (Field) Sqn, which he took to Palestine in March 1946.

As Cely Force was being disbanded another parachute unit was being raised in the Far East. In 1945 the RAF Regiment in the Far East comprised ten wings which included sixteen Field Squadrons and twelve LAA Squadrons. On 4 June 1945, No 2810 (Field) Sqn received a signal ordering it to move to Agartala pending further instructions. It was to be re-roled in order to support the RAF Airborne Commando, another newly formed unit that was responsible for co-ordination of air support to forward ground units. The Airborne Commando was officially formed on 23 June 1945 and later changed its title to the Airborne Control Unit. This unit absorbed all the Visual Control Posts (VCP) that were responsible for the calling-in and directing of air support for the Chindit Special Force who operated in the long range penetration role and also with various clandestine services such as Force 136 of the SOE. A directive on the employment of RAF Regiment personnel in support of the Airborne Commando stated:

> ‘The function of the RAF Regiment Field Squadron will be to protect RAF personnel and to hold and protect a limited area behind the lines while an air strip is being constructed or repaired and while fly in or pick-up operations are taking place. This Squadron will only carry out small scale operations on which the regular Airborne Forces will not be engaged’.[4]

In the opinion of the CO of the Airborne Commando, Sqn Ldr (soon to be Wg Cdr) Thomas Tull, it was necessary to allot a squadron

to the role as this was the smallest self-contained unit in the RAF Regiment; however, it would not be the intention to use the entire squadron at any one time. It was also argued that, as they were already operationally trained troops, they were the most suitable personnel available for the task of protecting the VCPs. Another argument was that a field squadron had an integral mortar section which would be ideal for use in target indication when the VCPs were operating with local patriot forces. Sqn Ldr Tull was already experienced in airborne operations. He had jumped with a RAF VCP detachment attached to the Composite Gurkha Parachute Battalion from 50th Parachute Brigade during Operation DRACULA (the abortive airborne and amphibious attack to retake Rangoon) in May 1945. The mission of the Gurkha Para Bn was to neutralise a Japanese artillery battery at Elephant Point. Sqn Ldr Tull's eight-man team had jumped in the first wave with the Pathfinder element ahead of the main drop. One of the British Gurkha Officers who jumped with the main body was Lt George Foskett. He later transferred to the RAF Regiment and was the first Flight Commander of No 1 (Parachute) Flight of No 63 (Rifle) Sqn which was formed in 1948.

On 4 July 1945 Sqn Ldr H Sullivan arrived to take command of the squadron. Over seventy airmen, and all but one officer, chose to transfer to other units as they did not want to commence parachute training. These men were replaced with volunteers from other RAF Regt units in the South East Asia Command. The squadron was to move immediately to a concentration area at RAF Hakimpet and co-locate themselves with the Airborne Commando which later moved onto Begampet.

On 5 August 1945 Wg Cdr Tull met with Brig Poett, commanding 5th Parachute Brigade, in order to discuss the composition of teams for the forthcoming airborne contribution to Operation ZIPPER, the invasion of Malaya and Singapore. It was decided that four airborne teams and twenty RAF Regt personnel were to be used for an airborne operation with 5 Para Bde. Seven other teams were to drop to join up with parties of guerrillas and levies, raised by Force 136 agents. Shortly after returning from completing his parachute course, LAC Alan Barkes recalls:

'I remember an officer whose command was "I need 8 men.

Personnel of No 2810 Sqn prior to a parachute training jump, the CO, Sqn Ldr H Sullivan, in the centre.

> Follow me. From now on you will receive no mail and will not be writing home." We were then told that our stay could be for an hour, a day, or more and we were told to sleep in our clothes (including our boots!) and that we had to get our heads down by 10pm. As the officer told us "Any time now lads and this is IT. We are an advance party and will be parachuting into the Malayan jungle and there may be some bitter fighting." In the middle of the second night he came and told us we were moving out and we were to board a Dakota at a nearby airstrip. We could not believe that, as we reached the aircraft, it was announced by an officer that THE WAR WAS OVER! The Americans had dropped the two big bombs. The Japanese had surrendered'.[5]

On 14 August 1945 the Japanese surrendered unconditionally following the attacks on Hiroshima and Nagasaki. Despite the news of the surrender the squadron received an urgent signal on 16 August 1945 from Wg Cdr Tull that all personnel who had not completed parachute training were to proceed immediately to RAF Chaklala as

some VCPs were still going to be dropped as planned. Another VCP was attached to the Commando Brigade. Sqn Ldr Sullivan, wrote in the squadron diary:

Sqn Ldr Sullivan, OC 2810 Sqn, accepting the surrender of Japanese officers.

> 'The sudden end of the Japanese War found the personnel of the unit with mixed feelings. Very few were really glad and the main worry was that parachute training would be discontinued before the whole unit was trained. They were still very keen and expressed regret that they would not get a "go" at the Jap. Those already parachute trained are interesting. They have a standard of morale higher than when they went on the course and, since attending the course, I realise why. The course is well run and the instructors are magnificent. The superiority one feels on completion of a jump successfully is unbelievable. At the moment, jumping is all they talk about and future jumps all they think about. The unit is a complete Field Squadron, all parachute trained, young, fit "jump happy" and keen to have a crack at anything.'[6]

On 29 August Wg Cdr Tull arrived at the Squadron with the brief that they were now required for Operation MASTIFF, the operation to find and recover internees and prisoners of war. The RAF Airborne Control Unit was to provide twenty teams for the operation. These were to comprise one officer, two wireless operators and two medical personnel. Two officers and 56 Airmen from No 2810 Sqn would be held in Ceylon and at Jessore in reserve in order to reinforce the teams should it be necessary.

Cpl Lionel Groome, a Sqn Nursing Orderly was one of the group that deployed to Ceylon; however, there was a lack of parachute trained medical personnel so he joined a seven-man team which

included an Army Medical Officer and four Dutch soldiers. They were dropped into Soerabaya, Java on 18 September 1945. For his subsequent actions Cpl Groome was awarded the Military Medal. His citation read:

> 'On 29th October, following various incidents, the British party became the object of all types of small arms fire. The party withdrew to a hotel which was organised as a defensive position with the aid of a platoon of Rajput Rifles. Sniping became intermittent and on 29th October, the Indonesians made a frontal attack on the hotel, and the party was forced to withdraw from the front of the hotel. Casualties were sustained by IORs (Indian Other Ranks) and Corporal Groome tendered first aid under fire. Later, when a Bren gunner became a casualty, Corporal Groome, although a nursing orderly, took over the gun and handled it with such efficiency that he considerably helped to repel the Indonesians, who were prevented from reaching the upper floors of the hotel. Corporal Groome then proceeded to render first aid to the wounded, and, while so doing, was taken prisoner. He was released on 3rd November 1945.'[7]

On 25 September the re-organisation of the squadron back to a regular Field Squadron commenced. It was announced that they were to move to Singapore under HQ Malaya as the Command Reserve, deployable, by parachute if required, to reinforce other RAF Regt units. The squadron was also tasked with a ceremonial guard role. All personnel who were not yet parachute qualified, and who still wished to be so, were attached to the Airborne Control Unit prior to proceeding to Chaklala with orders to catch up with the squadron once they had completed the course. As with the Army's 5th Para Bde and despite many close calls, the squadron never actually deployed on a parachute operation. Despite this it impressed many connected with Airborne Forces. One report stated:

> 'The OC No 3 PTS, Chaklala, W/Cdr Shields and his instructors, have expressed the greatest admiration for the R.A.F.R. personnel passing through the school. They compare them with the original army volunteers of 1941 who, it appears, were as a whole, the best paratroop material so far encountered'.[8]

On 12 October the squadron embarked at Calcutta to begin its move to Singapore. Conditions on board were very poor and some Army units marched themselves off in protest. On 26 October the ship docked at Singapore and the squadron moved to Kallang where it joined No 1324 Wing, RAF Regt. Here they discovered the extent of Japanese atrocities, including the hanging of young girls on lampposts. On 28 October 1945 the squadron was ordered to maintain its parachute role and training was to be resumed. However its main role was mounting ceremonial guards and anti-looting piquets. They provided the guard at the residences of the Lord Louis Mountbatten and Air Marshal Sir Keith Park, CinC ACSEA, and mounted Guards of Honour for various Royal and other dignitaries who visited Singapore.

Although the War had ended the RAF Regiment was involved in numerous operations in Indonesia in the latter half of 1945 and 1946. In June 1946 a flight from No 2810 Sqn was flown to Sumatra to assist local forces in rescuing civilians who were being interned in a rebel camp in Padang. Fifty-two prisoners were released and ten Indonesians captured in a dawn raid which achieved complete surprise. The flight also carried out another raid on an Indonesian camp several weeks later in which nineteen Indonesians were killed and five captured.

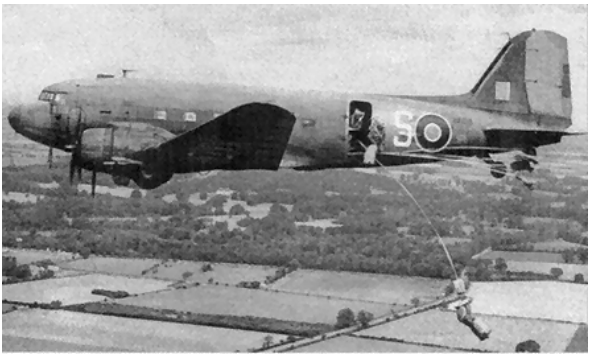
By the end of 1946 all RAF Regiment squadrons in the Far East had been disbanded except for No 2810 (Field) Sqn which remained in Singapore until 1947 when its role was taken over by the newly formed squadrons of the RAF Regiment (Malaya).

In 1947 HQ 38 Group was tasked with investigating the requirement for an air transportable capability for an RAF Regiment wing. It was subsequently proposed that No 2 Wing with its HQ at Netheravon, would be selected for the air transportable role. No 2 Wing comprised No 15 (LAA) Sqn, co-located with the Wing HQ; No 63 (Rifle) Sqn at Upavon and No 16 (LAA) Squadron at Watchet. No 63 Sqn was to re-role so that its flights could deploy by parachute, Horsa and Hamilcar gliders, or land in aircraft such as the York and Dakota. The LAA squadrons, equipped with 40mm Bofors guns, were to train in order to be able to deploy their guns after landing in Hastings or Valettas. Both of the LAA units also formed small parachute elements and trained personnel to land by glider.

A 40mm Bofors being unloaded from a Hamilcar by No 15 (LAA) Sqn personnel. (RAF Regiment Museum)

All personnel who volunteered for parachuting were required to complete a week of physical training which was conducted within their respective squadrons prior to attending the Basic Parachute Course at No 1 Parachute Training and Glider Training School at Upper Heyford. The first course for No 2 Wing personnel was completed on 13 May 1948. These men parachuted into Netheravon at the end of their course in conjunction with Exercise MEPHISTO. The MEPHISTO series of exercises was regularly conducted by the School of Air/Land Warfare at Old Sarum. In November 1948, No 63 (Rifle) Sqn conducted Exercise NOVICE, which involved the Parachute Flight jumping into Salisbury Plain from Dakotas and securing an airstrip for the rest of the squadron to land by glider the next day. A subsequent demonstration included a Hadrian landing and unloading a mortar team, the glider subsequently being recovered by being 'snatched' by a Dakota.

In June 1948 there was a proposal by Air Chf Mshl Slessor that that the RAF Regiment should take over the functions of the Glider Pilot Regiment (GPR) and of the air despatchers of the Royal Army Service Corps. The Director General of Ground Defence concurred with respect to the GPR, but not the air despatch role. The men of the GPR were not mere pilots, being described, for instance, as 'Total Soldiers' by General Sir John Hackett who had commanded the 4th



No 63 Sqn personnel jumping from a Dakota with equipment bags.

Parachute Brigade at Arnhem. After a glider pilot had landed his aircraft they had no means of returning to their departure airfield and were required to fight alongside the men they had just transported into battle. The officers and NCOs of the GPR were, therefore, subject to the same high standard of selection and training as all other parachute and glider-borne units within the Airborne Division. Slessor's idea got no further, however, and the GPR remained with the Army until it disbanded in 1957.

The two Sections of No 63 Sqn's No 1 Parachute Flight, were commanded by FSgt Norrie Chapman MM and Sgt Jimmy Black MM. FSgt Chapman had won the Military Medal, and been Mentioned in Despatches, whilst serving in Italy and France with the 5th (Scottish) Btn of the Parachute Regiment. Sgt Black had won his MM whilst serving as the Troop Sergeant Major with 48 (Royal Marine) Commando. Coincidentally, both men had been decorated for actions during which they had covered the withdrawal of their men to safety with the use of Bren gun fire. This is also the case with Cpl Groome of No 2810 (Para) Sqn. Flt Sgt Chapman would later serve with No II (Field) Sqn after it had converted to the parachute role and would become the Squadron Warrant Officer.

Although the parachutists of No 2 Wing had completed the course at No 1 PTS, they were not officially authorised by the Air Ministry to wear parachute 'wings' on their uniforms. However, the men did wear their badges above the right breast pocket of their battledress jackets. The case for RAF personnel to be permitted to wear parachute badges, other than Parachute Jump Instructor badges, was still being argued in the early 1950s when Medical Parachute Teams were formed in the Middle East. However, it was 1962, when No II (Field) Sqn was re-

roled as a parachute squadron, before the Air Ministry finally approved the wearing of parachute 'wings' by RAF personnel. Prior to this there were many operationally qualified personnel serving in the RAF who had to justify their right to wear their parachute badges. These included many former Parachute Regiment and Special Forces personnel who had transferred to the RAF after the war. One such officer was Lt Andy Roberts who had fought with the 2nd Btn of the Parachute Regiment at Arnhem. He transferred to the RAF Regiment in 1949 and retired as a squadron leader in 1978.

In 1950 the wing lost its air transportable commitment. Apart from a degree of confusion over an operational parachute role for the Regiment, it was concluded that the LAA squadron's Bofors guns were unsuitable for movement by Hastings and, besides the guns issue, there was, in any case, insufficient airlift capacity to transport the squadron's other vehicles. Another adverse factor was that, due to the war in Korea, priority had to be given to defence of the USAF airfields at Sculthorpe, Lakenheath and Mildenhall against the possibility of sabotage.

All the wartime capabilities mentioned above continue to be covered by current RAF Regiment parachute units. No II Sqn is still deployable by parachute and gunners serve in the Special Forces Support Group as well as the Tactical Air Control Parties of 16 Air Assault Brigade.

Notes:

1 Frost, Maj Gen JD CB DSO MC; *A Drop Too Many* (Buchan and Enright, 1982).

2 Report to Maj Gen Sir C F Liardet dated 31 October 1944 (Col Salmon papers, RAF Regt Museum).

3 Report from Sqn Ldr Cely-Trevilian to OC 1328 Wing, RAF Regt (Col Salmon Papers, RAF Regt Museum).

4 RAF Airborne Commando Directive with Force 136 (TNA AIR 2/10076).

5 Letter to the author from Alan Barkes, No 2810 (Para) Sqn.

6 F540, No 2810 Sqn, RAF Regt, August 1945 (TNA AIR 29/103).

7 Citation held in the personal file of L Groome (RAF Regt Museum).

8 Report by Sqn Ldr H Sullivan (TNA AIR 2/10076).

AIRBORNE DELIVERY WING – CURRENT PARACHUTING CAPABILITIES

Wg Cdr Wayne Loxton

Wg Cdr Loxton joined the RAF in 1986 for a first tour as PEdO and CSRO at Chivenor. He became a PJI in 1989 and served as such with No 1 PTS, 5 Airborne Brigade and the Joint Services Parachute Centre. To date his subsequent carer has embraced tours with the RAF Det to SF and the Parachute Test Team at Boscombe Down, interspersed with staff and/or training appointments at Halton, Cosford, DSF, HQ PTC, HQ 22 Gp and the JSCSC. Along the way, he managed the Great Britain Team at the 1994 World Formation Skydiving Championships. He is currently OC Airborne Delivery Wing at Brize Norton.

Introduction

The aim of this paper is to outline two of the current parachuting capabilities that operate at opposite ends of the spectrum; first, low level parachuting and, then, high level parachuting and, more specifically, High Altitude High Opening (HAHO). In doing so I hope to highlight the overall contribution of Airborne Delivery Wing (ADW) and the RAF by providing personal accounts of some of the Parachute Jumping Instructors (PJI) involved with the development of these parachutes. These accounts are personal opinions and are not necessarily official Defence policy, but they do set the context.

Peter Hearn

Peter Hearn

Before we review these capabilities, it is appropriate to acknowledge the contribution that one of the earlier speakers has made to airborne forces. There are a number of important pioneers of military parachuting and the airborne capability; Louis Strange, Maurice Newnham and other men of vision, but there is one important name missing and that is Group Captain (Retired) Peter Hearn. Charlie Shea Symonds of Royal Aero Club fame regards Peter as one of his

heroes. I can echo that sentiment and I have to pinch myself that my name is on the same Commanding Officers board as that of Peter Hearn. He was awarded the Air Force Cross in 1961 for the development of military free fall training and he was the founder of the 'Big 6', the first UK parachute display team and forerunner of the RAF Falcons. As a true pioneer of military and civilian free fall parachuting, he competed in the 1960 World Championships and along with his skydiving partner, he was the first parachutist in the UK to have the skill to pass a baton in free fall. He inspired a generation of men and women who wanted to fly through the air – although to use the famous Toy Story quote, what we really do is 'fall with style'. Whilst Andre Jacques Garnerin may have started it all, Peter and his band of PJI adventurers certainly did their bit along the way.

The ADW's badge

Airborne Delivery Wing

Airborne Delivery Wing took over from No 1 Parachute Training School (PTS) as the lead parachute training formation in November 2009. Whilst No 1 PTS still exists, it is now a delivery squadron within the ADW. The original badge has been modified, although the Pathfinder Torches suspended from a parachute have been retained along with the famous motto 'Knowledge Dispels Fear'. In modern parlance, ADW contributes to the 'generation of the force'. Within this context the wing is a 'force element' of the 'Air Manoeuvre pillar', currently commanded, via the Station Commander at RAF Brize Norton and Air Officer Air Manoeuvre, by AOC 2 Gp. Its functions are: to provide direct in-situ operational support to UK airborne units; to enable the National Contingency capability for Joint Helicopter Command, Navy Command and Air Command parachuting units; and to deliver initial and continuation training for the Defence parachuting community.

Low Level Parachuting

The current static line round parachute that we all associate with mass para drops is rather imaginatively called the Low Level Parachute – the LLP. Originally made by Irvin Parachutes, it is now

made by Airborne Systems Group. It has an all up mass of 350 lbs and had an original operational clearance of 250 ft above ground level (AGL), although, following a series of live test jumps in 1997, the clearance was raised to 400 ft AGL. Under training the LLP is used from between 600 ft and 1000 ft depending on the jump platform. It is an excellent parachute and since its introduction into service in the early '90s, it has never malfunctioned.

The 250 ft drop over Lac Ganguise on17 September 1997

The 250 ft Trial

In a previous life, I was fortunate enough to be 2 I/C of the Parachute Test Team at Boscombe Down and one of the five test jumpers that used the LLP at 250 ft without wearing a reserve. Although wearing a reserve would have been useless at that height, I must admit that psychologically 'not wearing a reserve' was a big deal. To place some perspective on the altitude, imagine looking at the centre of the London Eye – that is just under 250 ft and it was from this height, on 17 September 1997, that the jump was made from a C-130K over Lac Ganguise in the South of France.

The 'boffins' at Boscombe Down had calculated that in all probability we were unlikely to reach terminal velocity from that height and that there was a good chance of survival in the event of a partial malfunction. For that reason, we were instructed to jump over water and, despite the 90ºF heat, wear full body wetsuits to keep any possible broken bones in place. Whilst it was very exciting to leave the aircraft at 140 knots and to see your own shadow on the water below you during the throw forward phase of the deployment, the concept was unfortunately flawed for a number of reasons.

The notion that an aircraft could acquire a Drop Zone (DZ) at 250 ft was based upon old doctrine and in reality modern air defence systems mean that it would be extremely difficult to fly at that altitude safely. In addition, DZs are rarely flat fields and usually have undulating terrain, so it is impossible for the aircrew to guarantee 250 ft without actually flying considerably higher. This was another reason why the descent was made into water. The ability to guarantee 250 ft during the trial was vital because whilst the LLP had never malfunctioned during testing, the worst case full-deployment sequence was around 190 ft; add this to the knowledge that the pressure altimeters fitted to the C-130 fleet had a +/-70 ft error and the maths simply don't add up and, if the environment was benign enough for the aircraft to reach the DZ at 250 ft, then it would be possible to take the extra split second to pop up to 400 ft, which would be safer in every respect. This extra height allows the parachutist to carry out his in-flight drills correctly, kick out of the inevitable twists, lower his equipment and, crucially, provides sufficient height for a viable reserve parachute. All of this is relevant because, unlike an ejection seat parachute, which is a 'fit to survive' system, the airborne soldier requires a 'fit to fight' parachute, so landing in twists or with his container fitted that could break his ankle is a big issue.

Operational Relevance

So where does this fit in operationally? There are a number of analysts and operators who are very clear that mass parachuting has no place in modern warfare. They could be right and the prospect of a thousand or more troops dropping from a large fleet of aircraft within the near future is pretty remote. However, I suggest that it is rather premature to dismiss it outright.

The recent coercive effect that the French had dropping into Mali was significant and I was fortunate to spend some time in Corsica with the French Legionnaires from *2ème Regiment Estranger de Parachutistes* (2REP) who inserted into the Operation – and try telling them that there was no operational effect! The US had similar experiences in Afghanistan and Iraq and let us not forget the 'Support and Influence' effect that No 2 Sqn RAF Regt had in January 2001 when they were inserted by static-line round parachute into Sierra Leone as part of Operation SILKMAN. The low level parachuting


High level parachuting can involve free fall (left) or HAHO (right).

capability features within a number of current Defence Strategic Assumptions and 16 Air Assault Brigade, who are the prime users of the LLP, are very clear what their role is – and parachuting within the concept of air manoeuvre is very much part of it, particularly when it involves interoperability with another nation.

High Level Parachuting

The opposite end of the spectrum is High Altitude High Opening or HAHO parachuting. This involves exiting an aircraft at very high altitudes and travelling long distances, using oxygen, and navigating under the canopy using the Global Positioning System (GPS) to land accurately, as a group, on a chosen target. The current HAHO parachute is called a Blue Track 80 (BT80), a derivative of a tandem parachute system made by Aerazur in France. The BT80 has been in service since 2005 and, with a simple deployment bag change, it can be used in either free fall or static line mode. It has an all up mass of 350 lbs, but with the addition of a shock attenuation device on the static line, it can carry up to 420 lbs.

As you can imagine, exiting an aircraft at high altitude using a parachute that is attached to the aircraft, carrying considerable weight and wearing oxygen is pretty demanding and the opening shocks can

be extreme. In order to reduce this shock the parachute deployment is staged and progressive in nature and it can take 8 to 10 seconds as opposed to the usual 3 second counts normally associated with parachuting. The complexity of the static line square configuration also taxes the Military Aviation Authority, which is currently grappling with the problem of how to regulate parachuting within a post Haddon-Cave environment.[1] They need not worry too much, as military parachuting is extremely well regulated within the AOC 2 Gp Air Safety Management Plan. Whilst it is very difficult to regulate the chaos of lines and material in a disruptive air flow, in terms of risk management, each of the nine different parachute systems that are currently in service are assessed and managed robustly within the same Duty Holder process as a C-130 or Voyager aircraft.

HAHO Origins

As with most great ideas, there was an element of fortune in the development of the HAHO capability and a number of RAF PJIs played a significant role in the process. In 1980, Sgts Ali Macdonald and Phil Kelly, from the Parachute Test Team at Boscombe Down were tasked with reviewing the new ram air square parachute that was to replace the suite of round parachutes that were currently being used for free fall – High Altitude Low Opening. As part of this trial, the scientists were concerned about the opening characteristics of the square parachute at altitude and what would happen if the parachutist operated his parachute shortly after exit. So it had to be tested, first with dummies and then live.

Prompted by the recent retirement from Service of the GQ360 parachute that was the initial HAHO parachute, the now WO (Retired) Ali MacDonald put pen to paper to write an accurate account of the development of the parachute and its use for over 30 years. His work is as yet unpublished, but with his blessing I would like to share his personal account of one of the descent profiles that historically may be

[1] Charles Haddon-Cave QC was appointed to conduct an independent review into the broader issues surrounding the loss of a Nimrod, XV230, in Afghanistan in 2006. Presented to the Secretary of State in October 2009, and subsequently published as HC1025, among its several recommendations was the establishment of a 'New Military Airworthiness Regime (under the control of an independent Military Airworthiness Authority)'. **Ed**.

quite significant:

Sgt Ali MacDonald.

> ‘On 16 Oct 1980, Kelly and MacDonald boarded a C-130 for a 25,000 ft serial over Fox Covert DZ. The [*other*] troops exited at 25K and free falled down to 5K before operating their parachutes. The aircraft then descended to 17K to despatch us. We jumped out and operated the new square parachutes at 15K, which at this time was the highest altitude that we had ever deployed a square parachute. They opened fine and equipped with a Silva compass and 10 miles from the DZ we headed for the Covert. The [*other*] troops had already landed and had packed up ready to leave, only to be surprised by the 2 PJIs that were on their aircraft arriving on the DZ in complete silence and unannounced. During the subsequent discussion and trip back to their unit the way ahead was being formulated.’

I have been privileged to be involved with testing parachutes and was involved in the initial trial that brought the current HAHO parachute into service. I had a few ‘dodgy’ openings, particularly on one German system that was immediately discarded, but there is a second account in Ali’s script that had me shivering. The scientists were also concerned that the rigging lines of the parachute would freeze when being used at high altitude and on one sortie, Kelly and Macdonald were deliberately despatched into cumulonimbus cloud. Ali recalls:

> ‘The parachutes would buck violently in the cloud. Hoar-frost would form on the rigging line and on our faces, the needle of the Silva compass would spin aimlessly and ice particles would form on the canopy and then break away, falling all over us. However the parachutes held together and the build-up of ice would always break up owing to the constant flexing of the canopy cells. […] That day we really earned the extra £1.12 trials pay!’

Sgt Rex Pritchard.

The cold is still a problem and from those early days bespoke high altitude parachute clothing systems have been developed, along with locking cleats on the parachute risers which ensure that a parachutist does not have to use his hands above his head throughout the descent, as temperatures of -54ºC at 33,000 ft are not uncommon.

All of that early HAHO work was conducted in free fall with short free fall delays and it was another three years before a static line square system was fully developed and once again RAF PJIs from Boscombe Down played a key role. At the higher altitudes, the opening of the parachute needed to be slowed down and a range of deployment inhibitor devices were developed by PJIs such as Sgts Davey Jones and Rex Pritchard, who was, incidentally, the very last RAF serviceman to receive the Air Force Medal in 1993.

These devices and packing methods successfully slowed the deployment sequence and reduced the opening shocks. However, on one such occasion, the parachute did not operate quite as planned and during one of the early GQ360 static line descents at 25,000 ft, Sgt Pritchard had a nasty shock. Immediately after exit, Rex's canopy blew up and split right down the middle; after operating his reserve, he found himself drifting under a round canopy with limited steering. Thankfully, 30 minutes later he landed safely, and not too far from his intended DZ. However, all was OK with Rex because at this stage, trials pay had increased to £1.38 per jump! Using round reserves severely limited the application of HAHO parachuting which prompted the development of a square reserve and today we have parachute systems that have exactly the same main and reserve parachute, making them inherently safer. It also maintains the integrity of the operation as the parachutist can rejoin his patrol with relative ease.

Operational Relevance

Operationally, the utility of HAHO parachuting is entirely credible,

The tandem capability conferred by the BT80 parachute.

although of course the environment still has to be relatively benign and targets within extensive air defence systems are not a realistic proposition. But the capability is most certainly viable, especially in the environments within which we have been operating of late. Our current capability also allows for the insertion of a non-parachuting specialist, or a large bundle of equipment using a compatible tandem parachute system. The BT80 parachute is due to be replaced in 2015, and high-glide canopies with 6:1 glide ratios are being explored – these are, in effect, para-gliders that open like parachutes. It is, however, a complex technology, especially when there is a need to carry heavy weights and attach a static line to the aircraft, but one of the most significant advantages of a higher glide canopy is that it can be used at lower altitudes, which reduces the reliance on oxygen systems.

These canopies, coupled with more advanced GPS, have quite literally taken HAHO parachuting to new levels and things have certainly come a long way since MacDonald and Kelly inadvertently ventured into the realms of stand-off parachuting, whilst navigating across the cumulonimbus filled skies above Salisbury Plain, equipped with a simple Silva compass taped to their chest straps.

AFTERNOON DISCUSSION

Wg Cdr Jeff Jefford. I have two questions. For Wg Cdr Loxton – in your first film clip we saw parachutists leaving a Hercules via the side door. As a layman, I would have gone off the ramp. Why use the doors?

Wg Cdr Wayne Loxton. Using the doors you can drop a continuous stick of forty-five parachutists – from each side. Using the ramp it's batches of twelve to sixteen at a time. The limiting factor is to do with the opening characteristics of the individual parachutes.

Wg Cdr Jeff Jefford. Thank you. And for Seb Ritchie – you told us that, post-D-Day the RAF was confined to glider-towing and we stopped dropping parachutists. Was that a resource constraint or some sort of political decision?

Seb Ritchie. We did continue to drop Pathfinders but beyond that it was just gliders. I think it came down to a sensible division of responsibilities within 1st Allied Airborne Army which was set up in 1944. The Americans had used the Horsa on D-Day and hadn't really enjoyed the experience. Post-Normandy they wanted nothing more to do with Horsas so it made sense for the British to utilise all of the available glider lift on the understanding that the Americans would use their capacity to deliver parachutists.

AVM Peter Dodworth. May I first congratulate the team on what has turned out to be a fascinating day – I knew little of this. We heard, in the context of MARKET GARDEN for instance, of the considerable losses in aircraft, men and equipment and the difficulties involved in recovering casualties, rescuing people and so on. Before such a large-scale operation was mounted, would someone carry out an assessment to compare and contrast the proposal with other ways of doing it? Any military operation is bound to involve casualties but airborne assaults do seem to have been inordinately expensive.

Seb Ritchie. With respect to the three operations that I addressed in my presentation, I have not found any evidence to suggest that there had been a comparison exercise of the sort that you describe. It may have been done in other cases, but not in those three.

Sir Rupert Smith. As to the specific issue of the estimation of casualties, I am confident that, certainly by 1944, that will have been done as matter of course, because it is a critical planning issue for the medical staff. There is, of course, an expectation of casualties. They are, after all, inevitable, but one would not knowingly expect to lose an entire unit. In the case of the RAF, for example, it is not assumed that an entire squadron will be *permanently* committed; tasking is more likely to be expressed in terms of numbers of aircraft to be available, or the number of sorties to be flown, per day. It is the same in the Army. It makes no sense to knowingly permit an entire unit to be destroyed, so the aim is to preserve at least a nucleus so thar it can be rebuilt. That was one of the reasons why the airlanding battalions were as strong as they were – it permitted them to tolerate the anticipated level of casualties. So there is – has to be – an expectation that you will sustain casualties when conducting high risk operations.

Here is another thought. When one goes through the manuals and reads of the planning processes of that time, it becomes apparent that war is, in many respects, an 'industrial' process and in WW II there will have been an assumption that the national 'machinery' would be able to provide the necessary replacements in both men and equipment in order to fill the gaps in the ranks. Today, of course, we simply do not have the production lines or large stockpiles held in depots – and we do not conscript – so we can no longer even think in those terms. That said, I believe that the generals of WW II were not unconscious of this issue. Their personal experience of heavy losses, through their having been the platoon commanders of the First World War aside, it was apparent from D-Day onwards that we were beginning to run out of infantrymen. In fact UK Ltd was running out of manpower – we were having problems finding enough people to run the mines – and, with the establishment of air superiority we began to re-role air defence units into infantry in order to maintain our fighting strength.

In short, I think that there has always been a consciousness of casualties but tempered, in the past, by a greater willingness to tolerate them.

Steven Mason. We have heard something of the German experience, notably in Crete, and of our own later operations from HUSKY

onwards. To what extent, if any, were we able to learn from what the Germans had done?

Ritchie. Our knowledge of what the Germans had done in Holland and the low countries was poor but for Crete it was excellent. The allies had done a detailed analysis, facilitated by captured documents, interrogation of prisoners and so on. So we were certainly well aware of what the Germans did, but how far that influenced our planning is another question. You have to ask yourself – do we really want to do what the Germans did on Crete in view of the very heavy casualties that they had sustained there? Perhaps it was more a matter of avoiding doing what the Germans had done.

Air Cdre Graham Pitchfork. Another one for Seb. I was doing some work on D-Day recently and I was struck by the extent of the preparatory training – large scale exercises – rehearsals – that were conducted. In particular the RAF did long range night navigation exercises, sometimes with a glider on tow. By contrast, I believe that the Americans confined their efforts to formation leaders. On the night, of course, some of the Americans ran into bad weather which broke up formations and that may explain, at least in part, why their drop was so scattered. Do you have any thoughts on that?

Ritchie. What you say is true. There was a different approach. The RAF had more highly trained individual aircrew while the Americans adopted a 'mass' approach. Their aim was to get as many aeroplanes in the air as possible and they simply lacked the capacity to train, to an appropriate standard, all of the men who would have to fly them. That said, although there was less emphasis on training, a lot was done prior to D-Day, although there were two fundamental problems. One was the sheer scale of the enterprise, the other was the difficulty in replicating operational conditions but, despite this, there was, I think, an assumption that it would be 'alright on the night', that the operation would only be launched in good weather and that they would be able to cope with *Flak* – somehow. That turned out not to be the case, of course, but the last thing you want to do is make training so realistic that you start taking casualties during exercises. So I think that the shortcomings arose from the scale of the operation, which meant that

some corners may have had to be cut in training, and the difficulty in simulating the conditions that would actually be encountered.

Richard Bateson. Do you think that one of the main factors driving MARKET GARDEN was the need to eliminate the V2 launch sites that were bombarding London and Antwerp, rather than the thrust towards Wesel.

Ritchie. That was certainly an argument deployed by Montgomery while he was promoting the northerly route and, shortly before MARKET GARDEN was launched he received a message from the Chiefs of Staff underlining its significance with respect to the V2s. Even so, the Second Army commander, Lt Gen Dempsey, wanted to move the operation further south, and there is some evidence that Browning shared this view. The head of intelligence at 21st Army Group later recorded that Montgomery rejected the idea of a more southerly route because it would have meant sharing the Rhine crossing with the Americans, which was the last thing he wanted to do.

Wg Cdr Malcolm Ward. I have a question on the RAF's new low level parachute – the LLP – which looks remarkably like the Russell lobe parachute that my father used to jump with in the 1930s. He described the Russell lobe as an excellent canopy but with a dodgy opening system so I was intrigued to hear that the LLP can take up 190 feet to open, even with a static line. Can anyone expand on the evolution of the canopy and its opening sequence?

Wg Cdr Wayne Loxton. The shape of both the Russell lobe and the LLP canopy is fundamentally different from that of the 'traditional' PX type that Peter referred to earlier. The deployment system involves a mini-pilot 'chute that comes out first to become, in effect, a second static line that actually inflates the main canopy – and 190 feet is actually quite good for a round canopy. For the record, we are very close to half a million descents using the LLP and it has never malfunctioned.

Bob Kershaw. We haven't said anything about heavy drop capability. Are we still in the business of delivering heavy weapons by air? – and can anyone else do it?

Loxton. That's an interesting one. The limiting factor at the moment is the C-130J which is not cleared for dropping Medium Stressed Platform – MSPs – so we can't do it right now, and neither can the Americans. We are currently limited to 1-ton loads, which is an issue, of course – it is being looked into, as is the A400M, which is not yet cleared for heavy loads. It is a problem, but we are not alone – there aren't many air forces able to drop MSPs at the moment. It's just not like it was back in the days of 5 Airborne Brigade ten or fifteen years ago.

Mike Meech. It seems to me that one of the lessons learned from WW II was that, in general terms, small drops were probably more successful than large drops. The Russian experience was similar. Nevertheless, after the war the Russians built up a significant parachute capability while we reduced ours. The Americans also maintained a significant parachute capability. By the 1980s it was more or less the case that, in the event of WW III, we would have inserted small teams probably using HALO – High Altitude Low Opening – techniques while the Americans were planning to mount large scale drops, all guns-blazing, with gunship helicopters in support. Quite different operational philosophies. Is that the same today?

Roger Annett. In the research that I have done on Burma in WW II and on Operation HERRICK in Afghanistan it is clear to me that today's Chinook has become yesterday's Dakota. It has a very similar capacity – even greater in terms of troops if they are standing up, which is the case in the RAF's Chinooks – but it has, of course, the great advantage of being able to land vertically. I think that this is one of the reasons why things have changed. With the Chinook you are able to mount all sorts of operations that could only have been done, if at all, by parachutists in the past. Wg Cdr Loxton made the point that a parachute capability is still there and it certainly has a use for certain limited operations, clandestine activities for example, but the Chinooks have actually delivered tens of thousands of soldiers – by air.

Sir Rupert Smith. Nevertheless, there is, I think, a confusion of concepts as to how one might use 'air' – the 'air flank' – on the

modern battlefield. Personally, having decided what I wanted to achieve, I found it best to analyse it under three headings. There was the use of air 'to battle' and its use 'into battle' – the difference being that the first was more of logistic consideration whereas the second involved delivering soldiers by parachute or helicopter or aircraft ready to fight – so they have to arrive fully armed and in combat formations so that they can go into action *immediately* – there is no time to 'sort things out'. Finally, there is the use of air 'in battle', by which I mean close air support by fixed wing aircraft and/or helicopters – like the Apache. The advantage of the helicopter is that it can be used almost like an armoured fighting vehicle, taking advantage of dead ground and so on. Once you begin to see the helicopter as a kind of tank, of course, you need to back it up with the equivalent of an armoured personnel carrier to support this vital air weapon system operating in what amounts to a terrestrial environment. That creates all manner of C2 problems as the machine switches back and forth between being an aeroplane and a tank – something that we haven't quite worked out yet. But whoever does work it out will have a battle-winning capability.

My apologies for that harangue – it's a hobby horse that I have been riding since the late 1980s.

Time to wind up I think. I, for one, and I think that I can speak for all of us, have had a most interesting day and I would like to thank all our speakers for their contributions. (*Applause*)

It says on the programme 'Closing Remarks', so I will make some. The first I have delivered already but there is still more to the business of learning to use the 'air flank'. I think that we can learn from the past that, if we want to 'manoeuvre', we need to consider 'reach', as in MARKET GARDEN, and achieving the right 'density' on the objective – as we did, or perhaps didn't do, on the flanks of the Normandy invasion. And it is always going to be a balance between the two. Reading between the lines of what we have heard today, you can sense the generals and air marshals of WW II trying to get the reach versus density equation right. The balance between them is relative, both to each other – and to your opponent's capability – and there is never an easy right answer.

And then there are the C2 issues. Who is going to be in command? Who is going to decide the balance between reach and density?

Should it be the air force – centrally controlled with assets directed to where they are needed? But, once committed, should it become a land force, which implies decentralised control? How do you effect that change – and when? We saw some aspects of this during the advance across northern Europe.

My last observation concerns the comparison between the armed forces of today and the situation when airborne forces were first introduced. In relative terms, compared to the other elements within the Army, airborne forces have been a growth industry ever since the early 1940s. The Parachute Regiment is a much larger proportion of today's infantry than it was when I joined the Army, as is the Army Air Corps, which is far more significant and, indeed, powerful than it used to be. And, albeit speaking as a soldier, I think that that is probably true of today's RAF as well, with helicopters and transport aircraft representing a far greater proportion of the front line, compared to combat types, than ever used to be the case. Which is interesting, isn't it? In short, airborne forces have been a considerable success story.

I have had a cracking day and with that, to use the jargon – 'Red On. Green On. Go!' – home.

A CORRECTION AND AN APOLGY

The photograph on page 66 of the Society's *Vulcan* publication is captioned as having been taken at Cottesmore. It actually shows four Vulcans of the Coningsby Wing (Nos 9, 12 and 35 Sqns) on the ORP at Wittering. The occasion was a press briefing hosted by the Air Minister, Mr Hugh Fraser, and AOCinC Bomber Command, Air Mshl Sir John Grandy, on 11 February 64 to publicise the capabilities of the V-Force, its successful switch to low-level ops and the introduction of BLUE STEEL.

The cartoon on page 112 of the same publication should have acknowledged the artist – Gary Weightman – an omission for which the Editor apologises.

BOOK REVIEWS

Note that the prices given below are those quoted by the publishers. In most cases a better deal can be obtained by buying on-line.

Exocet Falklands – The untold story of Special Forces Operations by Ewen Southby-Tailyour**.** Pen & Sword; 2014. £25.00.

Major Ewen Southby-Tailyour's name is already firmly associated with the Falkland Islands and with his authoritative accounts of many aspects of the 1982 war, notably the amphibious operations in which he played an important part. He writes with great authority on that conflict and this new book adds to his reputation. From start to finish, it is clearly and pleasingly written, at an early stage setting out the political background to the conflict and the strategic and tactical implications of the air-launched Exocet system.

Exocet Falklands presents a detailed description of plans to locate and destroy the Argentine Exocet capability on the ground. The significant threat posed to the Task Force by a handful of missiles was recognised at the outset of the conflict. In this 314-page book, with its 44 b/w plates and 14 maps, all of its implications are clearly set out, by way of context to the operational planning that went on in an attempt to eliminate it at source.

Ewen Southby-Tailyour skilfully paints a story of the planning and preparations to mount an air-landed assault on the Argentine Naval Air Base at Rio Grande, forward deployment airfield for the Argentine Super Étendard Exocet carriers, by the Special Forces Hercules of No 47 Squadron. More than once, the author dismisses this as an attempt by a glory-seeking SAS to replicate the Entebbe Raid in 1976. More generally, he is critical of avoidance of the command and control arrangements of Operation CORPORATE and of failures of planning caused, in his view, by excessive secrecy. Added to that, he points to what he describes as the neglect by planners to consult those who would have to execute the resultant missions. His criticism is unstinting and, in places, personal.

The mounting of Operation MIKADO, the air assault on Rio Grande, was to take place with the benefit of prior ground reconnaissance by patrols from the SAS, inserted by helicopter in Operation PLUM DUFF. He is lavish in his praise of the RN and RAF

aircrew involved in both operations. Equally, he describes in detail, and with justifiable admiration, the conduct of the Exocet attacks by the Argentine pilots and, similarly, the success of the Argentine Navy in achieving a working integration of Exocet and Super Étendard. The outcome of PLUM DUFF is well known and perhaps unsurprising and the book's assessment of the likelihood of success, had MIKADO been launched, is sobering.

Exocet Falklands is well worth reading, mainly for its careful account of the planning and part-execution of a suite of operations intended to take out the Exocet threat to the task force. However, eyebrows may be raised by the way in which the author's, otherwise faultless, account is flavoured by a great number of asides and *obiter dicta* in which inter-Service rivalries are ventilated. Many of these may reflect tensions then existing within the Special Forces community and will be of broadly passing interest to readers of this Journal. Others will be of more immediate interest to those of us, members of the Society, who will recognise the tones and black and white opinions of many Royal Air Force crewrooms! It may be sufficient to whet the would-be reader's appetite to quote a few lines from the final pages of the book:

> 'Among the Royal Air Force hierarchy (unlike the Special Forces Flight aircrew) lessons were there to be identified rather than learnt – and thus ignored or implemented as required.'

So there!

AVM Sandy Hunter

Observers and Navigators and other Non-Pilot Aircrew in the RFC, RNAS and RAF (2011 Edition) by Wing Commander C G Jefford. Grub Street; 2014. £40.00.

The original 2001 Edition of Jeff Jefford's book ended with the Air Force Board's decision to amalgamate all the non-pilot aircrew categories under the catch-all titles of Weapons Systems Officer (WSO) and Weapons Systems Operator (WSOp). Just a decade later the training of commissioned WSOs, ie navigators, was (precipitately, as events are now showing) terminated and the Navigator Branch effectively disbanded. A simple addendum to the 2001 Edition would have been a worthy addition to public knowledge. However, the

author has used the opportunity to considerably expand and refine the book.

At this point this reviewer needs to ‘nail his colours to the mast’. After navigator training in the early ‘70s he served four flying and three staff tours on the Buccaneer Force as an observer, navigator and QWI. His final flying tour was as the last OC the Air Navigation School at RAF Finningley (for just a fortnight) and the first OC the Navigator and Airman Aircrew School at RAF Cranwell.

On opening the 2011 Edition the quality of the production, when compared to the original edition, is immediately evident. Using a lighter, but better quality, paper has enabled an expansion from 273 to 401 pages, but without an excessive increase in size and weight. Not only has this permitted significant extra text to be added, but the photographs are generally larger and in all cases much clearer than before, and more have been added.

While on the staff of Finningley’s No 6 FTS in 1972, Jefford produced a monograph entitled *A history of basic Observer and Navigator training since 1914*, which took a chronological approach to the subject and provides the skeleton upon which this book is based. However, expanding the subject to include all non-pilot aircrew categories in the RFC, RNAS and RAF poses significant challenges in how to examine detail whilst retaining the overall thrust of the book. By structuring the book on the policy decisions of the various ministries and services he has been able to write a coherent narrative whilst still covering the specifics in detail. The chapters themselves are not strictly chronological, either internally or with respect to each other. However, to help the reader each chapter has been divided into sections on specific topics and these are listed in the comprehensive Contents pages at the start of the book.

Although not done in this second edition, the book can conveniently be broken down into epochs, the first of which is WW I. This is covered in Chapters 1 to 14 which address the evolution of the observer in terms of role, status and training within both the RFC and RNAS. Of note is the section on pages 32-33 dealing with the Bailhache Report of 1916 which recommended that ‘observers should receive promotion without having to become pilots and that a corps of observers be formed with a regular establishment graded for promotion among themselves.’ Jefford uses this as a theme throughout

the book and refers to it in the final sentence. On a lighter note, on page 53, he quotes from the evidence given to the Bailhache Committee by the DGMA, Sir David Henderson, when he stated that all observers can be recommended for a Flight Commander appointment (and thus promotion to captain) but that they can only be so appointed if they re-train as pilots, which could have come straight out of an episode of 'Yes Minister'.

The second epoch is the inter-war years and the early years of WW II in which the impact of the decisions of that period were felt. This is covered in Chapters 15 to 21. Chapters 15 and 16 have been significantly expanded to examine the decision to employ only part-time non-pilot aircrew, the impact of this in terms of the lack of emphasis on the art of air navigation, the eventual recognition of the problems caused and the reintroduction, in 1937, of the observer.

The third epoch, WW II from 1942 to 1945, is covered in Chapters 22 to 26, Chapter 27 covering mainly the twin-wing badge debate. This is a significant expansion on the first edition from 24 to 57 pages. The debates behind the creation of the new aircrew categories, especially that of the navigator, are covered in detail along with their selection, status and training. However, one has to refer back to Chapter 21 for a discussion of the evolution of wartime air navigation.

The fourth epoch is the Cold War, covered in Chapters 28 to 36 although Chapters 32 to 36 also contain post-Cold War details including discussion of the non-navigator aircrew trades. Chapter 28 is another significantly larger chapter than previously, dealing with the mercifully short-lived 1946 Aircrew Scheme. The main thrust of these chapters is the evolution of the role of the navigator in the fast jet and maritime patrol forces and the recognition of their professional equality with pilots. Perhaps because of his V-Force and training background Jeff has missed out a significant level of authority that experienced fast jet navigators had – that of being the Authorising Officer. In this case, and because there were no two-stick Buccaneers for the QFIs to hog, the most experienced staff navigators on No 237 OCU could find themselves authorising a student pilot, with just 1 hour on type, to fly as captain on an exercise on which they would themselves then fly with him as the instructor!

The post-Cold War epoch is covered in the latter part of Chapter 36 and most of Chapter 37. Here the lack of archival sources, except for

one RAF Personnel and Training Command briefing paper on the introduction of the WSO and WSOp categories, becomes apparent. For example, the 'further contraction of the RAF' referred to on p344 was actually the outcome of the 1994 Defence Costs Study and the disaggregation of fast-jet navigator training to three different bases was on cost grounds – Cranwell was simply a suitable base for the residual Dominies and Bulldogs. The impact was that those students came under the command of three different FTSs at four different times in their training and were not always seen at RAF Valley as having the same priority for flying hours as their pilot contemporaries.

That said, *Observers and Navigators* is the result of a most impressive piece of research. It is very readable, in terms of both style and structure, despite covering a vast range of topics. At one level it is a chronological history of the non-pilot aircrew branches. This is achieved through examining the operational requirements, the rapidly developing technology and issues of pay, status and culture. At another level it is a history of air navigation, air navigators and their training and employment. It is also a critique of military and political bureaucracies and their entrenched unwillingness to learn from their previous mistakes. Finally, it is a critical social history of the RFC and RAF. All modern air forces have a degree of bias towards pilots, and most camouflage it by issuing two-wing badges to non-pilot aircrew. Jeff concludes that the RFC and RAFs' particular institutional bias, signified by its retention of a single-winged flying badge, has been sustained and damaging. However, none of this detracts from the valour and professionalism of generations of non-pilot aircrew from WW I to the present day and beyond.

Gp Capt Chris Finn

Vulcan Boys by Tony Blackman. Grub Street; 2014. £20.

So now it's the turn of Vulcan crews to stroll down memory lane to join the swelling ranks of the 'Boys Brigades' of Buccaneer, Hunter and Victor men – watch this space for the Valiant. This 222-page hardback is pretty much what one would expect. Sixteen stand-alone essays on different aspects of the aeroplane's career as seen from various vantage points within the Vulcan community. What is unusual in this case is the considerable, and to this reviewer welcome, imbalance in favour of rear crew members, as distinct from pilots.

Pilots do have their say, of course, and there are contributions from an industry test pilot, as well as a standard issue RAF co-pilot who subsequently became a captain, running on to embrace Squadron and Station Commanders. Highlights, to me, were: two accounts, by the AEO and the flight test observer, of the abandoning of XA891 in 1959; the experience of participating in the SAC Bombing Competition from the point of view of a Nav Radar in 1966 and the Plotter, Jim Vinales, of the crew which won the Navigation Trophy in 1974; some less well-publicised aspects of Operation CORPORATE, including engineering issues, 'Monty' Montgomery's trials and tribulations while commanding the Vulcan Detachment on Ascension Island and David Castle's excellent account of the radar suppression missions, BLACK BUCKs 4, 5 and 6, including the diversion into Rio with just minutes of fuel left in the tanks. There is much more, of course, TACEVAL, RED FLAG, the RAF Detachment at Offutt AFB and the Vulcan's swan song as a stopgap tanker.

I spotted very few errors: unless special provisions applied at Waddington, it will have stood down from QRA with the rest of the V-Force from midnight on 30 June 1969 (not 31 December – p76); SACEUR stands for Supreme Allied Commander Europe (not Strategic Air Command Europe – p95); the edge of a cockpit is surely the coaming (not a combing – pp40 and 198) and a photograph on p35 has been printed upside down, but there are not enough of these wrinkles to cause concern.

For anyone who flew, or flew in, V-bombers this book will certainly ring some bells. Phil Leckenby's description of the clapped-out Morris J2s provided to transport crews on alert at Waddington (we had equally past their sell-by date Standard Vanguards at Scampton) is very amusing but was a classic example of a parsimonious air force coming very close to spoiling the QRA ship for a ha'porth of tar. Another example of parsimony was the RAF's refusal to pay the full 'duty rate' of mileage allowance for crews required to travel in order to fly from a different airfield, which clearly still rankles – as it does with me. Readers may recall that the difference between a claim on a F1771, as distinct from a F1651, was considerable – this reviewer had worn an RAF uniform for twelve years before he finally succeeded in persuading anyone to authorise one of the latter. Then again, the insensitivity of the Service bureaucracy is highlighted by two

members of the crews that brought home two of the trophies from the 1974 SAC Bombing Competition being handed on their arrival letters from the Air Secretary notifying them that their services would shortly no longer be required. But it's not all doom and gloom – there's Mel James' tales of the 'stolen' refrigerator at Wideawake and of his encounter with a 'Senegalese' policeman at Dakar (you will have to read the book), and Phil Leckenby's description of his (Australian) Nav Plotter 'losing it' in a spectacular fashion when he discovered that his watch had stopped which screwed up his painstakingly pre-calculated astro plan.

Recommended. It's not as much fun as the equivalent volume on the Buccaneer, of course, because Vulcans just aren't like that. But there is much to enjoy – especially if you are a V-force veteran.
CGJ

1 Group Bomber Command – An Operational Record by Chris Ward with Greg Harrison and Grzegorz Korcz. Pen & Sword, 2014. £25.00

Chris Ward continues to work his way through the histories of each of Bomber Command's Groups. Having already covered Nos 3, 4, 5 and 6, this latest volume deals with No 1 Gp. While there are some minor differences in style within the series, perhaps due to the influence of different collaborators, they have all been written to a similar format. What follows, therefore, inevitably draws heavily on the reviews of the books devoted to Nos 3 and 5 Gps that appeared in Journal 45.

This 330-page hardback sets out to present an account of Bomber Command's war as seen through the prism of No 1 Group's operations. It is presented in two parts, the second, and larger, part consisting of statistical facts: a list of AOCs with dates; a list of stations with dates of occupancy by individual squadrons; some basic numerical data – numbers of sorties flown, broken down by aircraft type, and selected records of the 'most bombing operations flown', 'most sorties flown' and 'highest percentage losses' variety. Each squadron is then dealt with in a similar fashion – COs, bases, statistical data and 'pecking order', in the sense that No 12 Sqn, for example, is noted as having flown the 22nd highest overall number of sorties in Bomber Command, the 14th (out of 59) highest number of

Lancaster sorties in Bomber Command and the 6th (out of 14) highest number of Lancaster sorties in 1 Group. There are more numbers like these, the exercise being repeated for the Wellington era, along with totals of operations (broken down as bombing, mining and 'other') and sorties flown, aircraft lost and percentage lost. All of this number-crunching is rounded off, for each squadron, with a list of every individual aircraft that it took on charge during WW II with a note on its fate/disposal. These numbers are remarkable; No 12 Sqn, for example, worked its way through no fewer than 97 Battles, 139 Wellingtons and 223 Lancasters.

The first part of the book is a chronological narrative which, in essence amplifies the annexed data, in that it records the comings and goings of COs and the movements and re-equipment of units, along with a varying amount of detail on the operations mounted and the losses sustained. The author acknowledges that much of the statistical data has been drawn from Middlebrook and Everitt's *Bomber Command War Diaries*. Similarly, the details of casualties will surely have been extracted from Bill Chorley's *Bomber Command Losses*, while much of the information relating to individual aeroplanes will have been derived from the publications of Air Britain. All of these sources feature in the bibliography but, oddly enough, this omits Webster and Frankland's official history.

No 1 Gp began its war by taking its Battles to France where it lost its identity to become the Advanced Air Striking Force. Nevertheless, the author does devote some space to this episode, but by page 9 we are already into 1941 with the group reconstituted in the UK and operating Wellingtons. The nature of the heavy bomber campaign makes it inevitable that from then on the narrative is desperately repetitive. I found it almost impossible to read without losing concentration – page after page tells the same story over and over again with only the dates and targets changing. If you have invested in any other volumes in the series you will, of course, find that much the same incidents crop up in each book and they are, again inevitably, described in very similar, often the same, terms – eg No 1 Gp did not mount the first of the '1,000 bomber' raids alone so each volume tells the same story. Repetition aside, in terms of syntax I have no complaints about the writing of this volume; I noticed only two typos and, unlike the earlier books, in this one the tale is broken down by

month, which makes it rather more user-friendly. My only serious reservation is that the book suffers badly from my personal bugbear, the ‘and his crew’ syndrome, which effectively consigns six out of every seven men to anonymity. That just seems (to me) to be at best overly casual and at worst so dismissive as to be disrespectful.

So is this book good, bad or indifferent? Well, like the others in the series it is good, in that, being based on reputable, albeit entirely secondary, sources (there are no references to ORBs in the bibliography), it is, I think, safe to assume that the annexed data will be reasonably accurate. But there is no really new information, and no attempt at analysis so no significant new conclusions emerge. Rather than, ‘is it any good?’ therefore, a better question might be ‘what is it for?’. This book is, in essence, an exercise in rearranging, collating and presenting dates, numbers and statistics. As such, the second half is a potentially useful, if somewhat esoteric, reference source, but my impression of the first half is of an oft-told tale told yet again. It all feels a bit ‘recycled’.

The other question, of course, is ‘should I buy it?’. Well, if you need to have readily available the sort of specialised information tabulated in the mega-annexes, then yes (although most of it is already available elsewhere). But not if you are looking for a new interpretation or a deeper understanding of the bomber offensive, because you will find that the narrative adds little in that respect.
CGJ

Covert Radar And Signals Interception by Peter Jackson and David Haysom. Pen & Sword; 2014. £19.99.

It gave me a great deal of pleasure to read this book because I had the privilege of knowing Eric Ackermann when we were both at RAF Watton in the early 1960s. He was then a senior member of the Central Signals Establishment (CSE) and I was the Junior Engineer Officer with No 51 Sqn, by then based at RAF Wyton but fully supported by the Installation Squadron within CSE at Watton. I never had the chance of knowing very much at all about Eric’s earlier experiences. This book has been a fascinating insight into a very wide and intensely interesting career.

Eric was closely involved in a wide variety of signals intercept and electronic warfare activities during WW II. That work started at the

Telecommunications Research Establishment (TRE) when it was located at Worth Matravers, near Swanage. As time passed, he flew as a Trials Officer and as an Observer with No 109 Sqn on many sorties over France and Germany. Some of these sorties were associated with the investigations into the German 'beams' leading to the successful counter-measures developed by TRE and operated by No 80 Wg. Flying over hostile territory on a frequent basis was the reason why Eric was commissioned in the RAF Volunteer Reserve, with effect from 11 September 1940. Other sorties over hostile territory were associated with the evolving enemy air defence system and its use of radar within the Kammhuber Line, delivering Ground Controlled Intercept instructions to night fighters. This work had material benefit to Bomber Command, which benefit would have been far better if Air Intelligence in London had not been such an obstruction to the dissemination of the information.

A partly saving grace was the presence of R V Jones as Assistant Director of Intelligence/Science (ADI/Sci) who had the ability and the authority to cut through red tape and embedded protocols based on previous policies. It seems that Ackermann became closely involved with 'RV', who appeared to use him as a roving investigator wherever there were scientific radio or radar problems. Chapter 3 of the book addresses Eric's extensive work in North Africa, with SIGINT collection and analysis. This is just one of the areas where available archives offer little support for his contribution to some major intelligence acquisitions. Readers who are well informed in this subject may question some of the assertions which are based on circumstantial evidence, but I would qualify that by saying that Eric's work was of a very secure nature and the available archives offer little illumination of his extensive career. I am comfortable accepting the statements by Aileen Clayton in her widely acknowledged book *The Enemy is Listening;* for example, where she describes Eric's work tracking German radar signals. The extent of Eric's reputation and achievement may be measured by the award of a George Medal, recorded in the *London Gazette* on 14 January 1944.

There are a number of factual errors which may exasperate a few readers, for example:

- Page 17: *Oboe* did not come into operational use in December 1941; the first *operational* use was on 20 December 1942;

the target was Lutterade and *Oboe* was used by Mosquitos of No 109 Sqn.

- Page 25: The radio signals that the book claims to have been detected 'in September 1939' were land-based, possibly from den Helder, and part of the German 'beam system' used for bombing raids; this site is mentioned later (at p35) as a Special Duty target. The reference to RV's book *Most Secret War* should have been more careful; the watch across the English Channel was actually from September 1940 (not 1939) and the *Admiral Graf Spee* did not sail through the Channel on her route to the South Atlantic. She left Wilhelmshaven on 21 August 1939 and sailed north along the Norwegian coast and then through the Iceland-Faroes gap.
- Page 53: The claim that Eric Ackermann was representing Air Intelligence DDI4 is unlikely. The appointment as AI4 Middle East at that time, based in Cairo, was a newly-arrived officer, Sqn Ldr Betton-Foster.
- Page 66: To say that Peenemünde was a 'launch site' seems to miss the point that it was the important design and development site for the V1 and the V2 weapons.

There is an interesting chapter on the subject of the flying bombs and the most sensitive mission to Poland to examine, and hopefully collect, debris that was available from German rocket test flights. Winston Churchill and the Crossbow Committee had fully engaged with the mission and secured the agreement of Stalin. The fact that Eric was part of that mission, at the direct instigation of RV, speaks to his capability and reputation. I would not challenge the suggestion that Eric was in the Missile Team because of his knowledge of radio directional beams (page 74), but it is quite erroneous to say that '[*this*] was how the flying bombs were sent on their way'. At that time we were quite clear about the guidance method for the V1, but we were uncertain about guidance for the V2. I make specific note of the BIG BEN sorties flown by 100 Group, conducted because the suspicion of radio guidance was high up on the list of options. The German *Wasserfall* rocket test-bed did have radio guidance and this was an unfortunate coincidence in time which led our assessment of V2 guidance astray for a while.

We then move into post-war and Cold War activities relating to SIGINT mainly from sites in Germany. One of the first tasks was to collect as much technical equipment as possible from German sources, as that would make an important contribution to British technical intelligence and research. Eric was in charge of an Air Scientific Research Unit that worked on that project, ultimately working again for RV.

That led on to extensive work with the evolving special intelligence collection sites along the border with the Warsaw Pact, mainly based with No 646 Signals Unit at Obernkirchen. No 646 SU and the other ground stations in the chain collected tactical and strategic SIGINT on a continuous basis; as is noted later in the book (page 143), airborne signals collection was transient. The original reference by Professor Aldrich (page 139) that 'Tactical Sigint in peacetime presented a problem . . .' was itself derived from earlier archives in February 1946 (see TNA Air 40/2591) and was quite valid when it was first written by the Air Ministry DD of Sigs(B); but it related to an early post-war period when the Cold War had not really started. That changed after the Berlin Blockade in 1948. In order to protect the expanding ground-based intercept activity as the Cold War evolved, the whole endeavour was under the deepest cover. Almost certainly, outside of SIGINT channels, there would be no direct attribution as to the source site, which always remained anonymous. Sadly there is very little detail in the book about the specific achievements of No 646 SU. Knowledge of that material may well still exist, but not in the public domain. The vital, overarching principle was to protect how we knew what we knew. People such as Eric Ackermann would have contributed to the technical solutions, equipment specifications and installations and their operation.

Chapters 9, 10 and 11 cover the Cold War period, but they are related to more administrative, domestic and family matters. During that period, Ackermann was promoted to wing commander and became OC 646 SU. However, I do note that within The National Archives some folders that would have had potential interest and value are marked as 'Not Available' because of water damage and asbestos contamination; I found that curious and perhaps expedient.

Eric returned to the UK in 1959 when he was posted to RAF Watton, working with CSE and No 51 Sqn. He retired from the RAF

and continued working with CSE as a member of the Scientific Civil Service. I do feel that the records of CSE may well have yielded more information about Eric, but I must again note that it is a very sad fact that many records of CSE were destroyed only a few years ago as a consequence of cost-savings at RAF Waddington. I would wonder, even now, if any retained records of meetings, etc, perhaps within the Air Historical Branch archives, could have better illuminated work by CSE and No 51 Sqn with which Eric was involved.

Eric Ackermann left CSE in 1965 to become the Head of the Military Satellite Communications Group within the MoD Defence Signals Research and Development Establishment, in the early stages of the British Skynet military communications programme. He subsequently accepted an appointment to the British Embassy in Washington DC in 1967; and then with US Communications Satellite Corporation from which he finally retired in 1984. Sadly he died on 27 April 1986, aged only 66.

My overall opinion of this book is that it is very good, but I believe that a work of this nature should, wherever possible, have footnotes to clarify matters of fact and to cite sources, as they provide the reader with a degree of confidence in the information provided. Here, they are lacking. That said, while the book does contain a good many assertions, circumstantial claims and some errors of fact, it is, nevertheless, a remarkable reconstruction of the extensive and quite exceptional career of Eric Ackermann GM. I applaud the authors for their efforts in unearthing the material that helped to create the narrative.

Wg Cdr John Stubbington

My Secret Falklands War by Sidney Edwards. Book Guild Publishing, 2014. £7.99.

The story of Group Captain Sid Edwards's role in the Falklands War may only now be told, the baulk period of the so called 'Thirty Year Rule' having expired. On Easter Sunday 1982 his old friend ACAS Ops, the then AVM Ken Hayr, secured his appointment as 'a direct military link' between the United Kingdom and Chile. His account of his dispatch to Santiago after a couple of days of intensive briefing and of his activities in Chile casts light on aspects of the war which have long been the subject of rumour and speculation.

Edwards's selection for these 'special covert duties' was due, he was assured, not merely to his friendship with the air marshal, with whom he had been a flight cadet, a member of the same Cranwell entry and Hunter pilot. He had diplomatic and intelligence experience and, critically, had served as Air Attaché in Madrid. Clearly, this 'network' made for a smooth working relationship with his boss. His acceptability to the Ambassador in Santiago was assured by a splendid report on his qualities from the Permanent Under Secretary at the Foreign Office. By his own account, his excellent Spanish and background as a Hunter pilot made for easy acceptance by the hierarchy of the Chilean Air Force.

A detailed review of a slim volume of this sort, just 96 pages, including 10 b/w plates and 7 maps, risks spoiling the surprises it contains. Suffice it to say that the author recounts, with a mixture of pride and admiration, his cooperation with the Chilean Air Force for which he has an understandably high regard. His account in particular of the mounting of Nimrod R1 ELINT sorties from Chilean soil, the use of RAF Hercules in Chilean markings and the hugely important sharing of air defence information with the Task Force makes compelling reading. That a British portable radar and associated communications were established in short order in southern Chile to supplement cover from the Chilean radar at Punto Arenas is testimony to his personal success – and to the agility of the UK MoD in 1982, a sentiment not always associated with that august institution!

Group Captain Edwards highlights difficulties of excessive security as, for example, when Air Marshal Hayr had not known in advance of the aborted SAS reconnaissance of Rio Grande air base which required explanation to the Chilean authorities and to the media. In another incident, a failure by the Chilean air defence organisation to recognise the Nimrod R1 sorties as 'friendly' resulted in an interception and could have led to the downing of the aircraft.

Throughout the book, the author's admiration for his fellow flight cadet knows no bounds. On one occasion he writes that '[*Ken*] was a great leader, but also a very kind and thoughtful man.' Later, at the time of the interception of the Nimrod by Chilean fighters, he noted that 'Ken was quite agitated', an aspect of his talented mentor not unknown to others of us who once worked for him! His own contribution to the successful outcome of the Falklands War was

clearly significant, as reflected in his account of the rapturous welcome he received at the highest level on his return from Santiago. Whether his conclusion is valid that, without the help of Chile the war would have been lost, is for the reader to decide. Edwards's book is easily read and worth reading.

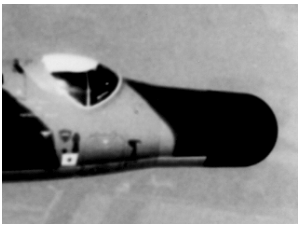
AVM Sandy Hunter

Listening In by Dave Forster and Chris Gibson. Hikoki Publications; 2014. £29.95.

This book's sub-title, *RAF Electronic Intelligence Gathering Since 1945*, pretty well sums up its content, although I would have inserted 'airborne' after 'RAF'. There are incidental references to sundry ground-based signals units but the focus here is on the use of aeroplanes. It is, in short, an account of the activities of the Central Signals Establishment (CSE) and Nos 192 and 51 Sqns – and it is the first serious attempt to chronicle their work.

Listening In is a handsome 192-page A4 hardback and the fact that it is a Hikoki publication certifies the quality of the reproduction of the 100+ informatively-captioned photographs. These include pictures of (probably) every individual Lincoln, Washington, Comet, Canberra and Nimrod used by the units concerned and these are further amplified by precise side elevation line drawings indicating the locations of the various aerials that were sported as the electronic fits evolved. Because the activities of No 51 Sqn have been classified one has always been curious about what was hidden behind these subtly changing lumps and bumps and this book answers many of these questions. Along the way we learn a great deal about the development of the intelligence gathering equipment and the problems that needed to be overcome. In the early days, for instance, there was no D/F capability and when it did begin to materialise there were problems over its accuracy which took time – years – to overcome.

I cannot claim to be an expert in this field – by its nature, few people can – but only two points caused me to raise an eyebrow. One of the oddities about some of No 51 Sqn's Canberras was that they were unique in having a white panel in the roof of the cockpit blister. A caption on page 129 says that this was a sunshade, 'essential for high-altitude and tropical operations . . .' Since the Canberra was operated globally under such conditions by many air forces for more



The 'sunshade' that appears to have been a unique feature of No 51 Sqn's Canberras.

than half a century, indeed the RAF flew Canberras from Singapore (less than 90 miles from the equator) for fifteen years, and all of them without providing such sunshades, I found this rationale a little unconvincing, even disappointing; I had been hoping for something far more exotically 'electronic'. The second query concerns the book's date of 1 November 1951 for the formation of Nos 192 and 199 Sqns, which is odd as it is about four months later than most other references.[1]

These minor issues aside, the authors provide extensive detail of the sorties flown, including in many cases, maps showing notional routes. This information is not confined to the classic north-west European Cold War and embraces, for instance, the Middle East (confirming the oft-rumoured employment of Washingtons in the context of the Suez crisis), the Gulf and the Far East, notably during the Indonesian Confrontation of the 1960s. Along the way we are given a lot of insight into the degree of political control that was exercised over these activities, as it was sometimes necessary to cancel, or modify, a sortie in order to avoid, or minimise the risk of, provoking an incident which might exacerbate an already tense international situation or disrupt diplomatic negotiations. There was a lot more politics involved in the equipment programme, leading to repeated struggles over the provision of appropriate aeroplanes. These were invariably won by virtue of the value and quality of the technical information being derived and the fact that our ability to pool this with the Americans gave us access to their, much larger, intelligence take.

The capabilities, and limitations, of the aeroplanes that the RAF was obliged to use for this very specialised role are well described although, and unsurprisingly, the detail does become less comprehensive in the Nimrod era. While the Nimrod was a satisfactory platform, the RAF had always hankered for something even larger and at various times had considered the Vickers V.1000, adaptations of the VC10 and had first contemplated adopting the Boeing 707 as long ago as 1962 – fifty years before it acquired the RC-135W Rivet Joint.

There will be more to tell about the later operations flown by

No 51 Sqn but *Listening In* has revealed a great deal about the conduct of airborne electronic intelligence gathering into the 1980s and provides some insight into more recent years. Much of this will be new to most readers. Strongly recommended.
CGJ

A History of the Mediterranean Air War 1940-1945, Vol 2 by Christopher Shores and Giovanni Massimello with Russell Guest, Fank Olnyk and Winfried Bock. Grub Street; 2014. £50.00.

This, the second of, what is projected to be, a seven-volume series, opens with the *Afrika Korps*, having already retaken Cyrenaica, establishing itself at Gazala in February 1942 and ends with the Battle of Mareth in March 1943. As the lengthy list of authors indicates, while Chris Shores is an acknowledged expert on wartime British aviation, and this is his project, he has drawn heavily on the expertise of collaborators who are specialists in the exploits of the Italian, German and American air services. The result is as comprehensive an account of day-to-day operations as is ever likely to appear in print.

Graham Pitchfork gave the first volume an enthusiastic review in Journal 54 and I fully endorse his opinion. That includes an observation to the effect that, while the book sets out to provide an account of all aspects of the war in the air, it still feels a little like *Fighters Over the Desert* plus some extra bits. There are certainly chapters focusing on heavy bomber and maritime operations but these feel comparatively superficial, as they lack the fine detail devoted to describing fighter engagements and the many personal recollections provided to amplify the actions of individual fighter pilots. This imbalance is most marked when it comes to identifying individuals. The occupants of the back seats of Beaufighters are named; anyone other than the pilot of any other multi-seat aeroplane is simply lumped together anonymously as ‘and crew’.

The structure of the content is strictly chronological, each day’s combat claims and actual losses are tabulated, by air force, providing detail such as the unit, the pilot’s name and aircraft type along with, where known (and in most cases it is), the aircraft’s serial number, the time and location of the claim/loss and a brief note on what happened. Where appropriate (and again, in most cases it is) there is a narrative description of the day’s activities, sometimes running to several pages

and sometimes including comments on the introduction of tactical innovations, mistakes made, lessons learned and so on. The meticulous international research has permitted the majority of claims and losses to be reconciled, highlighting, once again, the inherent optimism of all fighter pilots. To take just one example, on 3 June South African pilots claimed to have shot down ten Ju 87s whereas the Germans lost only four while the Germans claimed ten P-40s versus actual losses of only five. The claims will all have been made in good faith, of course, but this is far from being an isolated case and the tabulation of *all* claims provides scope for some interesting revisions of reputations.

This is a densely written doorstop of a book and it contains such a huge amount of information that the occasional mistake is almost inevitable and a close reading of the text does reveals a few slips, for example: on p34 the entry for the loss of Lt Biden's SAAF Hurricane has been duplicated at the expense of the details relating to Lt Finney who was shot down in the same engagement; an entry for 'British Claims' on 23 March 1943 (p549) appears to have been omitted; the Zwichy pump on p568 should be a Zwicky pump; the 'British Claim' on 7/8 June, tabulated on p658 is actually a 'British Casualty'; and on p660 the move of '79 Sqn to LG140' on 5 February 1942 should read '70 Sqn to LG104'. There is one anomaly that is a little difficult to rationalise away; on p89 the calibre of the tankbuster Hurricane's cannon is stated, correctly, to be 40mm, but on p390 and p450 it is 37mm. But in 736 (yes – 736!) closely typeset pages the incidence of inaccuracy is remarkably low, and such problems as do occur are pretty obvious because most are in the nature of oversights or typos rather than being factual errors.

The illustrations are as impressive as the written content. There are more than 100 informatively captioned photographs in the first 300 pages – I stopped counting after that. Some will be familiar but many, possibly most, are being reproduced for the first time, certainly in an English language publication. The quality varies, of course, reflecting the quality of the original wartime image, but the reproduction in all cases is first rate.

The book is rounded off with a really comprehensive index permitting the reader to find all references to every named individual (so no bomber navs or gunners) broken down by nationality, every

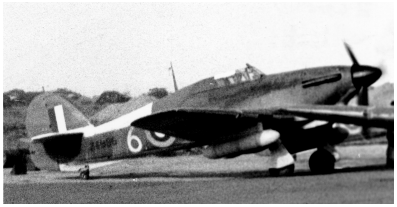
unit broken down by air service and every location. All of which makes the book extremely user friendly as a work of reference.

Strongly recommended. A *tour de force* – only five more to go . . . **CGJ**

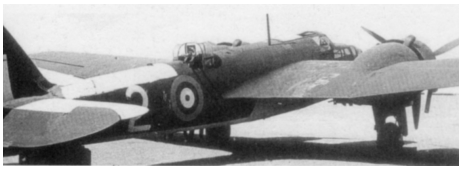
[1] The primary source documents for the key dates governing unit formations, disbandments, renumberings and the like are the Secret Organisation Memoranda published in the SD155. SD155 No 280/51 states that Nos 192 and 199 Sqns were to form at Watton on 15 July 1951 (AIR10/5471). That said, while it is not disputed that the F540 for CSE (AIR29/2161) does record the formation of the two squadrons with effect from 1 November 1951, it is evident that local record keeping left something to be desired. It is, for instance, January 1952 before the squadrons begin to appear on the distribution lists of correspondence being generated at Watton and it is not until then that the two squadrons appear to have begun to maintain ORBs of their own. The waters are further muddied by the fact that, notwithstanding CSE's date of November, the Air Staff at Medmenham had been referring to Nos 192 and 199 Sqns in HQ 90 Gp's ORB since mid-September (and possibly earlier). Perhaps the cloak of secrecy within the signals intelligence community was such that no one really knew what was going on! While 1 November certainly appears to have been the *de facto* date at unit level, unlikely as it may seem in our tiny 21st Century RAF, it is just possible that those missing four months could become crucial in any future dispute over relative seniority between units and 15 July really should be acknowledged. It is, incidentally, the date recognised by AHB. **Ed**

Postscript

This note is offered simply as an observation which may be of some interest, not as a criticism. On page 98 of *A History of the Mediterranean Air War, Vol 2* there is photograph of a Spitfire V captioned '. . . which carries a single number […] prior to receiving squadron code letters'. It also has the top of its rear fuselage painted white, but this attracts no comment. These high-visibility marking actually indicate that the aeroplane was one of more than 700 Spitfires that reached Egypt by being flown in stages across central Africa from Takoradi to Khartoum then down the Nile valley to Cairo. This was usually done in batches of half-a-dozen or so with a Blenheim providing navigation.



Above, Hurricanes, and below, Blenheim escorts wearing the temporary white tailplane, top decking and single flight number applied to aeroplanes using the trans-Africa ferry route.



ROYAL AIR FORCE HISTORICAL SOCIETY

The Royal Air Force has been in existence for more than ninety years; the study of its history is deepening, and continues to be the subject of published works of consequence. Fresh attention is being given to the strategic assumptions under which military air power was first created and which largely determined policy and operations in both World Wars, the interwar period, and in the era of Cold War tension. Material dealing with post-war history is now becoming available under the 30-year rule. These studies are important to academic historians and to the present and future members of the RAF.

The RAF Historical Society was formed in 1986 to provide a focus for interest in the history of the RAF. It does so by providing a setting for lectures and seminars in which those interested in the history of the Service have the opportunity to meet those who participated in the evolution and implementation of policy. The Society believes that these events make an important contribution to the permanent record.

The Society normally holds three lectures or seminars a year in London, with occasional events in other parts of the country. Transcripts of lectures and seminars are published in the Journal of the RAF Historical Society, which is distributed free of charge to members. Individual membership is open to all with an interest in RAF history, whether or not they were in the Service. Although the Society has the approval of the Air Force Board, it is entirely self-financing.

Membership of the Society costs £18 per annum and further details may be obtained from the Membership Secretary, Wg Cdr Colin Cummings, October House, Yelvertoft, NN6 6LF. Tel: 01788 822124.

THE TWO AIR FORCES AWARD

In 1996 the Royal Air Force Historical Society established, in collaboration with its American sister organisation, the Air Force Historical Foundation, the *Two Air Forces Award*, which was to be presented annually on each side of the Atlantic in recognition of outstanding academic work by a serving officer or airman. The British winners have been:

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THE AIR LEAGUE GOLD MEDAL

On 11 February 1998 the Air League presented the Royal Air Force Historical Society with a Gold Medal in recognition of the Society's achievements in recording aspects of the evolution of British air power and thus realising one of the aims of the League. The Executive Committee decided that the medal should be awarded periodically to a nominal holder (it actually resides at the Royal Air Force Club, where it is on display) who was to be an individual who had made a particularly significant contribution to the conduct of the Society's affairs. Holders to date have been:

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