ROYAL AIR FORCE

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ROYAL AIR FORCE HISTORICAL SOCIETY

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**Ex Officio*

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SELECTED ABBREVIATIONS

ABM	Anti-Ballistic Missile
ACAS(Int)	Assistant Chief of the Air Staff (Intelligence)
ADI(K),	Assistant Directorate of Intelligence (K)
AI	Air Intelligence
ASW	Anti-Submarine Warfare
CAS	Chief of the Air Staff
CDS	Chief of the Defence Staff
CIGS	Chief of the Imperial General Staff
DD	Deputy Director(ate)
DF	Direction Finding
DCAS	Deputy Chief of the Air Staff
DZ	Drop/Dropping Zone
FEAF	Far East Air Force
FINRAE	Ferranti Inertial Rapid Alignment Equipment
HUD	Head Up Display
IFF	Identification Friend or Foe
MA	Military Intelligence
QRA	Quick Reaction Alert
SACEUR	Supreme Allied Commander Europe
SACLANT	Supreme Allied Commander Atlantic
SAM	Surface-to-Air Missile
SIS	Secret Intelligence Service
SOE	Special Operations Executive
VCAS	Vice Chief of the Air Staff

EDITOR'S NOTE

The established cycle that determines the content of our Journals means that the edition which appears in or about January of each year reflects the proceedings of the event held in the previous spring which it does by publishing the papers read on that occasion.

In 2007, however, we interrupted the usual sequence by sponsoring, instead of the usual seminar, a visit to the recently opened National Cold War Exhibition at the RAF Museum's Cosford site. While those who attended were treated to some presentations, they were to do with the design and operation of the splendid new building and the preparation of the displays. In other words, while interesting in their own right, they were not to do with RAF history *per se*. That created something of a problem as we would either have to skip an edition or find something else to print. Your Committee decided that we could usefully fill the gap by reprinting some of the more significant papers that were read to the Society in its early days and which appeared in publications that are no longer readily available.

ERRATA

Anthony Furse has pointed out an error on page 11 of Journal 40 where it says that Newall was CAS in December 1940. Newall had, of course, been succeeded by Portal in October.

Tim Wingham has noted an error in the caption to the photograph of HSL 2550 on page 57 of Journal 40. He points out that those are not 'twin Lewis guns on pillar mountings' as stated; they are Vickers 0.303 inch Gas Operated Mk 1, No 1s *aka* Vickers Class Ks, or VGOs for short. As Tim says, when 'presented with a picture of a drum-fed machine-gun in an RAF setting, the immediate assumption is – Lewis gun.' I plead guilty as charged. That was my caption, so *mea culpa*. **Ed**.

RAF HISTORICAL SOCIETY INAUGURAL LECTURE
20 OCTOBER 1986

The Society's inaugural lecture was given by Professor R V Jones, CB, CBE, FRS, author of *Most Secret War,* the account of British Scientific Intelligence during the 1939-1945 war, published in 1978, serialised in the *Sunday Telegraph* and used as the basis for the television series *The Secret War.* Introducing Professor Jones, Air Commodore Probert said:

'In introducing this evening's lecturer I'd like to take your minds back to the middle 1930s, the time when – according to some – the RAF was doing so little to prepare to meet the German threat. The facts are rather different for, as John Terraine has recently reminded us in *The Right of the Line,* those years witnessed a silent, almost unseen, transformation.

It was Professor Blackett, in his 1960 Tizard Memorial Lecture, who pointed out so clearly that one aspect of this transformation was the growing intimacy between senior officers of the armed forces and the scientists in the government research establishments. It stemmed primarily, of course, from the formation in 1935 of the Committee for the Scientific Survey of Air Defence, and R V Jones was one of the young scientists who came to work for the Air Ministry at that time. Incredible as it now seems, by 1940 his field of research led to his being summoned to attend a meeting of the Cabinet on the subject of the German beams – at the tender age of twenty-eight!

Throughout the rest of the war he was closely involved in almost every aspect of intelligence, including Ultra, and nobody is now better placed to talk to us from personal experience about the RAF and the intelligence war. Moreover, 'RV' addresses us this evening, not as a guest, but as a fully paid-up founder member of our Society!'

THE INTELLIGENCE WAR ANDTHE ROYAL AIR FORCE

by Professor R V Jones CB CBE FRS

In the frantic decade of the thirties, when some of us were doing all we could to tackle the problems of air defence, Professor Lindemann once told me that he had written to the Air Ministry accusing it of taking so much time to do anything that it must be attempting to emulate the Deity to whom we sang 'A thousand ages in thy sight are as an evening gone'. On that scale the sixty-eight years since the creation of the Royal Air Force would seem as a minute or less in the long cavalcade of human history; but they have seen more spectacular advances in knowledge and technology than had occurred in the entire preceding span of historical time. Jet engines, supersonic flight, radar, television, computers, guided missiles, atomic bombs, artificial satellites and interplanetary probes have all come into being since the Royal Air Force was formed; and it has had to evolve with them through the most intense period of technological development the world has yet known.

So whatever the history of the Royal Air Force may lack in duration is much more than compensated by the range and scale of its activities, both technological and operational, and by its vital part in the momentous battles of the Second World War. It is, therefore, entirely opportune that this history is now to be recognised by the formation of the Royal Air Force Historical Society, and it will be gratifying to all of us who served in Intelligence that the Society has chosen for the subject of its first lecture the relations between the Royal Air Force and Intelligence.

The title of the lecture incorporates more than one ambiguity when it refers to 'the intelligence war', even if we confine the context to World War II. Does it mean the war between the British and German intelligence services? Or might it refer to the struggle that sometimes occurred between the intelligence branches of the three Services; for example, in getting the highest priority in the cryptographic effort at Bletchley? Or to that other war that broke out from time to time between the intelligence and operational branches, when the operators found intelligence assessments of their success too low to be palatable?

If that were not enough, we in Intelligence occasionally found

ourselves in dispute with some of the leading experts in the country regarding the interpretation of evidence concerning new German weapons; for example, in the weight of the V2, of which an American witness, Professor W W Rostow, wrote 'Although I was at that time relatively young (27), I had acquired some experience with both academic and governmental bureaucratic structures and their capacity for bloodless tribal warfare. But I had never been present at, let alone presided over, a meeting charged with more emotional tension than that centred on the weight of the V2 warhead'.

A further interpretation of our title might point to the part played by the Royal Air Force, not in *using* intelligence, but in gathering information which was to be collated with that obtained from other sources to build up the intelligence assessments of our opponents' intentions.

What I shall have to say will probably draw on experiences in all these aspects, not primarily in reminiscence but in the belief, with Dionysius of Halicarnassus, that 'history is philosophy teaching through examples'. At the same time, some degree of reminiscence will be inevitable, if only to express an appreciation of some of the personalities involved.

My own contact with Air Intelligence started in 1938, and I became regularly involved from September 1939 onwards. The main objects of pre-war intelligence were the size and technical capabilities of the various branches of the *Luftwaffe*, and of its bomber component in particular. On estimates of size from 1935 onwards the Air Ministry found itself in conflict with other bodies, including Winston Churchill, who contended that its estimates were too low. This was, in fact, true up to September 1939, when Air Intelligence began to over-estimate; for example by one-third in the numbers of the German long-range bomber force. Some of us can remember the fantastic official predictions for the numbers of casualties to be expected in London in the first week of the war. Frank Inglis, who as DDI3 was head of the German branch of Air Intelligence early in the war, told me how the prediction had originated. He had been asked, at very short notice, for an estimate of how great the casualties might be and so he assumed that every available German bomber might be employed on a round-the-clock programme, allowing only enough time between sorties to be re-armed and re-fuelled. He realised that this would result in a wild

over-estimate of what would probably happen and had not expected any rational being to take it seriously; he had merely supplied an answer which matched an irresponsibly posed question.

It was interesting to watch the change of positions in the first two years of the war. Churchill, who before the war had challenged the Air Intelligence figures as being too low, now began, prompted by Lindemann, to challenge them as being too high; one of the key points being the fighting strength of a *Staffel*, which Air Intelligence held to be twelve, whereas Lindemann was for nine with three in reserve. The controversy resulted in a judge, Mr Justice Singleton, being appointed in December 1940 to settle it. I was summoned to his Inquiry, the erroneous impression having gone around that I was an expert on the size of the *Luftwaffe*. I managed to avoid embarrassment by telling the judge that I was no such expert, but might be able to help him in one way, which was to give an opinion of the reliability of the various sources of evidence that would be laid before him, based on the experiences that I had had with *Knickebein* and the other beams. Quite the most reliable source for numbers, I told him, had been the Y Service (now Sigint) records of the W/T call-signs of individual aircraft. An enormous amount of painstaking observation and recording must have been undertaken by the call-sign section of what was then called DDSigsY, under Gp Capt L F Blandy. Time after time, when I asked Flt Lt Maggs, the head of the section, whether he had any trace of a particular call-sign, he was able to tell me when the aircraft had been heard and the airfield with which it had been in contact. The Singleton Report noted that the Y Service coverage of call-signs of the long-range bomber force was as high as eighty to ninety per cent. Lindemann, too, gave the Y Service evidence great weight; and the final assessment justified his original challenge which reduced the estimate of German front-line strength by a quarter.

While such estimates involved the collation of evidence from different types of source, which was the prime function of many of the branches in the Air Intelligence Directorates, the call-sign evidence also illustrated another area of Air Intelligence; this was to collect raw information for itself. Apart from what it might receive from secret agents via MI6 it could, of course, draw on reports from Air Attachés and on whatever might be available in the press. But, particularly in war, other channels of information could be opened up; photographic

reconnaissance, electronic reconnaissance, prisoner interrogation and captured equipment could all provide valuable evidence and would require specialist staffs with air force and kindred personnel to operate and exploit them. And in the case of World War II, the Royal Air Force had another direct part to play in the hazardous ferrying of agents into and out of German-occupied territory. Let us look briefly at these activities in turn.

As regards *pre-war* secret agents, they produced very little for scientific and technical intelligence before 1940. One telling failure in this respect was the absence of any report of the erection of two massive and remarkable radio structures, one at Schleswig-Holstein and the other near Cleves, only a few miles from the Dutch border, which were the *Knickebein* beam antennae, a hundred feet high and mounted on turntables three hundred feet across. As the war progressed, of course, there were new opportunities for MI6 in encouraging and working with the resistance organisations which developed in the occupied territories. In *Most Secret War* I gave a few examples of the bravery of the men and women of the Resistance; and as a result of the book being published I have learnt of further examples, and of the identities of individuals whose stories I told but whose names I did not know; the Belgian agent, for example, whose reconnaissance report of German radar stations ended with an emphasis of their importance which he illustrated by the vigilance of the sentries who had shot at him, 'fortunately', he said, 'with more zeal than accuracy'. He went on, 'As far as our work is concerned, it would be helpful if we knew to what extent you and the British Services are interested. We have been working so long in the dark that any reaction from London about our work would be welcome to such obscure workers as ourselves. We hope this will not be resented since, whatever may happen, we assure you of our utmost devotion and the sacrifice of our lives.' One of the Belgian resistance organisations has since identified the writer as a thirty-year old doctor, André Mathy, who was later captured by the Germans and executed on 21 June 1944 at Halle after more than a year as a prisoner; he had kept his word to the last.

Another gallant episode which only came to light after my book was published involved a Frenchman, Pierre Julitte. A member of de Gaulle's staff, he had joined the Resistance, and was captured by the

Gestapo in March, 1943. He then spent the next twenty-five months in prisons and concentration camps, including Buchenwald and Dore. At Buchenwald he and his comrades realised that what they were being made to work on were the V-weapons, and they managed to get a message out recommending that the factory, in which they themselves might well be working, should be attacked. On 24 August 1944, he said, it was indeed bombed. At first I wondered whether his story could be true, for there was no trace of such an attack either in Basil Collier's *The Defence of The United Kingdom* or General Dornberger's *V-2* nor in *The Rocket Team by* Ordway and Sharp. Fortunately, I asked Air Cdre Probert at AHB whether there was anything in the records that might confirm the story because, although in his book Pierre Julitte had changed the names of all the characters involved (he afterwards told me that he wanted to tell a truthful story but did not want to identify individuals who had behaved badly), his account rang true. And indeed this turned out to be the case, for the Air Staff Operational Summary for 25 August recorded that, on the previous day, 128 Flying Fortresses had attacked 'an armaments factory' at Buchenwald with 'excellent results' which were later detailed as 'severe damage to nearly every major building', including some of the barracks in the concentration camp. Julitte and his immediate colleagues survived, but they could well have been among the many who did not.

Such sacrifices are rarely recorded in official histories, partly through the difficulty of historians getting near enough to the evidence, particularly when, as in this instance, there is no clue to the underlying truth in the bald statements of operational summaries. I am reminded of Lord Slim's book, *Unofficial History*, where he begins each chapter with a statement from the official History of Military Operations in World War I and then spends the whole chapter describing what actually happened from his own direct involvement in the episode concerned. And I know how he felt because of my own experience in the Baedeker raids of 1942, where the Official History merely records that, after 4 May, 'almost everything went wrong for the attackers'. The main thing that went wrong was that their percentage of bombs on target fell from about 50% to 13%, thanks to our introduction of supersonic jamming of the X-beams. How we knew that supersonic jamming would be needed, how we prepared for

it but failed to use it for the first fatal fortnight, was a story that merited a chapter in itself.

Actually, official historians are not to be blamed if the relevant information is not available to them or when time does not permit them to ferret it out. I am reminded of this point in connection with reports from the Resistance that sometimes failed to get through to us in London. Thanks again to the publicity arising from *Most Secret War,* one or two of these have now come to me, in particular from General Pomes Barrere of the *Deuxième Bureau*, who had sent in reports on the V-weapons in 1943 and 1944 which would undoubtedly have been helpful had they reached us at the time. There were probably many such instances, some of which were due to some intermediate official not realising the importance of sending the reports on, incomprehensible to him though they might have seemed.

No such problem affected photographic reconnaissance, which was the unique contribution of the Royal Air Force to the intelligence war. It owed much to the enterprise and technical skill of Sidney Cotton whom his successor, Geoffrey Tuttle, described to me as the greatest leader he had known. Since I have described my own relations with photo-reconnaissance in some detail in *Most Secret War*, I will say little more here beyond repeating my admiration for the outstanding work that was done at all levels, both by the pilots and by the interpreters and also by the army of men and women who processed the photographs – those whose work, in Lord Slim's words, usually only comes to notice when something for which they are responsible has gone wrong.

This was equally true of another service for which the Royal Air Force was directly responsible, that of the radio intercept operators who listened to German radio signals and had to spend long hours taking down streams of Morse characters whose significance was to them quite unintelligible and yet whose accurate recording was essential if the cryptographers were to have any success in deciphering them. It was rather better for those operators who had to record the radio-telephone messages between, for example, German night fighters and their ground control stations, because once we had worked out the significance of various calls such as 'Emil Emil' or 'Rolf Lise' it was possible to listen to the activities of the German night defences against our bombers almost as though we were in a

ringside seat. But it was a strain, all the same.

Cryptography, of course, deserves far more than a lecture to itself, even at the tactical level where codes were relatively easy to break. Curiously, not so much has been told of the work at this level, beyond Aileen Clayton's excellent book *The Enemy is Listening.* As regards cryptography at the then highest level, Gordon Welchman has given a detailed account in *The Hut* 6 *Story* which has been supplemented by a posthumous paper earlier this year (ie 1986 **Ed**) in *Intelligence and National Security.* In this latter he pays a more adequate tribute to the work of the Poles who, in 1939, were substantially ahead of us in breaking Enigma and who handed over their work, including reconstructions of actual Enigma machines.

Let me say rather more about the Poles, for not only did they lead the way, but they succeeded in covering their tracks on leaving Warsaw when it was being overrun by the Germans. They escaped via Rumania to France and by the end of October 1939 they had started to work again on German cyphers in Paris. On the collapse of Northern France, they moved to a site in Vichy France, but finally that too became untenable when the Germans took over. Once again, in January 1943, they tried to escape, this time over the Pyrenees into Spain. But their commanding officer, Colonal Lange, and three others were betrayed en route and were sent to concentration camps where two of them died. And yet the Germans never extracted from them any inkling that Enigma was vulnerable; to me, their devotion is as impressive as their intellectual feat in breaking Enigma. And in passing we may note that 139 Polish pilots actually escaped to fight in the Battle of Britain and that they were Polish Army units which in 1944 took Monte Cassino after it had successfully withstood all our own gallant efforts to take it.

A few Poles, too, came into Air Intelligence; one, a flight lieutenant, was in the Central Interpretation Unit at Medmenham, where he worked as a photographic interpreter. His commanding officer, Gp Capt Peter Stewart, told me that on one occasion he was taking the late Duke of Kent on a tour of inspection and the Duke asked the Pole what he was doing. Standing to attention, he very correctly replied, 'Please, Sir, you must ask my commanding officer.' After the Duke had left, the group captain took the Pole aside and, while praising him for his sense of security, told him that when a

senior officer was escorted around the unit in the company of the CO the Pole could, if asked, say exactly what he was doing. A few weeks later, the CAS himself visited Medmenham and in due course he came into the Pole's section and asked him what he was doing. Coming stiffly to attention, but with a twinkle in his eye, he replied, 'Please, Sir, I am making the secret waste!' Such experiences as all of these made me realise the poignant force of that part of Poland's National Anthem which runs 'Poland is not yet lost'.

Another important channel by which a Royal Air Force organisation gained information was that for interrogating prisoners: this task was undertaken by a branch that ultimately became an Assistant Directorate, ADI(K), and was headed throughout the war by Denys Felkin. He and his other interrogators secured much information by their gentle questioning, including the earliest mention of the *X-Gerät*, in March 1940, which occasioned my first meeting with him. From that fortunate start we worked together in complete confidence and with very fruitful results for the entire war.

Equipment and documents, besides prisoners, also fell into our hands, the principal items being, of course, crashed aircraft. In general, the documents went to Felkin, who would send them on to whomever he knew would be most interested. The examination and recovery of crashed aircraft was undertaken by the technical intelligence branch originally designated as AI1(g) and which ultimately became an Assistant Directorate. Its officers did excellent work in the field, which was followed up by detailed examination at Farnborough. One example of Farnborough's careful analysis was its noting in 1940 that the Lorenz Blind Landing Receiver installed in German bombers was much more sensitive than would be needed for its ostensible purpose: this clinched our theory that it was to be used for beam bombing.

As the war progressed, radar equipment, too, became targets for Intelligence, the first and most spectacular example being the *Wurzburg* that we deliberately set out to capture at Bruneval, and which formed the objective for the classic raid in which the Parachute Regiment won its first battle honour.

Most of our information about radar had, however, to be gained by other means, of which the easiest appeared to be the direct interception of German radar transmissions. Since such transmissions,

and also those associated with radio-navigation such as the beams, took place in the same medium, classically called the aether, as that used for Morse and telephonic communications, there was a case for these new tasks of interception to be undertaken by the Y (or Sigint) Service. But the two problems, though technically similar, were philosophically different; in signalling, the aether was being used to transmit information from one human brain in which it had originated to another human brain, by means of frequency or amplitude modulation of the radio waves leaving the transmitter; in radar and radio-navigation the waves were being used, not to transmit intelligible information, but to establish from their times and directions of travel, geometrical relationships between points in space. While the Y Service was excellent in the former task, it was not at first attuned to the second; and it was only after one of my own officers in desperation took a receiver to the south coast in February 1941 that we detected the transmissions from the German *Freyas* that the Y Service had missed from July 1940 onwards.

In parenthesis here, the differences in the two ways in which one and the same medium, the aether, can be exploited may be illustrated by the analogy of our ability to use the single medium of paper and pencil both to produce written messages and to make sketches; two different forms of expression that lead on to literature in the one case, and pictorial art in the other. Electronic intelligence can, therefore, require specialists as different in their skills and backgrounds as are pictorial artists from writers. This difference was not appreciated by the classic Y Service, nor for that matter by their post-war successors at GCHQ.

We in scientific intelligence had a mixed relationship with the Y Service as a result. Some degree of difficulty was inevitable, for if the Y Service was responsible for signals intelligence and we for scientific intelligence, whose was the primary responsibility for investigating any German development that involved a new application of science to signalling? At one of the more difficult periods in our relationship I happened to read in *The Times* of the engagement of the second-in-command of DDI4 – the Air Intelligence Branch responsible for the Y Service; he was Wg Cdr Claude Daubeny, and so I telephoned him anonymously and rendered what I could of the Mendelssohn Wedding March on a mouth-organ. Being

in signals intelligence he succeeded in tracing the call and, as he later told me, decided that I could not be so unco-operative as some of his colleagues claimed me to be. So, on being appointed a few months later to take over as head of RAF 'Y', he telephoned asking if he could come to see me. On arrival he said, 'I am now DDI4. I have served as deputy to two previous DDI4s and I saw them do everything they could to get you out of your job; they did not succeed; I want you to know that I am not as clever as they are, and so I am not going to try!'

This was the start of the warmest of friendships; Daubeny had been at Cranwell with Douglas Bader and was well into a career as a General Duties officer when he was posted to the Y Service. Here he did so well that the Navy and Army agreed that he should head the organisation that was set up for post-war 'Y'. He told me that in the final interview that led to his appointment he was asked whether he had any special requirements. 'I told them', he said to me, 'that I must have plenty of time to attend meetings, and they agreed. Of course, I didn't tell them that I meant race meetings!'

In the immediate post-war period he had found that he could make money through betting. His theory, which ultimately ruined him, was that although the odds were stacked in favour of the bookmakers, what an intelligent punter was doing was to bet, not against the bookmakers, but against the public through the bookmakers. There is one lasting memorial to his interest in horseracing; it is the siting of GCHQ, for when a new establishment had to be built for cryptographers when Bletchley was evacuated, he picked Cheltenham because he could then look forward to combining visits to GCHQ with attendance at the Cheltenham meetings. He would have been amused to see an incident on television two or three years ago, when GCHQ was invaded by racegoers who thought that they were entering the gates of the racecourse.

Mention of Bletchley recalls the fact that several of our organisations were accommodated in former country houses: photographic interpretation at Medmenham; prisoner interrogation at Latimer; technical intelligence near Harrow; besides signals intelligence at Bletchley; radio countermeasures at Radlett; MI5 at Blenheim; Political Warfare at Woburn, and so on. This fact at times encouraged the development of a 'country house' complex, where the inmates genuinely believed that theirs was the most important, and

sometimes the only significant, contribution to the intelligence war. It is easy to see how this could happen; each in relative isolation would see relatively little of what the others were doing; and then, in a visit of encouragement, some senior officer would attempt to pep them up by telling them how valuable their work was, sometimes slipping into such hyperbole as to say that theirs was the only contribution that mattered. I myself never did this; even though I visited them as often as I could, I tried to show each the whole intelligence picture as I saw it, and where their particular contribution fitted in.

It is a point that is worth watching for any future intelligence organisation, for the 'country house' complex can be a source of weakness of which I saw two other examples. Fortunately, the first was in Germany where military research after World War I was restarted in clandestine establishments which could only come out into the open after 1933. The Germans then found that they had a relatively large number of small establishments, individually too small to be ideally effective, but also strong enough to resist absorption into bigger establishments. As a result, the Germans were unable to co-ordinate their efforts as effectively as we had been able to do, and only late in the war did they attempt the task. My second example was in the French Resistance organisations where, for security, if for no other purpose, small networks had to operate in isolation, and many naturally came to believe that their contributions were unique. Friction could start when two networks overlapped, especially when some networks had different political complexions from others; and there tended to be rivalry for credit and status at the end of the war when the networks could come out into the open.

Another kind of intelligence source, too, tended to be found in country houses; these were our British experts in the field of weaponry. Radar, for example, had been housed at Bawdsey Manor, and later at Worth Matravers before settling into Malvern College; and even in large establishments such as Farnborough and Porton something of the same complex could be found. In fact we sometimes had an intelligence war between ourselves and the experts whom we came to regard as our spies on the laws of nature in the field concerned, while they regarded themselves, and not us, as the ultimate authority in what the Germans were doing in that field. I have already mentioned the battle over the V2 warhead; and I would tend to blame

what was probably our greatest failure over a new German weapon – the failure to discover the nerve gases – on the fact that in chemical warfare the authority for assessing what the Germans were doing did not rest with the regular intelligence organisation but with the chemical warfare experts at Porton.

The main Air Commands, too, resided in country houses. Fighter Command at Bentley Priory, Bomber Command at High Wycombe (Not actually in a country house. **Ed**), Coastal at Northwood and 2nd TAF at Bracknell. In a sense, too, the Commands were sources of intelligence, for they fed us the combat reports of their aircrews. At times these tended to confuse us, for example in the overclaims in the Battle of Britain, or the bomber myth that IFF paralysed the radar control of German searchlights. But the crews' experiences did intensify our own efforts to discover the nature of that control and it did prove to have a radar component. Although overclaiming had led us to regard fighter reports with reserve, they proved to be remarkably good as regards the damage inflicted on German radar before D-Day.

One important episode in which the bomber crews thought that we were doubting their claims concerned the proportion of our bombers in 1941 that were succeeding in hitting their targets. Senior officers, and even Henry Tizard, believed that we were doing well, using astro navigation and dead reckoning; but some of these had doubts which in my case were reinforced by an indignant report from a secret agent in Czechoslovakia that on a night when we claimed to have bombed the Skoda works at Pilsen there were no bombs within many miles of the town. I told Lindemann, who succeeded in pressing a most unpopular investigation of our bombing accuracy, the acid test of which would be flashlight photographs taken by each bomber. There was resentment from the crews, who thought that the investigation called into question their courage in pressing home attacks on defended targets. But they co-operated well, and the evidence proved damning to all illusions of accuracy, for on the average, only one-fifth of our bombs had fallen within five miles of their targets.

This was one of the occasions when Intelligence had to utter unwelcome truths. I myself had to do this several times, notably regarding our jamming of the X-beams in 1940, and in the use of IFF by Bomber Command over Germany in 1943 and 1944. I could hardly blame the CinC for resenting my critical reports, one of which resulted

in him being carpeted by the Secretary of State, Sir Archibald Sinclair. CAS's secretary told me that from time to time when one of my reports showed that things were going wrong, CAS would telephone the CinC and ask him whether he had seen the report and what he was going to do about it. At last, in autumn 1944, I was able to report that with IFF switched off and more discrete use of H2S, and all our counter-measures, things were now going well for the Command. This time the CinC phoned the CAS first, saying, 'Have you seen Jones' latest report?' It obviously meant all the more because of our previous refusal to flinch from saying when we thought things had gone wrong.

Indeed, a trust had gradually developed which can be simplest illustrated by the difference in attitudes between 1941 and 1944. In 1941 I had wanted to try to deceive German bombers by sending them counterfeit messages, which we could easily have done, but DCAS – who happened to be Bert Harris – refused permission on the grounds that we might well give away more than we would gain. But in 1944 not only did we have permission to give spoof instructions to the German night-fighters, but Bomber Command would te1ephone me every afternoon before operations with exact details of targets, timings and routes, so that I could try to guess which beacons the German night fighters would be sent to orbit as our raids developed, so that our own night fighters could be sent to attack them at the beacons.

As illustrated in our relations with Bomber Command, the need for Intelligence to have both integrity and a voice that is independent from the operational staff must be paramount in a healthy military organisation. If anyone doubts this, let him read the second chapter of Freeman Dyson's book *Disturbing the Universe,* describing his experiences in the Operational Research Section at Bomber Command – or Winston Churchill's verdict on the Battle of the Somme: 'Sir Douglas Haig was not at this time well served by his advisers in the Intelligence Department of General Headquarters. The temptation to tell a chief in a great position the things he most likes to hear is the commonest explanation of mistaken policy. Thus the outlook of the leader on whose decisions fateful events depend is usually more sanguine than the brutal facts admit.'

Thus one of the features of working with Churchill was his interest in getting the facts from Intelligence, even to the extent of sometimes wishing to see the raw reports for himself. He only had the time to do

this occasionally; but as in all his other activities he wanted to maintain contact with the front line with as few intermediate links as possible, and so at times he would summon individuals such as myself. And even though he might have flashes of anger when you had to tell him some particularly unwelcome news, he knew from his earlier experiences that this was the only way to correct 'mistaken policy'. Incidentally, among his earlier experiences were some 140 flights to acquaint himself with the handling of aircraft – before June 1914!

Besides Churchill himself I was privileged to come into working contact with many of the senior Air figures in the war, and an entire talk could be devoted to reminiscent appreciations of their achievements and characters. Charles Portal as CAS for example, took a great interest in our work and invited me to contact him direct if I had a problem that the normal organisational arrangements would not clear. This was never necessary when Charles Medhurst was ACAS(Int) because he gave us splendid support. Sholto Douglas, too, as CinC of Fighter Command, was determined to use all the information we could provide, both in the Battle of the Beams and in exploiting the decrypted German radar plots of our fighter sweeps. If I had to single out the senior Air Officer who has had least recognition from posterity for the magnitude of his contribution it would be Wilfrid Freeman, who as the pre-war Air Member for Research and Development had warmly and powerfully supported the development of radar by Watson-Watt and of the jet engine by Whittle, the Mosquito by de Havilland and several of the ideas of Barnes Wallis. In 1940 he might well have become Chief of Air Staff, but unselfishly agreed to be Portal's Vice-Chief, even though his seniority was such that he had been on the Directing Staff at Staff College when Portal was taking the course. And again, in 1941, when things were going wrong in the Mediterranean, and Churchill had such doubts about Tedder's leadership that Freeman was sent out to investigate, Portal signalled him with the suggestion that he should stay and take over from Tedder. On receiving the suggestion, Freeman signalled back; 'It is obvious that evidence of friend sent out to investigate is being used to incriminate. You and S of S will understand that role of Judas is one I cannot fill.' And so he gave up the chance of going on to be Deputy Supreme Commander in Normandy. I still have an entirely

unsolicited and handwritten note from him as VCAS congratulating me on my report on the *X-Gerät* of January 1941 which, because it incidentally showed that our countermeasures organisation against the X-beams had so far been almost entirely ineffective, aroused so much hostility from the staff concerned that they succeeded temporarily in enforcing its withdrawal. But Freeman went well out of his way to encourage me, describing the report as 'admirable' despite the controversy it had raised among the staff. That was the kind of man he was – and no-one deserves a biographer more. (Again, this was said in 1986; the gap has since been filled by *Wilfrid Freeman* by Anthony Furse; Spellmount, Staplehurst, 1999. **Ed**)

If I may mention one other officer who has received little mention in the records but whom I came to admire, this would be Air Cdre Frank Woolley, the Chief Intelligence Officer of the Mediterranean Air Forces in 1944, which reminds me that yet another kind of Intelligence War that we had sometimes had to fight was with our American counterparts when it came to deciding the destination of captured German equipment. Naturally, they wanted it to be sent direct to America, and we to Britain. At one stage there was a crazy ruling that anything small enough to go into an aircraft should come to us, and anything bigger should go by ship to America. One friendly American colonel said to me that this was resulting in my chaps going around with hacksaws and his with welding torches. At times, though, things could be unpleasant, and one of my civilian officers got so worked up that he threw an inkstand through the window of an American colonel (not the one of the previous sentence) from inside the colonel's room. I thought it tactful to recall him, and in due course I sent out a replacement, having taken the greatest care to pick one on whose equable temperament I could depend. I was grateful to Frank Woolley for even accepting a replacement after all the trouble he had had in smoothing out the previous fracas.

I was, therefore, horrified when before long there was an even more serious fracas when my new representative asked to go to Rumania to examine captured radar there. The Americans insisted on sending one of their civilians to accompany him, even though their man was not nearly so well qualified and was, in fact, junior in rank; and they insisted that their man should be in charge. In Bucharest there was a flare-up which went so far as the American striking our

man – but because the American had the signals link, he radioed a formal complaint alleging that he had been struck by our man, and asking for the latter's withdrawal. 'This makes stirring reading,' minuted 'Tubby' Grant, the Director of Intelligence in London, when the papers were laid on his desk. It became quite an inter-allied incident and I would have entirely understood if Frank Woolley, having had the previous trouble over one of my staff, had insisted on the second man being recalled, and been only too glad to be relieved of us turbulent scientists. Instead he signalled that he was taking no action until he had heard my officer's account of the incident and in the meantime he weighed into the Americans stressing the vital importance of our work to the Americans and the Russians as well as ourselves. It fortunately turned out that the behaviour of our man had been exemplary in the face of provocation, and Woolley's faith in us had been justified; but I learnt much from his restraint in not passing judgement until he had heard both sides, despite any predisposition to believe the worst.

At that point he and I had never even met; and our meeting was delayed because of serious injuries he sustained at Cassino. He may be remembered by some from pre-war air force days, for he carried out the acceptance trials for the Anson, which developed into one of the great workhorses as a result of his suggestions.

Fortunately, Woolley was one of those Royal Air Force officers of whom it has been my privilege to know many, who are patient enough to endure the peccadilloes of civilian scientists. In retrospect I gratefully recall how patient most senior air officers were with us. The tradition evidently goes back to RFC days, for the late Sir William Farren wrote of his experiences in 1916 in learning to fly along with F A Lindemann (later Lord Cherwell) when they were civilian scientists at Farnborough. 'I doubt', wrote Farren, 'whether anything about him impressed me quite as much as his complete indifference to the difficulties of arriving at an RFC station in a bowler hat and carrying an umbrella. Lindemann was unperturbed and, to my surprise, so was the RFC. Their instructions were to teach us to fly, and presumably did not extend to what particular kind of clothes we wore.'

I found almost the inverse situation one day in 1943 when I was visiting the Central Interpretation Unit at Medmenham and I was asked over a pre-lunch drink what kind of man Professor J D Bernal

was. I cautiously replied that he was a very good physicist, and asked the cause of the enquiry. I was then told that he had visited Medmenham in the previous week because he was concerned with bomb damage assessment, as they also were. They had been set back by his untidy appearance and they commented, 'After all, we are a regular RAF Station, and he might have put on a decent suit to visit us. But he seemed quite a pleasant chap, and at the end of the afternoon he invited us to go over to see his own work at Princes Risborough. We went yesterday, and as soon as we saw him in his own place we realised we had done him an injustice — he *had* put on his best suit when he came to visit us!'

There are many other points that I should like to have made, but they would stretch far beyond the compass of a single lecture. I have said nothing, for example, about the many gallant actions by RAF personnel in the pursuit of the intelligence we required, such as the contributions of Sqn Ldr Tony Hill and FSgt Charles Cox to the success of the Bruneval raid, and Plt Off Harold Jordan and the entire crew of the reconnaissance Wellington who, although wounded, survived eleven attacks by a German night fighter while listening to its *Lichtenstein* radar, and brought their riddled aircraft, and their vital information, back to England. Also, I have not discussed the problems of deciding priorities between short-term and long-term intelligence, for example in competing for the cryptographic effort at Bletchley. Nor have I mentioned the complementary task of Intelligence in trying to mislead the intelligence organisation of an opponent, such as the part played by Flt Lt Cholmondeley in *The Man Who Never Was,* or the hazardous operations of dropping and picking up Resistance agents. These and many other topics could be among those that the Society may care to consider in its future deliberations.

Looking back on those aspects with which I myself was particularly concerned, our successes, such as those against the beams, radar and the V-weapons, were obvious enough, but we sometimes had failures even in the midst of success, and something might be learned from studying them. The nerve gases, for example, were not recognised; this was due at least in part to the fact that, although we heard of nerve gas in 1940, the correlation of intelligence in chemical warfare was not done in the intelligence organisation proper, but at Porton where the interpretation of reports may have been biased too

much by a knowledge of what Porton itself had succeeded or failed in developing. We may have been slow to detect upward firing guns on German night fighters, and it seemed that we did not emphasise sufficiently, although we had reported it, the awkward height at which the V1s flew – too high for light, and too low for heavy, AA guns. We also failed to recognise the aerodynamics research institute at Volkenrohde. In nearly every case part of the explanation lay in inadequate liaison between different sections of intelligence or between the intelligence organisation and the operational commands or our own research establishments.

Where we succeeded, I felt, this was due to strengths of understanding that came from contacts that were all the closer and warmer under the stimulus of a perceived danger. And here, in conclusion, I would echo Tizard's verdict on the success of his famous Committee on the Scientific Survey of Air Defence:

> 'The first time, I believe, that scientists were ever called in to study the needs of the Services as distinct from their wants, was in 1935, and then only as a last resort. The Air Staff were convinced of the inadequacy of existing methods and equipment to defeat air attack on Great Britain, and a Committee was established for the scientific survey of air defence. I want to emphasise that this committee, although it consisted on paper only of scientists, was in fact from the first a committee of scientists and serving officers, working together.
>
> When I went to Washington in 1940, I found that radar had been invented in America about the same time as it had been invented in England. We were, however, a very long way ahead in its practical applications to war. The reason for this was that scientists and serving officers had combined before the war to study its tactical uses. This is the great lesson of the last war.'

And that lesson applies with as much force to intelligence as it does to science.

MEETING ON 16 MARCH 1987

Introduction by Air Marshal Sir Frederick Sowrey

Introducing John Terraine, the Chairman said that he was '... an historian who is perhaps best known for his work on World War I and he needs little introduction to us. His volumes on that war stand four-square on their style and accuracy, and also on their judgement. His linking through to the last war, which I think appears between the lines of *The Right of the Line*, gives him a perspective on the use of air power which is invaluable to us.

John Terraine could also perhaps be credited as the fertile soil on which this Society grew, because it was after his lecture at the RUSI that a straw poll was held to see whether there was likely to be support for a Society such as ours, when we knew that there was incipient response but nothing had been put practically to the test. He speaks to us tonight, not only as an historian, but as a patron and a member.'

WORLD WAR II – THE BALANCE SHEET

by John Terraine

I must say first of all that I am very sensible of the honour that the Society has done me by inviting me to address you tonight at what is only the second meeting. I am also sensible, in a wryer sense, for myself, of my difficulty in following a speaker like Professor Jones who got our inaugural meeting off to such a magnificent start.

I think I should first of all make it clear what this 'balance sheet' is that I shall be speaking about tonight. As you may guess, it is strictly a World War II RAF balance sheet. I do not venture beyond 1945; I do not put myself forward as a crystal-ball-gazer of any kind; and the 'balance' in question is a balance between intention and performance, which I do not propose to measure by ledger accountancy, but simply to describe and leave the accountancy to you.

In any such computation it must, of course, be a heavy weighting factor that we – the British Empire and the Royal Air Force – emerged from World War II on the winning, and not the losing, side. It is a significant consideration. Also, I think I should add one qualifying rider to what I have just said, which may best be expressed by an

illustration. A few weeks ago I opened a seminar at the Royal United Services Institute with an historical résumé on the subject of Land/Air warfare. Each speaker was to talk for 35 minutes, and I was somewhat disturbed to find that rather more than 20 minutes' worth of my talk was taken up with World War I. Disturbed, that is to say, until I totted up (for my own benefit as well as that of the audience) the list of subjects that I had been discussing; it was this:-

- long-range reconnaissance
- short-range reconnaissance
- photographic reconnaissance
- aerial survey
- artillery co-operation
- interdiction
- the tactical use of air power.

If you add to those, naval co-operation (with particular emphasis on anti-submarine warfare), the beginnings of air supply, and appreciable development of strategic air offensives, you will see that there is not much left; World War I virtually ran the air power gamut. Sadly, however, as it turned out, the RAF never quite took the measure of its own antecedents.

Institutionally, as we all know, the RAF was born on 1 April 1918 but as an instrument of military aviation I would suggest that a better date would be 13 August 1914, when the first three squadrons of the infant Royal Flying Corps flew into the theatre of war; one of history's significant first occasions if ever there was one. When their back-up organisation, known as the Aircraft Park, also arrived, the RFC was a going concern, and since the Western Front was the decisive location of the First World War, it could not have been more effectively placed.

Equipment, of course, was always the limiting factor – there were very strict limits to what the aircraft of the day could do; but one role the RFC seized upon unhesitatingly – long-range reconnaissance. Throughout the Mons campaign in 1914 and the retreat to the Marne, the RFC established itself as the 'eye in the sky' to such an extent that British GHQ, which had originally been more than somewhat patronising, abruptly swung over to 'almost embarrassing deference' –

a condition which, of course, carries with it certain dangers of its own.

When the war settled down into trenches and became (as it very soon did) an artillery war, short-range reconnaissance in collaboration with the guns became the prime duty of the airmen, and remained so for the rest of the war. An early refinement of this function was photographic reconnaissance which made possible an accurate charting of the enemy's lines, defences, supply dumps and communications. A further refinement of this, whose 'finest hour' for the RFC came in 1917, was a meticulous aerial survey of the whole British front, which the Royal Engineers translated into the first really reliable map. This became the basis of the 'artillery boards' supplied to all the batteries. Thanks to this, and the introduction of the technique of calibration, the artillery was now able to open fire without previous registration at exact targets (instead of what I have called 'blazing away at a landscape'), thus restoring surprise and bringing precision into battle practice. These two factors, plus protection supplied by smoke, unlocked the trench-bound battlefields and restored the war of movement in 1918. That was a direct fruit of Land/Air co-operation – in fact its most valuable fruit – and it is one of history's extraordinary circumstances that it took until 1942 for the penny to drop in the next war.

But that was not all. There was interdiction, or rather, attempts at interdiction. The first (by the RFC) was the attempt to do severe damage to the railways behind the German front during the Battle of Loos in September 1915. With the aircraft and bombs of the day this could only be a pathetic failure – which it was. A later attempt, on 8 August 1918 (the opening of the highly successful Battle of Amiens, 'the black day of the German Army'), was intended to destroy the Somme bridges to prevent reinforcements from reaching the German front. It proved to be a 'black day' for the RAF also; 45 aircraft were shot down and 52 more were so badly damaged that they had to be written off. The bridges stood. It was, nevertheless, a day worth mentioning in the history of air power because on it the RAF deployed some 800 machines, and the French on their right over 1,100 – an amazing total of 1,900 aircraft bearing the clear sign that this was what great battles of the future were going to be like.

I mention air supply in my list of contributions. The scale, I need hardly say, was trivial by the standards of the later war, but everything

has to have a beginning. For the RAF this was on 4 July 1918 when aircraft dropped 100,000 rounds of small arms ammunition to Australian machine-gunners on the battlefield of le Hamel. During the advance in Flanders in October, when rain turned the old Ypres battlefields into swamps which threatened to cut off supplies to the forward troops, the RAF joined in a drop of 15,000 rations – a ludicrously small amount by comparison with, say, RAF supplies to the Fourteenth Army during the monsoon advance in Burma in 1944, but as I say, there has to be a beginning.

The same was true of close tactical support. This was always difficult, and very dangerous, to practise against forces well entrenched. During the great German advance in March 1918 the landscape suddenly filled with troops and vehicles out in the open. The British and French fliers needed no urging to 'have a go' and they certainly produced effects, but these were local and, in relation to the scale of the battle, insignificant. However, there was a very clear hint of what the future might hold in General Allenby's final advance in Palestine in September. His small air contingent flung itself upon the Turks and turned their retreat into a rout, with scenes of destruction which seem to be previews of the Falaise Gap in 1944. All in all, the air performance in World War I was impressive and one might have supposed that it would leave imperishable memories and a clear example for both Army and Air Force. Alas, it did not! As Sir Maurice Dean wrote:- 'Between 1918 and 1939 the RAF forgot how to support the Army.' Since it turned out that the RAF had also forgotten how to support the Navy it may be said that this was a costly lapse of memory. It certainly prompts the question – What *did* the RAF think it was *for* in the 1930s? That question is, of course, no sooner asked than answered.

Members of this Society are unlikely to forget that the RAF, as a separate Service, was in fact born of a strategic air offensive, launched by the German Air Force with Gotha and R.VI 'Giant' aeroplanes in May 1917. The attack on British cities by these aircraft was not, by our standards, very destructive of life or property but the effect on the *morale* of people and Government was enormous. As the Chief of the Imperial General Staff remarked after a Cabinet meeting following one of the raids, 'One would have thought the world was coming to an end.' So, the Smuts Committee was set up, and out of its findings the

RAF was born.

Already the German performance was being challenged by a British counter-offensive and in June, 1918 the Independent Force came into existence under Major-General Sir Hugh Trenchard – and that was a date in history, too. In the time given, Trenchard's Independent Force actually caused even fewer casualties and less damage than the Germans had done, but once again the morale effect was considerable and Trenchard himself pronounced that:- 'the moral effect of bombing stands to the material effect in a proportion of 20 to 1.' This belief became the foundation-stone of RAF strategic thinking thereafter.

In the inter-war years the pursuit of a strategic air offensive as a substitute for the existing modes of waging war, the deep faith in war by bombing, and the equal faith that, in Mr Baldwin's famous phrase, 'the bomber will always get through', took on the attributes of religious dogma. It may, indeed, be said that bombing was what the RAF was all about. *Some* Imperial policing had to be done, *some* concession had to be made to civilian fears, *some* fighter squadrons had to appear on the strength, but bombing was what the RAF understood by real air warfare, and bombing was what it chiefly intended to perform.

In the 1920s and '30s the constant refrain of both the champions and the enemies of air power was the prospect of what was called *'the knockout blow'*. It was the hope of delivering a quick crushing blow at the enemy's heartland, instead of engaging his armed forces, that enthused the air power prophets. This, they said, would be the new style of warfare, the revolutionary language of the future. As such it was very welcome because the still fresh memory of 1914-1918, and particularly the costly battering-ram procedures of the Western Front, was viewed with intense revulsion by many people. So, the 'anti World War I' school lined up on the side of air power, with its promise of a short, sharp conflict in which, with luck, bricks and mortar would be the chief sufferers.

Politicians echoed the national mood as they usually do. The Treasury, always trying to cut military expenditure by every available means, approved of the air force as an economical alternative to a conscript army and a big battle fleet. Supporters of disarmament and collective security through the League of Nations were quick to seize

on the 'knockout blow' as a powerful argument on their side. Add to this the science-fiction output in literature and the cinema and one can see that a considerable degree of hysteria attached itself to the subject, and with it a degree of unreality. What I find hard to accept is the virtually complete failure to take note of the actual air warfare that was taking place at the time.

In 1932 the Japanese bombed Shanghai, and people paying their weekly visit to the cinema were able to see the bombs fall and the smoke go up, and a very shocking sight it was. Exact information about what was happening was, of course, just about impossible to come by – I mean figures showing how many aircraft were used, how many tons of bombs were dropped, how much damage, how many casualties, how many killed, etc. Very difficult to establish, but I wonder how hard anyone really tried. One fact about the Japanese war in China does stand out, however, and steadily made itself clearer at the time; that whatever might be happening in it, *what was not happening was a 'knockout blow'*. In the ten years that separated the Shanghai bombing from Pearl Harbour the cities of China experienced a pretty fair amount of air bombardment, but *China was still in the war.* It seems to have been a point worth noting but there is no evidence that anyone did.

There was another example too, if anything even more striking. The Spanish Civil War broke out in 1936 and for three years Madrid was a beleaguered city, under some degree of air attack for most of that time, with large international Press coverage and some very striking newsreels to illustrate the event. Barcelona was also heavily attacked, the bombing there in March 1938 causing a casualty total about the same as Britain's in the whole of the First World War. Civilian air raid deaths in the entire Spanish war would seem to have been about 14,000 in the Republican area and about another 1,000 in the Nationalist zone. That amounts to roughly 3% of the full total of people killed in the war. Once more, *there was no 'knockout blow'.*

What there was, however, was a very considerable air contribution to the land battles by each side. The Nationalists in particular compensated for a serious shortage of artillery by using German bombers, most spectacularly the Junkers 87 dive-bombers, which thus obtained a new lease of life on the threshold of obsolescence and would be heard of again. It was in August 1938 that 'command of the

air passed decisively to the Nationalists', after which the issue of the war was never in doubt. Yet the Chief of the Air Staff, Sir Cyril Newall, pronounced that this aspect of the war was a 'gross misuse of air force', and there is nothing to show that he had changed his mind by September 1939 or even May 1940. So we see that the RAF between the wars was dedicated to long-range bombing as its chief expression of air power and it is, therefore, the more curious, I think you will agree, that it was not until the spring of 1938 that it began to make actual plans for carrying this out.

Now, when we talk of the RAF we are talking of a technical service which is not to be understood in any other sense; divorced from its aircraft the RAF, unlike the *Luftwaffe* of that period, ceases to exist. So it is important to remind ourselves of what comprised Bomber Command in 1938:-

17 squadrons of Fairey Battles
16 squadrons of Bristol Blenheims
5 squadrons of Handley Page Harrows
2 squadrons of Vickers Wellesleys
9 squadrons of Armstrong Whitworth Whitleys.

The Battles, Harrows and Wellesleys were recognised as obsolete and were on their way out; the Blenheims never pretended to be anything but short-range aircraft and, as I said in *The Right of the Line,* 'nine squadrons of Whitleys did not make a strategic bombing force'. Yet it was precisely at this time that the Air Staff and Bomber Command were insisting that by concentrating on 19 power plants and 26 coking plants in the Ruhr, flying 3,000 sorties at a cost of 176 aircraft, the RAF could bring German war-making capability to a standstill. The bomber mandarins seem to have existed in a 'Never-Never Land' unrelated to geographical, mechanical or numerical reality: knocking out the German war industry in a fortnight with 144 Whitleys takes some beating!

Fortunately a sharp wind of realism was about to blow. Air Chf Mshl Sir Edgar Ludlow-Hewitt became AOCinC, Bomber Command in September 1937. He had a penetrating mind and a sharp eye, and was forthright in expressing his views. It was his belief that war planning without operational efficiency is merely hypothetical, and on taking up his post he set about investigating every aspect of Bomber Command's readiness for war. He presented two reports, which make

astonishing reading after all the talk of independent air power and 'knockout blows'; they display the RAF's centrepiece, its favourite child, with merciless clarity on the very *eve* of war. It amounted to this; in Ludlow-Hewitt's opinion his Command was 'entirely unprepared for war, unable to operate except in fair weather, and extremely vulnerable both in the air and on the ground.' Well might the official historians say, on this authority, that '.... when war came in 1939, Bomber Command was not trained or equipped either to penetrate into enemy territory by day or to find its target areas, let alone its targets, by night ... This seems a strange result after twenty years of devoted work.' It does indeed. It meant, as Webster and Frankland say, that the RAF's most treasured instrument was 'incapable of carrying out the operations on which the Air Ministry had based its strategy for the last four years.' Indeed, with war immediately imminent, there was a very real difficulty in finding anything effective at all for Bomber Command to do – an extraordinary state of affairs.

And this was not all. Fighter Command, under Air Chf Mshl Sir Hugh Dowding, was a thing apart, inasmuch as it contained the two most effective weapons in the RAF's armoury, the Hawker Hurricane and the Supermarine Spitfire. Both were combat aircraft and both were unquestionably capable of performing the tasks for which they were intended, which was something you could not say for most others. Dowding's problem was very simple, to get and keep enough of them, and this brought him up against an unpalatable truth; that despite a practically nationwide aversion we were, once again, going to be engaged in a coalition war on the European continent. Once again there would be a BEF as in 1914, but unlike the 1914 article this one would require immediate large-scale air support, and this air support would have to have a fighter component. Dowding had no doubts about what that would consist of; the only RAF aircraft that could deal with modern German fighters (already seen in action in Spain) were his precious Hurricanes and Spitfires. The Spitfires he was determined not to let out of his grasp, so it would be Hurricanes, at first just four squadrons of them. But the demand from all quarters kept growing and Dowding grimly remarked 'the despatch of 4 Field Force squadrons has opened a tap through which will run the total Hurricane output.' His unflagging fight was to keep a hand on that tap

– if it was possible.

When war came some fundamental matters were soon decided. First, there was the immediate abandonment of the anticipated strategic air offensive against Germany – a traumatic *volte-face*. Coupled with that was the discovery that daylight operations against the German mainland were out of the question, and whatever was to be done – leaflet dropping or bombing – would have to be done at night. In other words, Bomber Command would have to become a night force, which was something for which it had never been intended, equipped or trained. This was traumatic, too. Also, it was realised with much dismay that, even in attacking the more accessible targets just across the North Sea, bombers were *not* able to defend themselves against modern fighters, even in tight formation. Another trauma. And when the real fighting in the West began the lessons flowed in thick and fast, with the Battle of France in May and June, 1940 supplying the real tutorial.

It is difficult, in my opinion, to exaggerate the historical importance of the Battle of France. It was what Ronald Lewin would call the 'pay-off', of a whole complex of errors – political, ideological, technological and strategic – which possessed the Western world between the wars. The German triumph in France in 1940 has been attributed to various factors with more or less truth. For myself, I have no hesitation in saying that the decisive element was what I call 'the saturation of a battle area by air power' – and at the root of that achievement was the fighter. In France in 1940 the fighter was the sanction of all that occurred or did not occur. The Allies discovered that their weapons and their system of war were irrelevant to the 1,200 Messerschmitt 109s and 110s which saturated the battle area and made possible the operations of about 1,700 assorted bombers and ten *Panzer* divisions. The only weapon on the Allied side that proved to be able steadily to cope with the stresses of the battle was the RAF's Hurricane. The Hurricane pilots never had the sense of being outclassed – but they were only too well aware of being outnumbered.

The grim outcome was, as I said in my book, that the RAF now found itself in the position of 'looking over both shoulders at once, which is an awkward posture for a man and tends to blur his vision'. The Air Staff and Bomber Command were still looking at Germany; Dowding was looking at Britain, which it was his duty to defend. But

the decisive battle was happening in France and the hard truth is that the RAF was virtually irrelevant to it. If we are looking for a lesson it is clear enough, don't be irrelevant. The humiliating disaster of the Battle of France is one of history's great punctuation marks. It totally altered the terms of reference of the Second World War. It marked the end of an epoch – of dreams, unreality, theories and follies. It could all too easily have marked the end of Britain and the British Empire: but after June, 1940 the realities came thundering in.

After France, Britain: that was the obvious logic – but history is rarely so simple. The question in July, 1940 was whether the *Luftwaffe* could now take command of the sky over the narrow waters of the Channel as it had done in France, thus neutralising British sea power and making invasion possible. Its commander, Hermann Goering, thought it could, and Hitler allowed himself to be persuaded. What followed was the Battle of Britain, the first decisive air battle in history – decisive in all senses of the word. It was also one of history's ironies. The battle was fought and won by Fighter Command, yet the separate RAF really existed for the opposite purpose – offensive bombing. The RAF was not really about fighters at all.

In the Battle of Britain, as usual in air matters, we see technology again at the centre of the event. There were, first, the two admirable fighters, the Spitfire and the Hurricane, and there was the system of using them – a system itself based on the new technology of radar which had provided the guideline for Fighter Command since its very beginning. The Dowding battle system was one of tight control and deployment founded on the intelligence coming from the radar chain and other sources, received in Fighter Command's famous Operations Room at Stanmore, filtered and transmitted outwards to the Operations Rooms of the Groups and Sectors, and finally passed to the squadrons in the form of precise instructions about location and altitude and what to expect, through one of the most comprehensive communications networks so far seen. Control was definitely tight, all the way down. I said in *The Right of the Line*, there was no place in it for 'free-range' activity or mavericks'. I was referring, of course, to AVM Sir Trafford Leigh-Mallory, AOC 12 Group, and that distinguished flyer Sqn Ldr Douglas Bader, and the 'big wing' dispute which blemishes the ultimate achievement. It is my view that there was never very much reality in the 'big wing' theory. The whole thing

was really a matter of personality – the ambitious personality of Leigh-Mallory and the eager, combative personality of Douglas Bader. The blemish lies in the apparent inability of RAF command procedure to deal with a situation which ought never to have developed at all.

The RAF's achievement in the battle (and we should remember that both Bomber Command and Coastal Command did also play a part in it) was *victory, clear and unmistakable:* the clear defeat of the *Luftwaffe*, Germany's first defeat in the war. And from that victory Air Chf Mshl Sir Hugh Dowding emerges as the only air commander with an unquestionable 'battle honour' of his own.

So, the invasion of Britain was ruled out, but by any rational military judgement Britain's overall position was hopeless. Fortunately, rational military judgement did not decide the issue, Hitler took the astonishing, and really lunatic, course of attacking the Soviet Union with an undefeated enemy at his back. So Britain was saved after all, but her survival was nevertheless precarious. For those at the centre of affairs another threat visibly developed in 1940 which somewhat dulled the lustre of the victory in the skies.

I am, of course, referring to the U-boat campaign against Britain's whole supply system, which took on a new dimension when the Germans occupied the European littoral from the North Cape to the Spanish frontier. We had faced a U-boat peril before, above all the 'unrestricted U-boat warfare' which began officially in February, 1917 and remained a serious threat until the second quarter of 1918. It was in 1917 that the Secretary of State for War told the Commander-in-Chief of the British Expeditionary Force, '... we have lost command of the sea.' His words would be ominously echoed in 1942. In the event, solutions were found in 1917-1918. The U-boats were defeated but they had provided the most serious naval threat since the Spanish Armada, and probably the worst scare that the Admiralty had ever had. Amazingly, in 1937 we nevertheless find the Naval Staff asserting that 'the submarine should never again be able to present us with the problem we were faced with in 1917'. 'Never again' – fatal words; call-sign of too many disastrous notions between the wars!

The new battle against the U-boats effectively began in the summer of 1940 and for the next three years, as Churchill says, that 'one anxiety reigned supreme'. From the western point of view the Battle

of the Atlantic, fought from 1940-1943, was *the decisive battle of the war* – in two ways. It was, first of all, a decisive defensive battle on which Britain's survival depended as surely as it did on defeating the *Luftwaffe* in the sky in 1940. This defensive phase lasted from mid-1940 until the first days of 1942. The battle ceased to be defensive when the decisions taken at the Arcadia (Anglo-American) Conference in Washington in December 1941 and January 1942 became official Allied policy. The most important of them was the American decision to take on 'Germany first'; it was fundamental, and shaped the rest of the war. The natural corollary of 'Germany first' was an Allied landing in north-west Europe, which meant a massive build-up of American land and air forces in Britain (BOLERO) for an assault in 1943 (ROUNDUP). From the moment of that decision the Battle of the Atlantic became also the lynch-pin of Allied *offensive* strategy.

Now, where does the RAF come in? It comes, of course, in the form of Coastal Command under a succession of able AOCinCs: Sir Frederick Bowhill, Sir Philip Joubert and Sir John Slessor. Coastal was the Cinderella of the Commands in 1939, the most obvious victim of the 'locust years' of pre-war neglect. Nothing illustrates its 'Cinderella quality' better than its armament: the core of its strength in 1939 was ten squadrons of Avro Ansons, scarcely military aircraft at all, lacking speed, lacking range and virtually unarmed. The Command as a whole had practically no combat capacity and in fact reconnaissance was just about all it was expected to do. It took a long time – until 1942 in fact – to change this deplorable state of affairs and get back to the highly effective methods of co-operation between naval and air anti-submarine forces which had become regular, standard drills in 1918. The Navy had forgotten the hard-bought lesson that what it liked to call 'offensive tactics' (large-scale U-boat hunts) were a sheer waste of time. The one sure place to find U-boats was near convoys and in World War II, convoy escort, derided as 'defensive action', was in fact the opposite. Convoy escort was where you made your kills. And for convoy escort, 1918 also taught that the right kind of aircraft was essential.

'The right kind': Well into 1943, Coastal Command's great struggle was for the necessary equipment of all kinds: for more and better aircraft, especially VLR (in particular the Very Long Range

B-24 Liberators); for weapons – illuminants and depth charges with the right fuses and fillings; for ASV (air-to-surface-vessel) radar, in fierce competition with Bomber Command. And all the time there was intense tactical study, the ceaseless perfection of techniques; methods of attack, speeds, heights and angles of approach, fuse settings, depth-charge spacings, communications with naval vessels and ships in convoys, etc.

At last the day came (in July 1942) when air action, which in the first half of the year accounted for just over *30% of a very small number* of U-boat kills, in the second half accounted for *53% of a substantial number.* That was the turning point. The moment of decision was May 1943, during which no fewer than 41 U-boats were sunk. Aircraft claimed 56% of these kills, and of the aircraft total Coastal Command claimed 69.5%. Among the various forces engaged, *it had become a major U-boat killer.* And it remained an outstanding scourge of the U-boats for the rest of the war. D-Day in 1944 put the crown on Coastal Command's efforts, as it did on the Atlantic battle as a whole: 30 Coastal Command squadrons covered the south-western approaches to the D-Day convoy routes, quartering every square mile of sea every 30 minutes by day and night, with the result that the U-boats proved totally ineffective against the great combined operation.

The D-Day landings and the Battle of Normandy were the supreme offensive action of the Western Allies in the war, contributing incalculably to the defeat of Germany. The victory in the West could not have taken place without the victory in the Atlantic, which thus rates as an *offensive* victory of maximum importance. It is fair to say that Coastal Command had restored the lost art of naval co-operation with a vengeance!

So Britain, at the end of 1940, had won one fight for survival and was firmly locked in another. But what was she doing – what *could* she do at that stage – about actually defeating Germany? It is clear that the Royal Navy with all its merits cannot be the direct element in winning victory over a major land power based in central Europe. The Army, after Dunkirk, took a long time to rebuild its strength, and from June 1940 until the end of 1942 (with the exception of the brief, disastrous campaign in Greece) it saw little of its main enemy. Its chief opponent, the *Afrika Korps*, never numbered more than four

weak divisions out of a German battle order of 471 divisions in the spring of 1942. That left the RAF. Bomber Command could at least have a go at what it was always intended for: the attack on communications, military installations and war industry in the enemy's homeland, and at the same time a blow at the *morale* of his population. And so, with a force which, until 1943, was almost entirely composed of Wellingtons, Hampdens and the ancient Whitleys (and which very rarely in 1941 numbered more than 200 operational aircraft) Bomber Command set out to do just that, because there was absolutely nothing else that Britain could do to damage Germany. Bomber Command thus shared the hard experience of the BEF in 1915 and 1916, lacking weapons, lacking necessary equipment of all kinds, lacking experience and training for the new style of war, but forced by *inexorable circumstance* to engage a powerful and determined enemy.

We should always remember that the strategic air offensive, as it developed between 1940-1945, was born of *defeat.* Without utter defeat in France, if the front in the West had continued to exist, I do not see how there could have been a strategic air offensive; the RAF would have been far too busy supporting armies which would have had their work cut out to survive. However, there *was* such an offensive, and a vast enterprise it ultimately became. I must freely admit that my admiration for the aircrews of Bomber Command, British, Dominion and Allied, is so deep as to be virtually inexpressible: theirs was 'the right of the line' indeed and a damned uncomfortable place it can be, as they found out. The strategic offensive is always associated – understandably – with Bomber Command's most famous AOCinC, Sir Arthur Harris. It was *not* his brain-child, nor was it ever his sole responsibility; it was not even the sole responsibility of the Air Staff. It was the responsibility of the Chiefs of Staff (and later the Combined Chiefs of Staff) and of the British and American Governments with, let it be said, the warm approval of the overwhelming majority of their peoples. The form of it, which aroused considerable dismay later, was above all dictated by the distressing discovery in 1941 that the only target that Bomber Command could be trusted to hit by night was *a large German town.* At that stage of technology, in other words, its only reliable technique was *area bombing,* a name that would gather evil associations.

Area bombing had the attraction that it offered a fair chance of hitting some sort of military or industrial target, and at the same time of striking at that German *morale* which Bomber Command, inspired by Lord Trenchard, believed to be the weak spot in Germany's armour. There is no point in being mealy-mouthed about the attack on morale; in my book I said this:- "Morale' is a cosmetic word. Attacking morale, whatever phrases it may be dressed up in, really means only one thing: putting the fear of death into individuals. On a collective scale it means threatening a massacre.' The scale of the proposed massacre is somewhat breathtaking. In November, 1942 the Chief of the Air Staff, Air Chf Mshl Sir Charles Portal, stated that, given enough aircraft, it would be possible in 1943 and 1944 to drop one and a quarter million tons of bombs on Germany. He outlined the material damage that could be expected from this and added:- 'Twenty-five million Germans would be rendered homeless, 900,000 would be killed, and one million seriously injured.' 'One thing', I said, 'emerges with absolute clarity: this was a prescription for massacre, nothing more or less.'

Hindsight, of course, can be a trap; we have to remember that this was November 1942, near the close of a very bad year littered with disasters; none of the hopeful things that came in 1943 had yet appeared. The war was still dominated by German strength, and as Dr Noble Frankland insisted, 'The great immorality open to us ... was to lose the war against Hitler's Germany. To have abandoned the only means of direct attack which we had at our disposal would have been a long step in that direction.' One thing, I believe, is as certain as anything in human history can be: that *some* form of bombing offensive by the RAF was inevitable between 1940 and 1944 and was also *essential* if Britain's continued participation in the war was to have credibility in the eyes of the British people, in the eyes of the Germans and in the eyes of Britain's allies. It is also my belief, however, that *morale,* so far from being Germany's weak spot, was just about the worst target to attack *explicitly.*

Once more, a bad misreading of World War I was having a serious delayed effect. The British at all levels, in their horrified recoil from the heavy losses between 1914 and 1918, had come to believe that these were due mainly to the idiocy of their generals. They were nothing of the kind; *our losses were caused by the German army,*

whose main body the BEF had engaged for three hard years. It was an army which, for most of that time, displayed very high quality indeed, and most of which maintained its morale to the end under fearful pressures. And it was a conscript army, which means that it reflected the character of the people from whom it sprang. The same was true of its successor between 1940 and 1945; the morale of German civilians, like the morale of the German army, remained steadfast to a point beyond all expectation.

There is, I fear, one more aspect of the bombing offensive which grates on me. Both the Air Staff and successive AOCinCs of Bomber Command – but none more loudly than Sir Arthur Harris – complained constantly of what they called 'diversions' of the Command to what they seem truly to have believed were fringe activities. Harris, at the end of 1942, suggested to Churchill in all seriousness that all British bombers should be brought back from the Middle East, and that every possible bomber should be obtained from America (irrespective of American needs). He even proposed that Stalin should be urged to send the Soviet bomber force across to operate from Britain. And worst of all, because it was marginally more practicable, he demanded that all suitable aircraft should be transferred from Coastal Command, which he chose to call 'merely an obstacle to victory' – and this, you will note, at precisely the moment when Coastal Command was at last becoming an effective U-boat killer. I made a list of the chief 'diversions' that the bomber prophets so strongly objected to, giving reasons for each one of them – and I concluded that you could sum them up succinctly and accurately as 'the war itself'. Indeed, I felt compelled to remark, '... it is at times difficult, taking into account the ineffectiveness of Bomber Command's 'proper' activity, and its strong resistance to all 'improper' activity, to decide whether it is more correct to say that Bomber Command was irrelevant to the war, or the war was irrelevant to Bomber Command.' I have already drawn attention to the undesirability of being irrelevant.

I now come to a very different but highly effective style of warfare which its most distinguished practitioner called 'air warfare in its own right'. He was Sir Arthur Tedder, who emerges to me as the outstanding airman of the war, with the largest view of its conduct. This is not surprising; Tedder's Middle East Command was quite

unlike the functional metropolitan Commands – *it was itself an air force.* It contained something of everything because it had a use for everything, so naturally Tedder's view was different and generally larger than that of the Home AOCinCs. He expressed it very clearly in a letter to Admiral Cunningham, commanding the Mediterranean Fleet, in the course of a lively dispute in June 1941. Tedder said:- 'In my opinion, sea, land and air operations in the Middle East Theatre are now so closely inter-related that effective co-ordination will only be possible if the campaign is considered and controlled *as a combined operation* in the full sense of that term.' This was a view from which Tedder did not depart. In 1944 he is on record as saying:- 'I do not myself believe that any modern war can be won either at sea or on the land alone or in the air alone ... war has changed to three-dimensional, and very few people realise that.'

This perception drew Tedder towards another of the greatest importance, which crystallised in the dark days of the Middle East in 1942. I have summed it up like this:- '... the war was driving home the lesson that when critical land operations are in progress, army co-operation is not simply a specialised activity of part of an air force. It is the function of *the entire force with all its available strength.*' Operation OVERLORD illustrates this perfectly. I have mentioned Coastal Command's part in it; Bomber Command (in conjunction with the United States Strategic Air Force) took on a number of vital roles, including the isolation of the whole Normandy battle area by interdiction; and the Tactical Air Forces 'saturated the battlefield with air power' as the Germans themselves had done in 1940.

These two perceptions – that the war was a combined operation, and that the combination might well require the entire available strength – seem to me to be of the highest quality. Tedder added another. From December 1941 onwards the war in the West was a *coalition war* again, subject to all the searching disciplines of such. Britain in World War II, threw up three great coalition commanders; Lord Alexander in Italy, Lord Mountbatten in South-East Asia and Tedder, who became General Eisenhower's Deputy Supreme Allied Commander in 1944, having already shown himself a true coalition leader in the Mediterranean theatre.

I have mentioned tactical air forces, a name first heard in January, 1943. It was under Tedder and Air Mshl Sir Arthur Coningham that

the long-neglected art of Army Co-operation was revived in the desert and, with the addition of some valuable work by Army Co-operation Command in England, evolved into a fairly exact science as practised by the tactical forces.

We dwell too much, I think, on D-Day and the Normandy beaches. We should think more about what made D-Day possible, and it is difficult to call to mind anything more important for that than the nine-week campaign conducted by the Allied air forces – at a cost of 12,000 casualties – before the sailors and soldiers ever approached the Normandy coast. Once the battle ashore was launched there were very few days indeed, in a very bad summer, when the tactical air forces did not fly in support of the armies. When the Germans made their last counter-attack – at Mortain in August, 1944 – the tactical forces, in Coningham's proud words, 'made air history'. The counter-attack was smashed and it was, he said, 'proved that a tactical air force may be a decisive battle winning factor.'

What the RAF achieved in Normandy was an outstanding triumph of air power within a combined operation. I said in my conclusion:- 'It was air power that paved the way into Europe; air power covered the landings and made it impossible for the Germans to concentrate against them; air power maintained interdiction and pressure on the enemy when the 'master plan' failed; air power completed the overwhelming victory.' So we see how, *per ardua,* the RAF returned to its original purposes; how it lent wings to the victories of the Navy and the Army, and in so doing, I firmly contend, placed itself at 'the right of the line'.

MEETING ON 14 MARCH 1988

Introduction by Air Chief Marshal Sir David Lee

I was Secretary to the Chiefs of Staff during part of the period we are considering this evening and relations between the Chiefs of Staff and Mr Sandys were, not to put too fine a point on it, uneasy. He did not like having to deal with a number of important, powerful, military officers. He wanted to talk to one person and it was simply the Chief of the Defence Staff. The three Service Chiefs still had immense responsibilities and he did not like having to deal with this very powerful committee and so, during that period, there was a bit of wishful thinking and a whispering campaign was going around the corridors of power which said the time of Sandys was running out!

Now we are very fortunate this evening to be able to have this talk from Mr Cecil James whom I have known personally for something like thirty years or more. He has had a long and distinguished career in the Civil Service, most if not all of which has been in connection with the Royal Air Force, either in the old Air Ministry, the Ministry of Defence, or in the Far East. Since retiring, Cecil James has written a book which is entitled *Defence Policy and the Royal Air Force 1956-1963*. Unfortunately for most of us it is a classified document and presumably will remain so for some time to come but I mention it because it does illustrate what a very deep knowledge of this particular period in Defence Policy he has, and I think we can now look forward to a most interesting and accurate account of the very controversial events of those days. Without further ado, may I introduce Mr Cecil James.

THE IMPACT OF THE SANDYS DEFENCE POLICY ON THE ROYAL AIR FORCE

by T C G James CMG MA

No Defence White Paper has been more eagerly awaited than that which Mr Duncan Sandys presented to Parliament in April 1957. The threat from nuclear weapons, which the White Paper described in apocalyptic terms yet with an insistence that these nevertheless offered the best hope of avoiding global war, led to intense public debate on the morality as well as the merits of what was seen as a new deterrent policy. How far this policy was new is one of our themes. What was certainly new was the intention to abolish National Service, which meant that the manpower strength of the Services would be virtually halved over the next five years. This was not all that significant for the Royal Navy; on the other hand, the future role of the Navy was less than clearly defined in the White Paper. The army faced major reductions in its fighting strength and thus the difficult task of disbanding or amalgamating units with long and proud histories. Its commitments in Europe and outside remained; but it was going to have less with which to meet them. The Royal Air Force was the most curiously placed. On the face of it, it was not undervalued. The Prime Minister, Sir Anthony Eden, who had just departed the scene, had appointed Sir William Dickson the first Chairman of the Chiefs of Staff Committee because, he said, 'the RAF must play an increasingly important part in our military scheme of things in future.' The 1957 White Paper confirmed the RAF as the custodian of the key component of the deterrent policy. Such argument as Ministers allowed themselves was about the size and equipment of the V-bomber force, not about the need for it. On the other hand, the logic of nuclear deterrence, coupled with foreseeable developments of both offensive and defensive missiles, was widely construed as the beginning of the end of the military aeroplane.

So the 1957 White Paper was a major event. But the shadows had been cast before. How far back they had begun to loom is arguable. It is said that a day or two after Sir Winston Churchill returned to office in October 1951 he was being driven along Horseguards Avenue on a Sunday. The massive doors at the north end of what is now the MOD Main Building were shut. Sir Winston glowered at these new, and no

doubt expensive, structures and said to his Private Secretary: 'This is what we have come into power to stop, Socialist extravagance.'

Whatever hopes the Services might have had that they would be generously treated by the new government were soon disappointed. The chill wind of economy blew from the beginning. We certainly felt it in the Air Ministry where Lord de L'Isle and Dudley took over as Secretary of State. One distinguished air marshal, very distinguished indeed, is said to have thumped the table and said that he was not going to be told how to run the Air Force by a guardee peer, only to be reminded by the Permanent Under-Secretary that the guardee peer was also a chartered accountant. The need to achieve a better match between defence expenditure and economic capabilities was recognised in successive Defence White Papers up to and including that of 1956. The 1956 White Paper came out a few months after the appointment of a new Minister of Defence, Sir Walter Monckton, whose brief according to his biographer 'was to devise a method by which the figure of £1,500M spent annually on defence could be substantially reduced.' We can regard this White Paper as the beginning of a political process which led directly to the 1957 White Paper and which had important consequences for NATO as well as for British policy. It set out the roles of the Services like this:-

a. They must make a contribution to the Allied deterrent commensurate with our standing as a World Power. This means not only building up and maintaining a nuclear stockpile and the means of delivery, but also contributing to the maintenance of NATO's defensive effort by land, sea and air.

b. They must play their part in the Cold War. By their mere presence they can contribute to the stability of the free world and the security of overseas territories whose peaceful development may be threatened by subversion whether overtly Communist or masquerading as nationalism.

c. They must be capable of dealing with outbreaks of limited war should they occur.

d. They must also be capable of playing their part effectively in global war should it break out. They will have to include support to the civil authorities.

It is clear from the White Paper and elsewhere that these roles were to be understood as an order of priority. It is also clear that preparations against a global war, including substantial investment in civil defence, even though these were the lowest priority were having an important and expensive influence on the Services' programmes. This is not to say that separate ranges of equipment were regarded as necessary for the separate roles; some capabilities were obviously relevant to more than one role. But it was no less obvious to the Ministers who mattered most – the Prime Minister, the Chancellor (Mr Macmillan) and the Minister of Defence – that the budgetary and economic implications, if the Services continued at anything like their present size and shape, were unacceptable. Defence was getting too big a share – of money, production, scientists and engineers, and manpower in general. A key date in this pre-Sandys period is 20 March 1956 when Macmillan and Monckton sent a joint minute to the Prime Minister. They expressed their concern at expenditure on defence measures that were 'little more than a facade'. They called for 'a reappraisal at the highest level of the whole basis on which our defence policy should rest.' They posed a number of basic questions, the thrust of which was to minimise expenditure on fighting a major war in favour of a policy of nuclear deterrence. As the National Service Act would expire in 1958 there was no time to be lost.

Ministers eventually got down to the task in June when they were presented with a far-reaching memorandum on 'The Future of the United Kingdom in World Affairs', to quote its title: not one, we must note, produced by the Chiefs of Staff even though it had been triggered by doubts about defence policy. It was the work of a small group of senior officials, commissioned by Sir Norman Brook, the Secretary of the Cabinet. He seems not to have told the Chiefs about it. At any rate, Mountbatten wrote to Monckton some time after the group had begun its work. He said the Chiefs had heard that 'some form of committee is being set up to advise the Government on the general policy to be followed in future ... such a wide survey of policy must include the defence aspect and we are gravely disturbed that our constitutional responsibilities to advise the Government are being by-passed.' Monckton gave him very little change: Ministers alone would consider broad aspects of policy before more detailed areas such as defence were addressed. Norman Brook might have given him even

less change. Even on the broader issues of defence, let alone national policy, he was wary of leaving the initiative to the Chiefs of Staff. When a Future Policy Committee was set up a year or so later, Brook deliberately designed its framework of studies in such a way that, as he put it, 'the Chiefs of Staff could not take the bone away and gnaw it in a corner by themselves.'

Copies of the report by Brook's group of officials landed on the desks of the Chiefs of Staff on 6 June. It was scarcely a coincidence that the first meeting of the Policy Review Committee that the Prime Minister had set up, in response to the pressure from Macmillan and Monckton, was held that same day. The Brook group paper was the only one considered by the committee; and the Chiefs of Staff were not present. It all seems to have been carefully contrived to ensure that it would be Ministers only who had the first gnaw at the bone.

Not that the bone was all that appetising. The memorandum was a notably perceptive appreciation of the national condition. It identified the two main factors that called for a thoroughgoing review of policy and identified both the policy objectives and a programme of studies designed to produce answers to questions of defence as well as the civil sector. The two factors were put like this:-

a. The external situation confronting us has changed. The hydrogen bomb has transformed the military situation. It has made full-scale war with Russia or China unlikely. And conventional forces, though still of great importance in some situations, have become a relatively less important factor in world affairs. The Russians have recognised this change, and they are adapting their actions to it. While their objectives may remain unaltered their methods of attaining them are changing. We must modify our own tactics accordingly.

b. It is clear that ever since the end of the war we have tried to do too much – with the result that we have only rarely been free from the danger of economic crisis. This provides no stable basis for policy in any field. Unless we make substantial reductions in the Government's claims on the national economy we shall endanger our capacity to play an effective role in world affairs. Only thus shall we be able to find the means to place our economy on a stable basis and to counter the new forms of attack with which

we are being confronted.

Of the defence imperatives in the memorandum, first and foremost was the need to apply the logic of nuclear deterrence to NATO policy, which meant that the British conventional forces in Europe should and could be substantially reduced. The overseas situation outside NATO called for different treatment but there too garrison forces and contributions to the Baghdad Pact and SEATO could be reduced; improved air transport was the key to economy. Another emphasis we should note was on home defence; was the United Kingdom defensible in any real sense? At a meeting of senior Ministers even before the Policy Review began Mr Macmillan said that the sensible, though difficult, decision for the government was the abolition of Fighter Command. This could not be done immediately but in his view the Hunter and Javelin should be the last aircraft for UK defence; the case for a more advanced fighter should rest on overseas needs and those of the Navy.

The Prime Minister was anxious to move quickly. Numerous papers were commissioned by the Policy Review Committee, on all aspects of defence as well as on the economic situation, with the aim of completing its work by the end of July. The Committee was hard at it in June and July; nine meetings in some seven weeks. It was due to hold its tenth meeting on 27 July but on the 26th Nasser announced the nationalisation of the Suez Canal and the meeting was cancelled. The Policy Review Committee did not meet again until December. So Suez had two consequences affecting the 1956 Review. It meant that much of the earlier impetus was lost and that the case for radically revising defence policy was even stronger. But the main issues were identified.

The first was the need to persuade NATO Allies of the overriding importance of nuclear deterrence, which called for a new NATO strategic concept: ‘one’ said the Brook official group, ‘that can be interpreted in terms of lower but militarily definable force levels, and a planned and coherent Allied effort ... it might perhaps be based mainly on the idea of a ‘plate-glass window’ or ‘trip-wire’.’ Is then this memorandum the origin of ‘trip-wire’ both the term and the strategy? Whether or not this is so, the fact is that a diplomatic offensive was launched in the last few months of 1956 to persuade

first the United States and Canada and then the other NATO Allies to adopt a new strategic concept.

And it was successful, up to a point. A new NATO directive was agreed at the NATO Council in December 1956, ambivalent in some respects, not wholly accepted in all its possible implications, positively disliked by SACEUR and SACLANT ('as of now I hate the British', said General Gruenther on one occasion), but nevertheless providing British Ministers with the rationale they needed for making major cuts in BAOR and 2TAF. It was to provide later a rationale for a determined attack on Air Staff plans for air defence of the UK. Even the British nuclear deterrent force was not to be sacrosanct. Sign, visible though it was, of the government's convictions, it was already in some danger. Macmillan, as Chancellor, thought it larger than necessary. The current plan was for a front-line of some 200 V-bombers; he thought 120, or even 100, would be enough. And neither Mountbatten nor Sir Gerald Templer, the CIGS, were at all convinced by either the concept of the new strategy or its consequences for conventional forces. They thought that the government had got the priorities the wrong way round. The first thing to settle was the size and shape of conventional forces for commitments within and outside Europe; only what might be afforded, after that had been done, should be allotted to nuclear forces. Moreover, they were concerned about the risk of conventional war in Europe once Russia had achieved nuclear parity with the West. CAS, Sir Dermot Boyle, totally disagreed and this disagreement among the Chiefs had to be exposed to the Defence Committee during the 1956 Policy Review. The view of CAS prevailed, as it did when the issue was again put to ministers in 1957 and 1958. Unfortunately, to win is not necessarily to be popular. Teacher's pet tends to get beaten up in the playground; and I feel bound to give you my personal impression that the extremely rough ride the RAF was to be given during the rest of the fifties can be ascribed in part to a feeling in some quarters that the junior Service had been getting too big a share of the cake.

The last question before we get on to the impact of the Sandys policy itself, is – how did the Air Council respond to the turbulence of the last six months of 1956? This has to be done to reach a judgement on how far Mr Sandys was innovator as well as architect. The Air Staff warmly welcomed the memorandum of the Brook official group,

especially the case it made for a new strategic concept. The Air Council was in fact ahead of the game; it had put in hand a study of the future Air Force early in 1956. This was discussed by the Air Council in June 1956. It might well have startled the Air Force at large. As compared with the existing plan for a V-bomber front-line of 200, the study saw this falling to 100 as the BLUE STREAK missile came into service and did not rule out eventual replacement of bombers by ballistic missiles. Fighter Command would come down from currently some 500 aircraft to 200 in phase with the introduction of SAM missiles, and after the middle sixties SAM would be the predominant weapon for air defence. The Command was perceived as primarily a contribution to the nuclear deterrent. But another fighter beyond the Lightning was envisaged, as indeed was a successor to the V-bombers to ensure against slippage in the ballistic missile programme. No role was allotted to the air defence fighter in Europe. Nothing emphasises more clearly the extent to which the Air Council was convinced that most of the eggs should go into the deterrent basket than what was in mind for 2TAF: a cut of two-thirds in its existing strength of some 400 aircraft, with the residue entirely devoted to strike and reconnaissance: no fighters, no helicopters for army support. This disbelief in preparations for a serious conventional phase was reflected as well in the outline plan for Coastal Command, which the Air Council saw coming down from some 70 aircraft to 36 – six squadrons. Overseas, Middle East Air Force would remain at its present strength but Far East Air Force would be little more than a token presence. Reinforcement from the UK would be part of the answer if there was serious trouble overseas; another part – interesting in view of later developments – would be a mobile striking force based on carriers. The Secretary of State for Air, Nigel Birch, is recorded as expressing ‘considerable apprehensions’ at this particular notion. Logically, this view of policy for the Air Force overseas demanded a bigger Transport Command. The first orders for the Britannia had been placed in January 1956 and a substantial force was planned. The last point to stress, and we must remember that all this was before the 1956 Policy Review Committee began its work, was that the Air Council assumed that National Service would be abolished.

In broad terms, and in many details as well, these Air Council

discussions in the summer of 1956 were in harmony with what finally emerged at the end of the year from deliberations of the Policy Review Committee. Mr Antony Head (who had replaced Sir Walter Monckton) proposed as follows:-

- Fighter Command and 2TAF to be halved.
- Bomber Command restricted to 184 V-bombers.
- What was described as a 'small force of MR aircraft in Coastal Command or overseas'.
- A stronger Transport Command.
- Small tactical air forces as contributions to the Baghdad Pact and SEATO.
- A smaller fleet, with no more than two fleet carriers and a light carrier; the South Atlantic, American and West Indies stations abandoned.
- A smaller army, with BAOR coming down from over 80,000 to 55,000 and possibly less.

The manpower allocations were 90,000 to the Navy, 200,000 to the Army, 155,000 to the RAF: some 450,000 in all, with National Service assumed to continue on the basis – so Antony Head proposed – of a ballot. All this was sufficiently accepted for Ministers to tell their American colleagues and SACEUR and SACLANT of what they had in mind. But no final commitment had been made, certainly none to Parliament and the general public, before Sir Anthony Eden resigned. Eden himself had wanted to get rid of National Service; and much work had been done during 1956 on the maximum strength of forces that could be sustained by all-regular recruitment. About 350,000 seemed to be the best guess, compared with the 450,000 in Head's final proposals.

Comprehensive national service produced larger drafts than would be required to meet this gap of 100,000. So the question of a selective draft had to be addressed. The problem for Eden was that he saw great political difficulty in providing a method which the country at large would regard as fair. A Premium Bond Lottery was one thing; a ballot to decide who should or should not be called up was a different proposition.

National Service was thus the first issue that had to be settled when Mr Macmillan became Prime Minister in January 1957; to embark on size and shape exercises for the front-line strengths of the Services would otherwise be pointless. Amongst the first actions of Mr Macmillan, having selected Mr Sandys as his Minister of Defence, was to give him a directive requiring him as his first task 'to formulate in the light of present strategic needs a new defence policy which will secure a substantial reduction in expenditure and manpower.'

What we shall now be dealing with is, first, the National Service question; secondly, strategic deterrence and the associated force plans; air defence; Coastal Command; and finally the air transport force against the background of the government's attitude to overseas commitments outside the NATO area. There will not be time to deal with the RAF's administrative problems, severe though they were.

Defence White Papers are usually published in February; the Sandys White Paper came out in April. Difficulties over National Service explain some of the delay. Collectively the Chiefs of Staff believed that the Services would not be able to meet the current commitments to NATO, or maintain adequate garrisons, with manpower of less than 450,000. Mr Sandys was quite unimpressed. The Navy, under the 450,000 scheme, was claiming a four-carrier group force, bigger than Mr Head had proposed. The Army would have to reduce BAOR by one division but it was with at least this kind of reduction in mind that Ministers had painfully negotiated the new NATO policy directive. The Air Force component assumed that 2TAF would be halved in little more than a year but the Air Council itself envisaged further reductions later on. In any case, taking the view as he did that it would take five years to achieve all-regular forces, Mr Sandys reasonably doubted whether there would be any significant difference between a 450,000 force including national servicemen and all-regular and more efficient Services of around 370,000. So, in mid-February he told the Chiefs of Staff to examine the implications of a force of that size. This was a rebuff for the less radical members of the government. Lord Salisbury had submitted a paper to the Cabinet in January advising that a limited National Service intake would be required until at least 1965. I have found no record of it ever being discussed in Cabinet. Indeed, the unhappily strained relations that developed between Mr Sandys and the Chiefs were as much the result

of the way defence business was being conducted as of differences over policy. At what was a crucial meeting of the Defence Committee on 27 February the Chiefs of Staff's memorandum arguing the case for 450,000 manpower was not presented; the Committee at Mr Macmillan's direction considered only the aim of achieving all-regular forces by the end of 1962. After that meeting the Defence Committee, which usually met every two weeks, was not to meet again until July.

There is no doubt that the Chiefs of Staff were deeply disturbed by what seemed to them a failure to use the normal procedures for their relations with and access to Ministers collectively. They continued to maintain that 450,000 was the lowest acceptable strength and they formally represented that a serious constitutional issue would arise if the White Paper gave the impression that the economies were justified on military and strategic grounds and were therefore acceptable to the Chiefs. Yet in the view of the Air Staff the case made for a 450,000 force was itself flawed: 'not a logically concerted paper which first establishes the essential strategic commitments and then estimates the forces needed to meet them.' This reflected a concern that an essentially deterrent policy might not be thought through and applied as rigorously as it should be: misgivings that were not misplaced.

So it was against their advice that the Chiefs were required to structure the Services within manpower of some 380,000: 80,000 to the Navy, 165,000 Army, 135,000 RAF. Compared with the 450,000 figure the Navy would have to reduce from 150 to 130 fighting ships, including three rather than four carrier groups; the Army from 136 to 118 major units. RAF force plans showed little change. The Air Council felt that it had already proposed a minimum force and that it would somehow have to use its reduced manpower more efficiently. They could be excused from thinking that the Air Force was less vulnerable to pressure since their views on the deterrent concept and its implications were similar to those of Mr Sandys. The most vivid expression of that concept is to be found in the 1957 White Paper: 'the overriding consideration in all military planning must be to prevent war rather than prepare for it.' The Chief of the Defence Staff tried to persuade Sandys to leave it out because it was liable to be misunderstood in NATO. Sandys left it in precisely because it was the crux of the case for cutting back in Europe. His convictions about nuclear deterrence were argued with typical obstinacy, against

opposition at home as well as in NATO. He would not be moved on the concept and he must have been disappointed that he was not wholly successful in persuading others, particularly in NATO, to attach less importance to conventional defences. This was why the first tranche of BAOR reductions was no more than 20,000; a second and later reduction brought the force down to 55,000. It has stayed there or thereabouts although the 1957 intention was to bring it down to 45,000, possibly even less: 2TAF, in contrast, was very rapidly reduced: to just over two hundred aircraft by March 1958. The Air Council's plan to come down to a smaller strike/recce force was scheduled for completion in 1961. That in the event a fighter component was retained, although the intention to remove it was declared to NATO in 1958, is a story that lies outside the period. None of this was at all easy to negotiate; German Ministers were particularly concerned at the reductions. Sir Frank Roberts, the Ambassador to NATO, put his finger on the root difficulty in his annual report for 1957: 'NATO is mainly interested in our presence in Europe and not so much in our responsibilities in the Middle East or Asia, nor even in our possession of the major deterrent ... the United States contribution to the deterrent is generally considered to be enough for the Alliance as a whole.' Sandys was unshaken. He delivered a stern lecture to the NATO Council in December 1958. Britain was spending more on defence than any of the European allies, partly because of its commitments outside Europe. These, however, had the same purpose as NATO itself in containing Russia. 'It is essential', he said, 'to ensure that our flank in the Middle East and beyond is not turned.' As for the ultimate sanction, this would remain valid even when Soviet nuclear capabilities matched those of the West. But there were two conditions: the deterrent should be so organised that it could not be destroyed in a first strike, and the Russians should not come to think that the West no longer had the courage to use it. And the British were determined to be involved; he said that most of the aircraft in an initial retaliation would be British.

The V-bomber force was, it seemed, to have priority; and it did, despite the protests of Mountbatten and Templer. Yet Mr Sandys could not wholly defend the frontline of 184 aircraft which was called for in the latest Air Council plans. What he secured at a meeting of the Defence Committee in August 1957 was a frontline of 144, most of

which – 102 – would be Mk 2 Vulcans and Victors. The Air Staff were not too disappointed. The Mk 2 V-bombers were the crucial element. With BLUE STEEL Mk 1 already under development, to be succeeded by the much more capable Mk 2, a credible airborne deterrent could be poised until well into the 1960s. Moreover, by 1957 the advent of a missile component in the deterrent had come much closer. Whereas nobody expected the British BLUE STREAK to be in service until some time in the '60s, the American Thor was just over the horizon.

The possibility of deploying Thor in Britain had emerged in 1956. Ministers were in favour from the outset; the Air Staff were not so convinced, mainly because they thought they were being rushed into accepting what even the Americans regarded as an interim, first-strike weapon and one whose technical provenance left something to be desired. Nevertheless, President Eisenhower and Mr Macmillan reached agreement in principle at the Bermuda Conference in March 1957 and from then on things moved quickly: first to an intergovernmental agreement in February 1958 which settled the number of missiles to be deployed – sixty. A training and deployment programme was successfully completed before the end of the decade; an extraordinary achievement by the two Air Forces and especially by Bomber Command. We have to leave it there. The opportunity to hear much more about the history of the nuclear deterrent will come in next year's Society programme. But a final point: as Thor came closer to deployment the possibility was discussed of substituting it for BLUE STREAK. Give it a British warhead, emplace it underground and the Americans might then give up operational control of the weapon and we would still have an independent deterrent and save the expense of developing BLUE STREAK. The detail of this episode and the history of the demise of BLUE STREAK must be left till another occasion.

A diversified deterrent – manned aircraft with air-to-surface weapons and ballistic missiles – was in prospect. But it was not cheap, particularly if BLUE STREAK remained in the programme and also if what Sandys had told NATO was essential for effective deterrence was taken seriously: the operational credibility of the deterrent force. Sandys certainly took this seriously, as did Bomber Command; hence the expensive scheme for widespread dispersal airfields, overseas as well as at home, and the quick reaction procedures which Bomber

Command perfected and demonstrated in training and exercises. Sandys was determined that the deterrent should be seen to be effective as well as politically independent.

But now to air defence, where his attitude to RAF plans was very different. Nobody, the Air Staff included, was in any doubt that Fighter Command's 1956 strength was insupportable. But even when, as the Air Staff planned, this was reduced to twenty squadrons, plus three overseas, there was formidable opposition on both conceptual and financial grounds. As early as March 1957 Mr Sandys cancelled all work on OR329 – the all-weather interceptor to succeed the Lightning. Not that this meant that the Lightning as a weapon system was unthreatened. Orders for the Lightning Mk 1 had now been placed but it was the Mk 3, with first Firestreak and then RED TOP air-to-air missiles, that the Air Staff had in mind for the twenty-squadron force. Doubts about the extent of investment in UK air defence had been voiced, as you have heard, in 1956. What we can regard as beginning an exhaustive and exhausting review was a minute from Mr Macmillan to Sandys in August 1957: What is the threat over the next ten years, the plans for meeting it and the military arguments on which they are based? – these were his questions.

First, the threat as the Air Staff and the Joint Intelligence Committee assessed it: up to 1960, from nearly 300 Badger medium bombers backed by a large nuclear stockpile: from 1960 a similar weapon to BLUE STEEL Mk 1 would come into service and so would ballistic missiles with the range to reach Britain but probably not with the accuracy to eliminate missile sites. These could well be targets still allotted to bombers. Sometime in the mid-1960s a new Soviet strategic bomber could come into service: quite an aeroplane – combat radius with flight refuelling of 3,500 miles, cruising at 1.7 Mach, 200 mile dash capability of Mach 2 at 60,000 feet. No hard evidence, I suspect: a hypothetical aircraft which I doubt has materialised even now. But a belief in a continuing threat from the manned bomber to the UK-based deterrent forces was one reason for the Air Ministry's persistent defence of a substantial force of air defence fighters.

Next, the plans for meeting the threat: twenty squadrons, SAM defences – at their peak amounting to 700 launchers, over one hundred with nuclear warheads on a developed Bloodhound Mk 2 – and air-to-air weapons which included the nuclear-tipped Genie to be obtained

from the Americans; and, underpinning fighters and missiles, a modernised control and reporting system. A costly programme, estimated to be more in the period from 1957 to 1962 than would be spent on Bomber Command. 'It can be justified,' said Mr George Ward the Secretary of State for Air, 'only if we can show that it makes all the difference to the success of the deterrent.'

And the military arguments: these were as much psychological and political as military. There was a real difficulty. The size of a deterrent force could be quantified by reference to whatever criterion of damage to an aggressor was selected. It was much more difficult to demonstrate that a particular scale of air defence was necessary to implant doubt in an aggressor's mind about his ability to neutralise the nuclear strike forces. And that was the object: doubt, not effective defence against an actual attack.

It was not until 1960 that the size and equipment of UK air defence was determined, at any rate for the next ten years: five squadrons only and no SAM units. The catalyst at that time was a report by the Joint Planning Staff (JPS): Sir Fred Rosier, who is here this evening, was the JPS Chairman. The views of the JPS were much the same as Mr Sandys had argued in 1957, with support from other Ministers. Mr Watkinson, Mr Sandys' successor, was at least as determined to economise in air defence. From the beginning of this lengthy debate Mr Sandys doubted whether fighters were needed to protect the V-bomber airfields. He argued that the Soviet Union would not mount an attack against this country until it could simultaneously destroy nuclear bases in the United States. If ever that was possible, it would certainly not be until well into the sixties, and the weapons would be ICBMs to which fighters were irrelevant. As for SAM defences, ministerial opinions oscillated in the late fifties. Sandys himself doubted their value, as he did, and others beside, the practicability of effective ABM defences. Just before one of the numerous Defence Committee meetings at which air defence was on the agenda the *Daily Express* printed an article by Chapman Pincher which questioned the value of SAM. It was noted in the Air Ministry that he and Mr Sandys had lunched together the previous day. What mattered most to Sandys was V-bomber dispersal and QRA; and BLUE STREAK emplaced underground as well. He continued to argue for BLUE STREAK even after the Air Staff had accepted defeat, and the Chiefs of Staff had

unanimously and categorically disowned it as being only a first-strike weapon. This view is arguable but not perhaps tonight.

The Air Ministry fought a good fight for a bigger fighter force than the government was prepared to concede. Closely argued papers were produced on both sides of the debate; rightly so, but what was hard to bear was the absence of what Sir Dermot Boyle called 'the same thoroughness, the same objectivity' in analysing the programmes and policies of the other Services. Which leads us to look next at the maritime scene and Coastal Command.

To begin with, Mr Sandys accepted his predecessor's proposals for a smaller Navy: three carriers only and manpower limited to 80,000. The 1957 White Paper showed uncertainty about the Navy's NATO role, though it stressed its value for limited war outside the NATO area and in peacetime emergencies. For the Air Ministry, Coastal Command came last in its priorities and it planned to reduce it to six squadrons. The battle then commenced; and after intense lobbying the issues were presented to the Defence Committee in November 1957. An Admiralty paper scarcely troubled to conceal its distaste for a nuclear deterrent policy and argued for a four-carrier group fleet. Yet in drawing attention to losses at sea during 1943, inflicted by a German submarine fleet substantially smaller than the Russians could deploy, it might well in objective terms have destroyed the naval case for a bigger North Atlantic presence. It seemed nonsensical to the Air Ministry to get excited about the need to protect convoys; if this was to be taken seriously it postulated a conventional campaign, in which case strong air defences would be needed to protect the ports and anchorages for the convoys. And strong air defences were unlikely to be conceded. Nevertheless, Mr Sandys shifted his position towards the Navy. He agreed to a fourth carrier group, with an emphasis on ASW capability in the Atlantic, and allowed the Navy extra manpower above the original White Paper allocation – 88,000 instead of 80,000. And even before the meeting of the Defence Committee was held he had arbitrarily instructed the Air Ministry to plan on the basis of eight and not six Coastal Command squadrons. The Air Ministry protested: 'such an increase would be inconsistent with approved strategic priorities, and it would not be militarily significant, bearing in mind the size of the long-range maritime forces which it was necessary during the war to deploy against a submarine threat nowhere

approaching in numbers or in quality the threat which confronts us today.' It did no good; the instruction to plan for eight squadrons was soon turned into an order actually to maintain that number.

This was only the first phase of the battle. The second was even more worrying for the Air Ministry. In the first half of 1958 speculation began about the transfer of Coastal Command to the Admiralty: speculation in the Press, questions in Parliament. When this had last been discussed – in 1954, when the decision was to leave well alone – Mr Sandys had been in favour of transfer; and he put a re-examination in hand in November 1958. This second-phase battle lasted until the following July. It should never have been started; with all the turbulence in the Services, there could not have been a worse time for an inter-Service row. However, Mr Sandys made a mistake which was to prove crucial; he seems to have omitted to tell the Prime Minister. For some weeks he appeared to be getting his way. The Chiefs of Staff were evenly split; CDS and CAS were against change; Mountbatten was naturally in favour; CIGS – Field Marshal Festing – reluctantly supported Mountbatten, with some reservations. One reason for the CDS appointment was to have an adjudicator when the Service Chiefs could not agree; and having set out the reasons for making no drastic changes Sir William Dickson offered Sandys a way out. This was to revise the existing arrangements for control of maritime aircraft, placing CinC Coastal Command and his group commanders under the operational command of their Naval counterparts as deputies and not co-equals. But Sandys would not be put off. A report concluding that a case on merits had been made for transfer was considered by the Defence Board. From the minutes of the meeting one would think that the Air Force was on the point of losing. Mr Sandys could have claimed the support of the majority but his own summary at the end of the meeting was that while the case had been made he had been impressed by the effect of a transfer on the morale of the Royal Air Force. He had previously seemed impervious to precisely this consideration. Why did he change his mind? Sir Richard Powell, his Permanent Secretary, may have influenced him. What is certain is that the Prime Minister some time before had sent Mr Sandys a private minute to the effect – according to one account that this was not an appropriate time to change the status of Coastal Command, or more precisely – according to another

– that he did not wish the issue to be dealt with before a General Election (which took place in October 1959). It is no less certain that before the Defence Board meeting the Cabinet Secretary was being advised that the case for transfer 'had considerable failings and a fairly destructive argument against it can be produced by the Air Ministry.' Soon after that meeting Mr Sandys issued a directive which began with the statement that Coastal Command would continue as a separate Command. It had been, said the Cabinet Office, 'an unnecessary and deplorable exercise.' The outcome was not wholly satisfactory. The issue of principle was still open; more resources than the Air Ministry considered appropriate were allotted to the North Atlantic; and some basic questions of maritime policy were swept under the carpet, at least for the time being. But a decision had been reached. The Air Ministry put in hand a programme of Shackleton modernisation for a bigger Coastal Command and also a specification for a Shackleton replacement which led to the Nimrod. And changes in the command relationships which Sir William Dickson had suggested at the beginning of the controversy were introduced.

And so, finally, to air transport where policy was not bedevilled by such fundamental doubts as marked nuclear deterrence, air defence and the maritime scene. Improvements in air transport capability stemmed inevitably from a policy of reducing in Europe but, despite the cut back in Service manpower, maintaining an effective influence in the Middle East and Far East. The difficulties were recognised, whether contingencies arising overseas were limited wars in either theatre or the kind of emergency that was to occur over Kuwait. Mr Macmillan thought that 'with skill and ingenuity' British positions could be maintained. One of the keys to success was obviously more long-range capability and secure reinforcement routes. As things stood in 1957 neither was satisfactory. Mr Macmillan was very scathing about the inadequacies of the Hastings/Beverley force; and what was the determinant of the size of force required – the movement of a brigade from Britain to Singapore in seven days – could only be secure if Indian Ocean staging posts under firm British control were available. India and Ceylon were likely to refuse facilities if the emergency did not meet with their political approval. Gan was being prepared in 1957 to meet this need; the Air Staff would have liked another Indian Ocean staging post – in the Seychelles. Improvements

to Masirah in South Arabia also had route security in mind as well as V-bomber dispersal. Interestingly, HQ FEAF preferred Diego Garcia to Gan.

One of Mr Sandys' early decisions was to relax somewhat the requirement for Far East reinforcement. As then stated, this could be met by a force of twenty Britannias, plus a few Comet 2s. This was the first objective for an enlarged Transport Command. It was not achieved until the end of 1960, happily in time to make all the difference to the Kuwait Emergency in 1961. Amongst a number of industrial and technical difficulties, which resulted in only one RAF Britannia coming off the line each month, the crucial factor was the failure to secure big enough orders for the civil Britannia to justify a higher production rate. But the Britannia fleet was not the biggest of the problems. These derived more from what the Army began to demand, under three heads: a long-range strategic freighter, tactical transports and short-range transports, including helicopters. The War Office presented Mr Sandys in August 1957 with a demand for a long-range freighter capable of carrying up to 13 tons over a range of 3,000 miles. This was a much bigger requirement than anything previously stated. It coincided with the completion of studies of a Beverley replacement which pointed to an aeroplane of similar performance to the C-130 which had recently gone into service with the USAF. But at first this was considered too small for the strategic role and too big for the tactical. Moreover, the Army wanted the aircraft quickly: by 1963, by which time their manpower strength would have been reduced by National Service. So if it were to be British, aircraft developed for other purposes would have to be adapted; otherwise, it would have to be a foreign aircraft, which meant an American buy. The Air Staff came to favour a compromise: the C-130 after all, with the larger and more expensive C-133 another possibility.

The trouble was that the Army had moved the goal posts. A Chiefs of Staff sub-committee had earlier stressed the importance of stockpiling heavy equipment at the main overseas bases as a much cheaper alternative to carrying them about the world in large aeroplanes: heavy equipment such as armoured cars and the Thunderbird SAM, and also the BLUE WATER surface-to-surface missile (which was later cancelled). Since it was not agreed policy that tactical nuclear weapons such as BLUE WATER should be deployed

outside Europe, the case for a high-quality strategic freighter was not all that strong. With hindsight, the Air Ministry might have argued the case more than it did, especially as its budget made no allowance for a new strategic transport in the Army's time-scale. One could wish that Mr Sandys had thrown his weight about, as he did on other issues. As it was, he agreed that a new aeroplane was needed, and that neither the C-130 nor C-133 would be considered. But what British aeroplane? The various possibilities were examined throughout 1958: beef up the Beverley; a freighter version of the VC10; re-design the Britannia and give it rear-loading doors; a Handley Page freighter based on the Victor wing and tail. Then there was this turboprop aircraft, the Britannic, that was being developed in Belfast: good range, very good load, but a turboprop and slower than some of the other candidates. The Air Staff strongly favoured a turbojet and eventually persuaded the Air Council and Mr Sandys and the War Office to back the Handley Page aeroplane, the HP111.

The Cabinet, no less, decided the issue early in 1959. There can be no doubt that politico/industrial arguments were decisive. Shorts in Belfast was government-owned; the end of Britannia production was in sight; without a major order most of the labour force would have to be laid off. To select the HP111 would prolong the life of the company and hamper the policy of progressively rationalising the aircraft industry. A late entrant into the race, the rear-loading Britannia, was favoured by the Ministry of Supply as a useful and relatively inexpensive interim solution. Both Mr George Ward and Mr Sandys were advised to speak against it (*the HP proposal* **Ed**). So it was that the Belfast was ordered: at best, the Air Council's second choice; for which there was no allowance in forward costings; an untypical aircraft and highly unlikely to have a civil market; and with an engine (the Tyne) not in service elsewhere in the RAF. It made little sense in logistic and engineering terms. The VCAS of the day said, 'they will be obsolete when we get them.'

The background of policy to this unfortunate decision was the need to move reinforcements of equipment as well as men to deal with limited wars outside the NATO area. The War Office was also demanding more air transport within theatres. So in addition to unplanned expenditure on a long-range freighter, the Air Council found itself presented with a much bigger bill for tactical and close-

support transport aircraft than it had allowed for in its 1957 plans.

The scenario is important. War Office air transport requirements were for:

- a brigade group parachute drop;
- the move of two brigade groups in an overseas theatre within a fortnight;
- air supply of up to six brigade groups during the first month of a limited war.

The bill: an additional 75 medium-range aircraft (Argosies; and we haven't the time to examine why this aeroplane was chosen); at least another 200 short-range transports and helicopters, including 80 – a totally new requirement – for the Army in Europe. This bill was never met. It was excessive even if the scenario had remained unchanged; and it included expensive items such as the Rotodyne and Chinook-type helicopters. But the Air Council had to go some way towards meeting it. Some fifty Argosies were ordered and delivered and the Whirlwind force was usefully increased. What eventually reduced the War Office bill – and to mention this takes us outside Mr Sandys' time as Minister of Defence – was a revision of overseas policy by which the Army's commitments in the contingency of limited war were very substantially cut back. And behind that revision were growing financial difficulties and also doubts about the security of British bases overseas. Even so, the post White Paper insistence of the Army on maximising air supply to maintain itself in the field was one more factor affecting Air Ministry plans for the size and shape of the Air Force. Transport aircraft of all types in service in the early sixties were nearly twice as many as the Air Council had proposed in 1958. The number of helicopters trebled. With these changes came a change in the geographical deployment of the Air Force: fewer squadrons in Europe than had been planned and more overseas.

A very brief summary: looking on the one hand at the Air Force which the Air Council considered appropriate to a deterrent strategy and on the other, to that which was emerging when – nearly three years later – Mr Sandys ceased to be Minister of Defence, there had been several developments. A smaller, but still powerful, V-Force but with increasing doubts about BLUE STREAK, which the Air Ministry knew about and to some extent shared, and also about BLUE STEEL

Mk 2, which they may not have known. Polaris was beginning to be discussed though there was not yet what an Air Ministry official was to describe as a ‘Gadarene rush throughout Whitehall’. A much smaller fighter force: final decisions as to exact size not yet taken but the writing was clearly on the wall; indeed, the Air Staff itself had reduced its claim for a fighter force of twenty squadrons to twelve and also the size of the SAM force for UK Air Defence. Coastal Command was somewhat larger: not a wholly unpalatable consequence but the controversy about control of the Command had needlessly involved much time and effort. Developments in the air transport force I have just described. This increase was arguably greater than was strictly necessary; it was certainly financially embarrassing. It had been a difficult time for the Royal Air Force. The sad fact is that even more difficult times were not far away.

MEETING ON 20 JUNE 1988

Introduction by Air Commodore H A Probert

This evening we are returning to the air war in World War II, and this time we are going to look at it from the German side. Dr Boog, our speaker, is one of the leading air historians in West Germany. He came originally from what is today East Germany, from Leuna-Merseburg, where he obtained first-hand experience of Allied bombing. In 1944, at the age of 16, he underwent training as a glider pilot but then, instead of going on to the Heinkel 162 as had been intended, he found himself in the *Volksturm*, an experience which he fortunately survived. After the war he came to the West. He spent a short time as a translator and interpreter at Nuremberg and then went as an exchange student to the United States; one of the first exchange students to go from Germany to the USA in the late 1940s. Returning to Germany in 1950, he worked for the United States Air Force in Germany on intelligence duties until 1964 and also studied part-time at the University of Heidelberg where he obtained his PhD in 1965. Since then he has worked in the Military History Research Office in Freiburg, where the main research in West Germany into wartime history and the history of the post-war *Bundeswehr* takes place. His work has concentrated upon the air aspects of World War II and as Senior Air Historian he has contributed to the main writers' programme and also lectured extensively in and outside Germany. A major work which he has written is *German Air Force Leadership and Command, 1935-45*. He has also written on *The Strategic Air War and German Home Air Defence*, *American, British and Soviet Foreign Policy and Strategy, 1939-1943* and is co-author of a volume, *The Attack on the Soviet Union*: many more items have flowed from his pen. I personally, in my time as Head of AHB, have met him a number of times and it gives me great personal pleasure that he has agreed to come over and address our Society on the air war from the German standpoint.

THE POLICY, COMMAND AND DIRECTION OF THE LUFTWAFFE IN WORLD WAR II

by Dr Horst Boog
Chief Air Historian, West German Military
History Record Office, Freiburg

Mr Chairman, thank you very much for your kind introductory words. I consider it a great pleasure and an honour to be here, especially in view of such distinguished predecessors as Professor R V Jones and Mr John Terraine.

It is, I believe, not unusual that those who have lost a war are more critical of themselves than those who came out of it as victors. I shall, therefore, not concentrate on the strong points of the *Luftwaffe*, that is on its able application of technical principles such as the use of interior lines, mobility, concentration of forces at decisive points, surprise and successful co-operation with ground forces. I shall consider instead some special traits of the *Luftwaffe*'s command and leadership which constituted the basis, as well as the limits, of the performance of the German Air Force and turned out to be decisive and constituent causes of its defeat. Now this does not mean that without these particular characteristics the *Luftwaffe* would have won the war: it would have been out-produced anyway, but to crush it would have been harder, and maybe resistance to the war in the year 1939 would have been greater. Of these characteristic traits, which were most clearly reflected in the training of the general staff officers, I think five are important:

First, there was a gradual reduction of *Luftwaffe* leadership and command thinking to purely military aspects, in which the General Staff Officers certainly became specialists with great abilities although the principle of general assignability continued to be cherished by the General Staff theoretically. We shall see later that this reduction of scope did not solely follow from the fact that Hitler pressed for rapid expansion of the armed forces to make them ready for his war at the cost of shortening the training of the officers. During the war there was a further reduction of General Staff training to the needs of the routine work of troop staffs. The original objective of this training, the education of future Chiefs of Staff, was renounced as being no longer possible. Understanding the world outside Germany became

increasingly difficult for these officers, for other reasons too, such as punishment for listening to foreign broadcasts, and unclear conceptions about the outside world were the result. For instance, when Pearl Harbour happened nobody in the armed forces operations staff knew where it was located; I heard this from the Chief of the *Luftwaffe* Section. War conditions further led to a limitation of the experience of staff officers, because there was no time for familiarising them with other Service Branches or careers or theatres of war or even with the life of the troops at the front. Specialisation was the natural consequence and certainly the fastest way of getting results from these officers, though in limited fields.

This basis was too narrow to produce officers accustomed to think in terms of all the Services. As the last energies were mobilised towards the end of the war (it was already early in 1943) a further shift of values took place, from knowledge and ability to courage, bravery, resolution, youthfulness, belief in Hitler, and strong nerves as requirements for General Staff Officers. Irrational values were now to replace the rational approach to things which ought to have been the business of the General Staff and higher officers.

A second trait, of fundamental importance, was the over-emphasis on tactics and operations at the expense of the other spheres of command like logistics, intelligence, technology and signal communications, training and air transport. This attitude was called S3/A3 thinking. To become an operations officer, and eventually a chief of troop staff, was the goal of most General Staff Officers and for various reasons the *Luftwaffe* had relatively more S3/A3 positions than the other services.

Thirdly there was in practice, not in theory, underestimation of the importance of technology in relation to tactics and operations. While the first Chief of the *Luftwaffe* General Staff, General Wever, repeatedly stressed that tactics and technology were of equal importance, his third successor, Jeschonnek, in 1939 rejected the opinion of his engineers that technology was the basis of the *Luftwaffe* and that the technical superiority of the air force would therefore be decisive. Since all industrialised nations had reached about the same technological level, he argued, it was hardly possible to gain technical superiority for any significant period of time. It would be better to stress the development of air tactics, which were still largely

undeveloped. This would secure the *Luftwaffe* its superiority over the enemy in case of war. Later in the war it was exactly the temporary slight technical advantages that were decisive for the outcome of the air war. Suffice it here to add that technology was not in high favour among most officers and that engineers were often regarded by them with disdain, the whole situation being symbolised at the top by Goering who bragged about his technical ignorance.

The fourth trait was the doctrine of the offensive, which was valid until almost the end of the war. The first Chief of the *Luftwaffe* Staff regarded the bomber as the decisive weapon in the air, a conviction that entered into the basic *Luftwaffe* manual on the conduct of air war. He at first meant the heavy bomber, because he was influenced by Douhet. Later, in a realistic appreciation of Germany's situation, he favoured fast medium bombers, the operational radius of which was large enough to cover the necessary distances to the potential enemy capitals. Offensive thinking was conditioned by Germany's unfavourable geo-strategic situation in the middle of the Continent which required that the war be carried into enemy territory right from the beginning, to conquer, together with the army, a *glacis* deep enough to offer some protection against enemy air raids. That Hitler and Goering later developed ideas of the global use of very large bombers must be mentioned here although this plan was never earnestly pursued and never materialised. The idea that the country could also be defended by a strong fighter force was foreign to the German Air Staff because in Germany as elsewhere there was a strong conviction that an effective air defence against bomber raids was impossible.

Finally, and as already implied by the concentration of air armament on the medium bomber, it was the co-operative type of air war that prevailed, although the idea of the necessity of strategic bombing under certain conditions always existed latently in German air doctrine and came to the fore when the situation was considered favourable for it, as in the summers of 1940, 1941 and 1942. Indeed it had already appeared in late 1938 when Hitler ordered the quintuplication of the *Luftwaffe*, an expansion which was thwarted by the outbreak of war.

Offensive thought in the German Air Force did not follow the lines of Douhet but was generally orientated towards co-operation with the

ground forces and, theoretically at least, with the navy. Since experience in close air support was only gained during the Spanish Civil War, the *Luftwaffe* planners at first considered this type of air battle to be most difficult and therefore believed that the normal co-operative air war would comprise indirect missions in support of the ground forces against the rear areas of enemy forces, but within the zone of operation of army groups (*Operationsgebiet*). So they called this type of 'normal' air war '*operativer Luftkrieg'* (operative air war). The limits of *Operationsgebiet* were, of course, flexible so both terms were also applied to missions and flying forces providing either technical support on the battlefield or independent strategic bombing operations.

The concept of *operativer Luftkrieg* was thus unclear. The Bomber Chief of the Operations Department of the *Luftwaffe* General Staff, Major (later General) Deichmann, told me that when, in 1936, he called together all General Staff Officers and made them write down their definition of the concept of *operativer Luftkrieg*, he got as many definitions and interpretations as there were officers present.

Unclear thinking led to the attempt to conduct a strategic air war by tactical means as, for instance, in the Battle of Britain. The term 'strategic air war' did not exist in official *Luftwaffe* terminology. It was developed only late in the war after the Allied strategic bombing offensive had demonstrated the nature and effects of strategic air war and when it had become clear to the German Air Staff that it was more economical to destroy enemy tanks and weapons where they were produced than on the battlefields.

The factors contributing to the development of an essentially co-operative air doctrine were the following:-

- The experience of WW I, when support on the battlefield (starting in 1917) brought favourable results more quickly than the Zeppelin and giant bomber (Gotha) raids on Britain.
- The fact that the *Luftwaffe* by itself could not occupy the *glacis*, or forefield, thought necessary for Germany's protection in case of war, but had to do it together with the army. Only the army could occupy territory.
- The fact that most of the higher air force officers were former army officers.

- Shortage of the raw materials necessary to conduct a time-consuming strategic air offensive.
- The intention not to destroy the industries in the countries to be occupied on the Continent, but rather to use them for one's own purposes later on.
- The fact that the principles of independent strategic bombing were not yet solidly confirmed, the Spanish experience rather having proved the effectiveness of direct and indirect support of the ground forces.

Although the main incentive for Hitler and Goering to create the *Luftwaffe* as a third service was the idea of an independent strategic bomber force (as an attribute of a big power and as the *raison d'être* of an air force independent of, and equal with, the other Services and as a means to avoid the repetition of the bloody trench warfare of WW I), independent strategic bombing was to be only the last of the *Luftwaffe*'s three main tasks. The primary and continuous mission was the destruction (or at least paralysis) of the enemy air force through attacks on its ground organisation and production workshops. Later in the war it was learned that this had also to be done by continuous air battles. The second task was support of the operations of the ground forces, support of the navy enjoying equal rank in theory, but becoming the stepchild in practice because of lack of aircraft. The bombing of the centres of enemy war potential (strategic bombing) came last and was to be resorted to only when there was a standstill in land warfare and when a decision of the war could not be brought about otherwise, because this kind of air war consumed, so it was believed, too much material and time before its effects (if there were any at all) made themselves felt at the land front. The land front was considered to be Germany's main 'theatre of war'. Frederick the Great was aware that he could not sustain a long war and so were Germany's military leaders in subsequent centuries. After all, another means of overcoming positional warfare had been developed, the strategic use of tanks supported by the air force, a method that really functioned for the first time in the western campaign.

The necessity to economise led to the early development of navigational and bombing aids (*Knickebein, X-* and *Y-Geräte*), the adoption of the dive-bomber and the extension of the dive-bombing

requirement, even to the He 177 heavy bomber. You will all know its story and that, in order to reduce air resistance during the dive, two of its four engines worked on one crankshaft. This caused so many technical difficulties that the bomber never became operational. It was finally built with four separate engines and designed for horizontal bombing, but though about 1,200 He 177s were produced they could not be flown for lack of fuel. The dive-bombing requirement reduced the range of the bombers because of the extras needed and thus forced the designers towards the short- and medium-range tactical bombers.

Lack of raw materials was one reason why the air staff in 1939 refused to develop area-covering munitions, and it was only in 1942, after the incendiary attacks on Lübeck and Rostock that their development was ordered. The necessity to economise, and the recognition of the international laws governing the air war (which were like Swiss cheese and very inconclusive at that time) were, together with the classical continental European distinction between combatants and non-combatants, the main reasons why the *Luftwaffe* doctrine expressly forbade indiscriminate bombing to be part of the strategic air war concept, except as a reprisal measure. I must say, however, that the instrument of reprisal was resorted to so often that it soon lost its meaning: the more so since it was British policy to carry through strategic air attacks not as reprisals but as a method of warfare and for a long time the only way they could reach into Germany.

It was accepted that no bomber force in the world was able to drop its bombs exactly on target, either at the beginning of the war or later, and that collateral damage was thus unavoidable. I can say, however, that it was the *Luftwaffe*'s intention to adhere to the principle that its foremost objective was the enemy armed forces and targets of military relevance, until the spring of 1942. Admittedly (as in other bomber forces) the necessities of war usually prevailed over non-intentional collateral damage; civilian casualties were accepted if they could not be avoided in the execution of operations. But even Hitler, who must be blamed for many inhumane actions, warned his Chief of the Air Staff not to wage an indiscriminate bombing war, only ten days after his public announcement of 4 September 1940 that he would 'erase' British cities, and he repeated this order in his directive of 6 February 1941. Indiscriminate bombing would lead to nothing, he said. Of course, Hitler did not warn for humanitarian reasons. It was the

economic point of view he considered, and his fear of British retaliation.

When the *Luftwaffe* started to engage in some intentionally indiscriminate bombing attacks on British country towns in 1942, the so-called '*Baedeker* raids', it did so without sufficient bombers because these were tied down in Russia and the Mediterranean. The V1 flying bomb, the development of which was accelerated in 1942, was designed as an area-covering terror weapon and the V1 offensive was designed to be an indiscriminate air war.

Let me repeat, after all this evidence, that the *Luftwaffe* was mainly designed to be a co-operative air force in the widest sense, not a strategic instrument or a terror instrument. Although this latter function was propounded by the Germans themselves before the war, to threaten potential enemy nations into submission, and deliberations about the possible use of the *Luftwaffe* as an instrument of terror were not abhorrent to the *Luftwaffe*'s leaders, either before or during the war – such ideas were pondered over by most aviation writers and air strategists at one time or another, all over the world.

I shall now try to demonstrate some of the consequences of the five basic features of the *Luftwaffe*, insofar as I have not yet done so. The most striking example of the narrowing of *Luftwaffe* staff and command thinking to military matters and, within this limitation, the dominance of operational matters over the support and infrastructure sectors, was the organisation of the German Air Force High Command. The *Luftwaffe* was a new service without much command experience and it therefore changed its top echelon organisation more often than any of the other Services. There was the difficulty of combining the tactical with the technological side; there were personal feuds between the top officers which were fostered by Goering's policy of '*divide et impera'* and by favouritism.

Governing this top organisation until 1939 was the desire to streamline it in accordance with the immediate requirements of the expected short war, at the beginning of which all forces, including the reserves, had to be used for the decisive blow. Chief of Staff Jeschonnek reduced the General Staff to something like Goering's personal operational staff, confining it voluntarily to operational and tactical matters and excluding, as an unnecessary burden, everything not needed for the immediate purposes of operations, such as training,

technology and the inspectorates. The Chief of the General Staff also assumed the position and duties of the Chief of the *Luftwaffe* Operations Staff in order to shorten the chain of command and thus make it more effective. The Quartermaster services had been downgraded organisationally.

This was certainly an effective organisation for a short campaign but turned out to be insufficient for a long war of attrition. The reorganisation that took account of this came too late, in 1944 and 1945. The *Luftwaffe* General Staff had become an operations staff – just for the execution of orders. Nowhere was there a permanent planning staff, neither in the organisation of the Ministry, nor with the air fleets. Nowhere was there a permanent advisory or co-ordinating counsel or agency, for long-range planning, and (although the necessity of conducting the air war economically was always stressed) nowhere was there anything like an Operations Research Section. Planning was only one of the many tasks of the operations officers on the higher staffs. They did it besides their daily routine and operational work and at the most for just a battle or for a short campaign. There was no overall plan for the war in Germany, there were no technical planning and advisory committees for the conduct of the strategic air war against Britain; this was considered to be a military domain. It was not until 1943 that the Chief of the General Staff grew aware of the fact that this type of air war also required the knowledge and advice of the civilian technical and economics experts of the Armaments Ministry.

The predominance of the military aspects, and of operational matters, was further reflected by the low esteem enjoyed by the Quartermaster Service, employment in which could prejudice an officer's career. When the Operations Officer of Air Fleet 4 was given the function of Quartermaster of his air fleet by the Commander-in-Chief, Field Marshal von Richtofen (who also told him that this was only an intermediate step to becoming the air fleet's Chief of Staff), the officer protested, even though a Quartermaster was higher in rank than an Operations Officer in the Operations Section. Not the best officers were assigned Quartermaster duties. There is ample proof that many operations, indeed the entire war, was fought on the basis of operational and political objectives and not on the basis of logistics. The chief of the economy and armament department of the Supreme

Command of the Armed Forces admitted this in January 1942 in a speech before his assembled armament inspectors. This is not to say, that under certain circumstances, the quick and bold utilisation of a favourable opportunity does not also lead to success, but this applies more to the tactical and operational spheres. To base one's strategy on sudden opportunities does not seem to be a successful method.

Air transport as a means of supply was theoretically neglected until 1940, although the *Luftwaffe* carried out substantial air lift operations between Morocco and Spain in 1936 at the beginning of the Spanish Civil War. The Chiefs of blind flying training schools and of air transport operations were one and the same person in the first years of the war, since the same type of aircraft (the Ju 52) was used for both purposes. Once aircraft support operations became necessary the Ju 52s, with their instructor crews, were gathered together from the training schools and assembled into ad hoc transport units. Had there been an Air Transport Command early enough the problems of air supply for Cholm, Demjansk and Stalingrad in Russia, and for Tunis, would not have been given to Hitler so readily by Goering and the *Luftwaffe* General Staff. This command was, however, only established late in 1943 after the great losses in the air supply operations of the winter 1942/43, losses that could never be replaced and which substantially impeded the training of bomber crews.

This brings us to training, which, as Field Marshal Kesselring and the Quartermaster General of the *Luftwaffe* confirmed after the war, was the stepchild of the *Luftwaffe*. If cuts had to be made in the supply of gasoline or of new combat planes, the training sector had to suffer first. At the end of the war, a German fighter pilot received only one-third of the flight training time of an American pilot and more than 50% of the flying accidents were due to inadequate training. The number of aircraft lost without enemy action was generally higher than that caused by enemy action and ranged around 1,800 aircraft per month in early 1944 as against about 1,500 per month caused by enemy action. The comparatively low esteem of the military for technology resulted in important technical positions being filled by incompetent people, the best-known case being that of Udet, who was not the manager needed to direct air armament and the German aviation industry. Goering appointed him because he knew that Hitler regarded him as the most able and popular flyer in Germany.

In the *Luftwaffe* General Staff there was no civilian engineer or scientifically trained officer in a position of responsibility and, as mentioned above, there was organisationally a gap in the *Luftwaffe* High Command between operations and technology. Goering preferred highly decorated combat officers in positions of technical responsibility; their combat experience counted more than the expert opinions of engineers. Successful young engineers were, therefore, allowed to demand alterations to aircraft already in series production which resulted in delays in mass production. Jeschonnek, the Chief of the General Staff of the *Luftwaffe* said in March 1942 that the front-line officer should not have to accept everything that the aircraft industry wanted to get rid of.

The Corps of Engineers of the *Luftwaffe* was created in 1935 to set the active officers free for their operational tasks, with the result that these officers, who were always the superiors of the engineers, were not forced to familiarise themselves with technology, which for many of them meant dirty fingers. In fact, when this uniformed civilian Corps of Engineers was replaced by an Engineer Officer Corps in the later years of the war, the *Luftwaffe* High Command could not make up its mind as to whether or not those engineer officers were to bear visible insignia marking them as engineer officers, because it was feared that an officer recognisable as an engineer officer would not enjoy the authority and reputation of an ordinary line officer. The question was never solved during the war.

The prevalence of the operational point of view led responsible officers to underestimate the importance of completing each individual stage of aircraft development and to squeeze them together in time so that series production began before testing had finished. This happened elsewhere too, in times of need, but in the *Luftwaffe* it was the rule and resulted in the jamming and delay of series production. The best examples are the multipurpose Me 210 and He 177. Goering, especially, had no idea of the duration of the different development phases of aircraft. He was always astonished and furious when he was confronted with the fact that this policy did not lead to results as fast as he had thought. Lack of understanding of the laws governing technical development and production, coupled with the prevailing military principle of order and obedience, resulted in the belief that the aircraft industry could be commanded like an

infantry company. Moreover, the technical uncertainty of the responsible officers as to the type of aircraft suited best for each purpose brought about too many experiments in aircraft designs. In 1943, Germany produced more than 50 types, with about 250 variations and modifications, against only 18 standard models of the Americans. There were, in addition, more than 130 experimental types.

The preoccupation of the General Staff with operational matters further stifled the issue of tactical and technical requirements for the direction of the aircraft industry and allowed this lavish experimentation, when mass-production of the most important types should have been the order of the day. On the other hand, Goering and Field Marshal Milch, as well as Udet, seemed not to have sufficiently understood the importance of continuity of research and development. Goering and Milch especially, were more interested in production. Before the war, the research funds decreased continually in relation to the production funds and the aviation research department was steadily downgraded organisationally until its chief resigned early in 1942. In early 1940, all research and development projects were ordered to be stopped unless they yielded results within one year, after which, it was thought, the war would be over. This, and not Hitler's later meddling with aircraft production, was the main reason why the first jet fighter, the Me 262, was not mass produced earlier. There was also Milch's reluctance to risk putting a revolutionary new aircraft, with all its teething problems, into production.

Obviously, the leader of the *Luftwaffe* assumed that the conduct of an air war required a good tactical general staff officer in the first place, and could eventually do without technical general staff officers. So, under the pressure of Hitler's war policy, the Technical General Staff College was disbanded two years after its establishment, and technical courses at the College were completely dropped in late 1938, to be resumed only late in the war without success. There was also much reluctance among general staff officer candidates to become technical general staff officers because of the latter's low reputation. In this they shared the fate of the engineers in the *Luftwaffe*. The disdain with which the latter were regarded by many officers was enhanced by the fact that officers usually had a broader education, better manners, were able to lead men and had an *esprit de corps*.

Above all, they had the authority of command which the engineers did not have. Many a young engineer left the Engineer Corps to become an active officer at a lower rank, but with a chance of a better career. The relatively low esteem enjoyed by technologists and scientists is best demonstrated by the fact that such people, if they had not had previous military training, were drafted as ordinary soldiers and put into the trenches with a rifle, instead of being kept in their civilian capacities and put into laboratories. This attitude changed only later in the war, when it was too late.

Intelligence was another field which did not enjoy a reputation comparable to that of operations. The best staff officers were not assigned to such duties and, after the first setbacks, Goering and Hitler no longer wanted to believe in intelligence. The *Luftwaffe* intelligence service was disorganised as much as the entire German intelligence community, the co-ordination of the different Services being attempted only in 1944. German air intelligence substantially underestimated the three main opponents, England, the Soviet Union and the United States, in the decisive pre- and early war years, especially since ideological bias and euphoria arising from initial successes impeded its work. Whether Hitler, had he received correct data on the enemy, would have thought twice about going to war is, however, questionable. The results of intelligence work were usually realistic in relation to the enemy deployment, front-line strength, training, organisation and equipment, ie as regards tactics and operations. The signals intelligence service produced particularly good results. The cypher service, however, seems to have produced very little, and only information of a tactical kind.

Where intelligence failed was in its strategic perceptions concerning the enemy's economy, production capacity, morale and so on. To explain this failure one must remember that the *Luftwaffe* general staff officers who were in charge of the major positions within air intelligence, were trained more in the military field and not so much in areas important in grand strategy, such as economics, politics, science and technology. The belief in a short war, which had to be decided right at the start, by the use of all available forces led to the assumption that the potential that might be developed by the enemy later on in the war could be neglected. It was rather short sighted, but that's how it was. It is no wonder that, in a society that valued fighting

and leadership qualities in the field more than good performance in the supporting sectors and at the desk of the intelligence officer in the rear, there was a traditional disdain for intelligence work, which was considered to be close to spying. It should also be kept in mind that a military organisation that cherished the principle of the offensive is naturally more inclined to impress its will on the enemy by force, rather than attempt to understand him. In fact, only after Germany had been thrown onto the defensive did the *Luftwaffe* reorganise and intensify its intelligence activities, because now it needed to know more about the intentions of the enemy, in order to take appropriate measures for defence. Organisationally the intelligence officer on a staff was always subordinate to the operations officer.

As regards the principle of the offensive, let me just say that it prevented the timely preparation of a strong German air defence. You all know the words 'fortress without a roof'. As to the consequences of the overemphasis on co-operative air war, it suffices to say that the German bomber force had its greatest losses in this type of warfare – co-operative close escort – especially in Russia – something that was considered to be the most difficult kind of air war before the Spanish Civil War. Low-level attacks by medium bombers were frequent and costly and in 1943 the German bomber force had to be renewed twice, ie the losses were three times its initial strength at the beginning of the year.

Many of the fatal consequences of the main ideas around which the *Luftwaffe* was built up can be explained by the pressures of the situation: ie by the pressure exercised by Hitler to expand the armed forces (especially the *Luftwaffe*, which had to be established practically from scratch) and by the resulting armament in breadth rather than in depth, which cared for front-line strength more than for spare parts and reserves, and was to make the armed forces ready for the assumed short war as soon as possible. This explains the *Luftwaffe*'s attitude towards technological research, training, strategic intelligence and reserves. Indeed, Field Marshal Milch told the Director-General for Air Armament, Udet, before the war that Hitler would conduct only short wars, so that all aircraft repairs could be done during the breaks between the campaigns. The fiasco came when the war turned into a European, and later into a World, War of attrition which Hitler had hoped to avoid by settling affairs in Europe before

the big powers of East and West became too strong. Such an explanation, however, can only partially be accepted and would otherwise be rather superficial, because it neglects the fact that the traditional German militarist's thinking led to quite a few of Hitler's demands. This does not mean that all the military leaders also accepted Hitler's political and ideological goals, but the limitation of higher military leadership thinking to military matters, which was to Hitler's liking, had started already under the elder Moltke and had been intensified by Count Schlieffen, until General Ludendorff developed the idea of total war, in which politics was the servant of war. So attempts to widen the horizon of general staff officers, failed both in the 1860s and in the 1920s and early 1930s. Logistics, another of the non-operational fields, had been the weak point of the so-called Schlieffen Plan before WW I. Rommel was another good example of a tactician for whom logistics became important only when it did not function. The priority of the offensive was always a fundamental element in German military thought, mainly for the geo-strategic reason already mentioned.

The treatment of technology and technicians in the *Luftwaffe* also had deeper causes, originating from the social and political situation since the beginning of the industrialisation process, which started half a century later in Germany than in England. Most of the *Luftwaffe* leaders were born in the late 19th and early 20th centuries, well before the First World War. At this time the army would have preferred officer candidates from high schools which stressed the sciences and modern languages, the so-called *Realgymnasien*. For political reasons, however, it looked for candidates from the *Humanistische Gymnasien*, high schools that stressed the humanities, because they were the sons of families of the higher classes, of the bourgeoisie and aristocracy, which stood for throne and altar against the egalitarian and democratic ideas of the lower, more technical-minded classes of workers and craftsmen, who were even suspected of intending to overthrow the monarchy. The *Humanistische Gymnasien* produced graduates with a classical and all-round education, humanists who did not like the specialisation that went with technology. This does not mean that they did not like science. On the contrary, many of them became famous scientists. But scientific achievement to them was something that depended on the capabilities, on the genius, of the educated individual.

In short, graduates from the *Humanistische Gymnasien* were not particularly prepared for the technical professions. More than 75% of the later *Luftwaffe* generals came from upper middle class officer families or belonged to the nobility. Only 17% of the generals' fathers had technical professions. Two-thirds of the generals grew up in rural environments. Only 5% of the *Luftwaffe* generals and general staff officers obtained technical degrees. During the time of the Weimar Republic these officers could not familiarise themselves with higher technology because Germany was not allowed to have aircraft and heavy weapons. The belief was kept alive that the officer with a higher education was superior to the engineering specialist and could carry out the majority of duties. So, when the Technical General Staff College was closed, it was obviously believed that the 'tactical' general staff officer could handle operations as well as technology, whereas it had never been assumed that the technical general staff officer would be able to do both. To demonstrate the prevailing belief that the broadly-educated officer was competent in the technological sector and at the same time to elucidate the misconception of technology which existed, I should like to quote a sentence from an official report on *Luftwaffe* performance during the *Wehrmacht* manoeuvres in 1937: 'Officers', it said, 'who received commissions as commanders of airfield service companies for the duration of the manoeuvre were not able to fulfil their difficult task, even if they were public prosecutors.' This implied that a public prosecutor (ie a person who had studied law at a university and was considered to be an educated man) was expected to be able to run a highly technical outfit without any preparation.

National Socialist ideology thought of the rational approach to life in an industrialised society as 'Americanism', against which it glorified pre-industrial and irrational values like faithfulness, bravery and so on; without these, of course, no society and no armed force could exist, but they needed to be supplemented by rational values. The ideology thereby created an atmosphere which did not exactly favour a rational approach to life and to technology. There were many good technologists and scientists in Germany and Hitler used them for his purposes, but he, and National Socialism, did not want to submit to the laws and regularities inherent in technology. Technology was considered to be an art, the product of the creative individual genius;

that a lot of team work by ordinary men was necessary to achieve results here was simply not understood. So, when the Germans realised that they were far behind the Western Allies in radar technology, Goering staged an inventors' contest in the belief that a spark in the brain of a genius could bridge the gap. The suitably qualified scientists – who first had to be released from the armed forces – could, however, not solve the problem at short notice, as may be understood.

Let me now mention the so-called *Auftragstaktik* (mission type order) as a further cause of inadequate technical understanding among many air force officers. The army, where most of them had come from, had developed this principle in the previous century. It permitted a commander to execute an order in accordance with the actual situation and did not lay down *how* he had to execute it. In land operations, for which this principle was developed, it allowed quick changes in response to new situations. In air operations, however, the principle did not work so smoothly, because they were largely conditioned by predetermined technological factors, which could not be changed so readily and required much more planning and adherence to advance programming.

Once an air operation had started, there was little scope for further orders and many an older *Luftwaffe* officer, having been educated at the *Humanistische Gymnasien*, and originally trained in the army, was driven to despair. One of them wrote after the war that, whereas general staff work used to be an art, in the *Luftwaffe* it was a mechanical business with a slide-rule, which required 'just common sense', organisational abilities and some technical skill. Such duties he obviously considered to be beneath the general staff officer. Younger officers certainly thought otherwise, but they had no say.

The neo-humanistic belief in the well-educated individual who was able to understand and fulfil a multitude of tasks had produced in the early 19th century the principle that officers could be assigned to any kind of role. In a perverted form this ideal seems to have amalgamated with the otherwise social-Darwinistic leader-principle of the National Socialists. Goering, in particular, favoured it in the *Luftwaffe*. While the other service headquarters were called High Command of the Army or Navy he had his Air Ministry and Air Force High Command designated as 'The Reich Minister of Aviation and Commander-in-

Chief of the *Luftwaffe*' until shortly before the end of the war. The belief in the capabilities of the individual leader went so far that, whenever a problem had to be solved quickly, Goering appointed a dictator (eg when electronic valves became rare, a tube-dictator) or a plenipotentiary for the specific task and gave him almost unlimited authority to deal with it. At the end of the war there existed many of these plenipotentiaries, each encroaching on each other's business and creating turmoil. Together with the traditional military principle of obedience, which had been instilled into the generals while they were still schoolboys in a *Gymnasien* before WW I, and with the prevailing Nazi-authoritarianism, it was this individual approach to leadership that tied the *Luftwaffe* to the traditional authoritarian style of command requiring almost omniscient leaders at the top. In addition, the traditionally high reputation of the military, and of the officer, in militarised German society created a gap between civilians and the military and induced the latter to look at war as the exclusive business of the soldier. Since there was not much horizontal exchange of information and since the staff organisation stressed the vertical lines of authority ending in the respective commander or leader – for instance, the only connection between the various intelligence services was in Hitler's head – the leader was supposed to be able to decide virtually everything on his own with little advice from experts and was certainly overburdened. Another example of the belief in the all-round capabilities of the individual staff officer was the early attempt to educate general staff officers to be good operations officers at the same time as good engineers, an attempt which failed.

For all of these reasons, the *Luftwaffe* did not develop a co-operative style of command and leadership, as I have indicated already when mentioning the absence of mixed military and civilian advisory and controlling bodies. It did not try to compensate for the natural limitations of the knowledge and abilities of any one individual leader by establishing boards and committees. One would have expected that in an air force, a highly technical instrument capable of interfering with enemy economies and consuming the highest share of the nation's armament expenditure, a co-operative style of command would have been the first thing to develop, because there, more than in the army, many technical and economic factors had to be considered. No single person could master all of these issues without the

permanent advice of experts and committees, firmly established throughout the whole organisation. For the conduct of a strategic bombing campaign it was, for instance, necessary to have the advice of civilian experts on questions of the economy, the industrial grid system, science and so on – just as Bomber Command and the British Air Staff were assisted by various civilian ministries and agencies.

Officers by themselves cannot know everything necessary for such a war. If Goering and Hitler chose to ask outside individuals for advice, they did so only on an ad hoc basis. Advisory and controlling boards ought also to have been set up in the fields of operations and technical administration of the *Luftwaffe*. But since the officers had the say here, and there was a gap between the civilian and military side in German society, the climate for such an organisation did not exist. Moreover, Hitler's basic order No 1, of 11 January 1940, for the safeguarding of military secrecy, prevented the steady flow of technical, political, scientific, military and economic information that had to form the basis for higher decision-making in a modern war, because nobody was to know more than was necessary for his immediate task. Hitler – and similarly Goering and many little *Führers* in this social-Darwinistic system of command – relied on his own genius and refused to submit to a rigid routine of regular attendance at conferences of permanent boards. When the *Wehrmacht-Akademie*, in 1938, drew up a manual for the conduct of war at the highest level (*Kriegführung*) providing for such a top organisation, Hitler prevented this manual from becoming effective. He did not want to have anybody telling him whom he would have to consult and when. The overall conduct of the war he made his own domain. This was also one of the reasons why the general staff training of the *Luftwaffe* did not include courses in grand strategy and why the *Wehrmacht-Akademie*, which tried to train higher officers in this, ceased to exist in 1938. The Supreme Command of the Armed Forces, and especially the Armed Forces Operations Staff, was kept small and could thus not undertake the effective direction of the war as a whole and the operations of all the Services. Under all these circumstances it is no wonder that nothing like the British and Allied committee system ever developed. Hitler's conferences were usually monologues; Field Marshal Milch's air armament conferences were parliamentary debates with very few definite or recognisable

conclusions and hardly any decisions to be carried out. Too many people participated.

In conclusion I should like to point out that many of the problems of the *Luftwaffe* were also encountered by other air forces, and indeed still occur in new disguises. The *Luftwaffe* was too young – just 4 to 6 years of age, when the war started – to have enabled its leaders to gain sufficient experience in the handling of such a highly technical service, and during the war it had no time to cope with the multitude of problems which were mainly caused by Hitler's irresponsible policy and strategy, on which the *Luftwaffe* had next to no influence. Goering's political influence on Hitler had been on the decline since 1938. The *Luftwaffe* had no time to get away from the old army style of command and its leaders were still too much involved in thoughts and attitudes that corresponded more to those of a pre-industrial and authoritarian society and had not yet developed to match the degree of industrialisation which Germany had now reached and which had enabled her to build a strong air force. The mental approach to the air war was inadequate. While the outward appearance and form of contemporary RAF and British staff documents already demonstrated a great amount of rationality, comparable German documents did not. This indicates an irrational, or romantic, approach to the overall direction of the war on the German side (though not to tactics and operations) in contrast to the systematic grand strategy employed on the British and Allied side. On the strategic and grand strategic level, *Luftwaffe* leadership was poor. But within its own limitations and the ones imposed on it from the outside – here I mean Hitler, the National Socialist regime, the war itself, and allied superiority in men, material and advanced thinking – the *Luftwaffe*, I believe, performed very well. That it lasted so well through this long war was mainly due to its good tactical and operational leadership, its initial technical superiority and the fighting virtues of its soldiers. The fact must, however, be faced that it was the fate of the *Luftwaffe* to have to serve Hitler's political, and inhumane ideological aims in the most terrible war ever experienced.

What I wish to make clear above all is that if the air war, as Richard Overy says, was a test of the modernity of industrialised nations, then its outcome was the proof of that modernity.

SEMINAR ON 31 OCTOBER 1988

THE ROYAL AIR FORCE AND CLANDESTINE OPERATIONS IN NORTH-WEST EUROPE

Introduction by Air Marshal Sir Frederick Sowrey

This evening we have amongst our guests those who have participated in special operations in north-west Europe. It would be invidious of me to pull out the names of those great protagonists and gallant operators who took part, but perhaps I could just mention those who are *not* members of the Society, in no particular order except the way they are sitting in the front row – Brigadier Michael Calvert, starter of the SAS, great leader, SOE operator in north-west Germany; Robin Hooper, again involved, himself, to a very great degree; Sir Douglas Dodds-Parker, delighted to see him with us this evening, and Sir Brooks Richards who is also President of the Special Services Club. A very warm welcome to you, gentlemen, from the Royal Air Force Historical Society.

But to the team which we have on the platform, in the order in which they are going to speak – Professor Michael Foot, Group Captain R Hockey, Air Chief Marshal Sir Lewis Hodges, Group Captain Hugh Verity and Mr Tony Brooks, who was our man on the ground, despite in fact being put in from the air.

Professor Michael Foot will take the chair and there will be a short break before the discussion period, during which the panel will take questions, discussion and contributions, which we hope this magnificent audience will make towards an august and historic evening. It's all yours, Sir.

Professor Michael Foot

In Air Chief Marshal Sir Christopher Foxley-Norris's *Royal Air Force at War*, which the Benevolent Fund published in 1983, two chapters dealt with tonight's subject, and the author of each is here. One of them, Bob Hodges, will talk about the business of parachute dropping in which he engaged and the other, Hugh Verity, will say something about what it was like manoeuvring a light aircraft; he went twenty-nine times to France in 1943, landed, and came back. Before either of them speak, Ron Hockey will explain how the thing started

up from scratch, and at the end, Tony Brooks, who was really at the sharp end, spending two years in France pretending to be French, will explain what that was like.

This was an odd corner of the war; among the oddest. It was not the first field into which somebody would put himself who was anxious for personal publicity or personal renown. It had to be kept well out of the public eye, though oddly enough the main airfield at Tempsford from which the special duties squadrons operated was alongside the main line from Kings Cross to Edinburgh, and abutted on the Great North Road, so it was not all that private. Every wartime operation had to be secret until it took place (that was taken for granted) but the special duties squadrons did not enjoy the publicity that so often attached successively to fighter and to bomber squadrons because what they were doing had to remain secret as they were doing it for the Secret Services. In the earliest days it didn't seem that any of their work would ever be admitted and some of it may remain inadmissible even at the present day. It was an extra lonely kind of flying because outside one's own flight hardly a soul in the country was aware of what one was doing. It also called for dedicated airmanship and, even for the Royal Air Force, an unusual degree of readiness to press on. For a few dizzy weeks in the summer of 1940 the Chiefs of Staff, believing they had no other offensive resources at all, looked to sabotage and subversion from inside the Nazi new order as their only available weapon. By the time the Special Operations Executive (SOE), the dirty tricks department, had been set up, hardly before time, in mid-July 1940, the Chiefs of Staff were already beginning to look for salvation elsewhere. SOE could, it turned out, do two main kinds of thing. It could organise sabotage, or it could help to organise secret armies. Each task required stores and agents to explain how to use them, who had to be put in, because there was no other way of getting them in that was practical in any quantity, by air.

It would be going too far to say that without the RAF's support the resistance movements of north-west Europe could have done nothing, but they would certainly, without that support, have done a great deal less than they did. The first British clandestine air operation in this war, of which I have heard, is supposed to have involved the parachuting of a single man, near Paris, as early as 20th June 1940, two days before the French signed the Armistice, too secret to go into

anybody's operational record book, but years later the man, who had become vain, talked. Phillip Schneidau, recruited into the Secret Services by J C Masterman on the international hockey field, parachuted into France in September 1940 and was brought out next month by Lysander. Both these operations were for SIS and they will remain unacknowledged. The first attempt for SOE was made on the night of the *Luftwaffe*'s big raid on Coventry, 14/15 November 1940. A Whitley got to the neighbourhood of Morlaix in north Brittany, the solitary agent took a long look through the hole in the floor and decided he wasn't going to jump. Before much more could happen, there was a stiff hedge to cross – Portal's opposition.

Gladwyn Jebb, now Lord Gladwyn, then SOE's Chief Executive Officer, sounded Portal out early in 1941 about an Air Ministry proposal to drop some Frenchmen into south Brittany to disrupt the *Luftwaffe*'s Pathfinder Force by ambushing a busload of pilots. Portal replied on the same day, 'I think the dropping of men dressed in civilian clothes for the purpose of attempting to kill members of the opposing forces is not an operation with which the Royal Air Force should be associated. I think you will agree that there is a vast difference in ethics between the time-honoured operation of dropping a spy from the air and this entirely new scheme for dropping what one can only call assassins.' Jebb managed to talk Portal round. The RAF's first successful operation for SOE, a flight of more than a dozen hours in an unheated Whitley to Poland and back, dropping three men at the limit of' the aircraft's range, took place on 15/16 February 1941. That French party dropped into Brittany after all in March, only to find their target already dispersed. The first party from the rival independent – that is, non-Gaullist – French section dropped into the centre of France in May. Thereafter, gradually, these flights, though always exciting for the agents taking part, became for the air crews something of a routine.

Though Portal had been talked round, Harris, then his deputy, soon thereafter Commander-in-Chief of Bomber Command, remained hostile to SOE throughout the war. He had a sound, professional reason for this. Aircraft allotted solely to secret work were, from Bomber Command's point of view, part-wasted assets because they could only work for 10 or 12 days out of every 28. They had to have moonlight to see where they were going, just as the agents and

reception committees to whom they worked had to have moonlight to see what they were doing. As Sir Robin Brook put it in retrospect, in SOE, 'for at least two years the moon was as much of a goddess as she ever was in a near-eastern religion.' This apparently lunatic line concealed some hardbitten airmanship. At a time when many aircraft in Bomber Command did well to know what country, let alone what county, they were flying over, aircraft on special duties had already begun, not only to find particular counties, but to find particular fields in them. This they could only do by meticulous map-reading both before and during the flight; much easier of course for the navigator of a multi-engined aircraft than for a Lysander pilot who had to do everything himself. Once SOE settled down to its sums, the requests it made for aircraft became, from Bomber Command's point of view, alarmingly large.

I might instance the 'Carte' organisation with which the SOE sections working into France were toying in the spring of 1942; that was going to require nearly 4,000 tons of stores to get armed. As it turned out, 'Carte' was purely notional; it was a complete illusion; it had no real existence at all, apart from one man with one bright idea, but the idea that it might be necessary to shift this quantity of stores, was one that SOE staff thus learnt to handle comparatively early. Portal remained sceptical. He used to describe Bomber Command as a gilt-edged investment certain to bring in a return, a steady return, while SOE was a gamble which might bring in a fortune or might bring in nothing at all. There were never anything like enough aircraft from SOE's point of view. Care was taken to slot their allocation and their use as carefully as possible into the general course of allied strategy and by the spring of 1944, though not till the spring of 1944, the United States Army Air Force had begun to lend its powerful support.

To satisfy the RAF's sense of the proprieties, SOE never actually gave orders to operational units. A new sub-branch of the Air Intelligence Directorate, called AI2c, was set up to deal with SOE's operations staff. This staff requested AI2c to mount operations arranging them, if need be, in an order of priority; AI2c then directed Tempsford to carry them out. Harris is said, perhaps unfairly, to have picked on Tempsford for the special duty squadrons' base because it was the foggiest airfield in his command. Almost all the work that

Tempsford did, about nine-tenths of it, was for SOE rather than for the intelligence, or the escape, services. But there is one escape operation that does command mention. A girl called Trix Terwindt, a former KLM air hostess, was dropped very late on 13 February 1943, to an SOE reception in Holland and was handcuffed at the side of her dropping zone, for SOE's work in Holland at the time was entirely in the hands of the *Gestapo*. Her training as an air hostess stood her in excellent stead: she was trained to be used to sudden shocks. She, at least, of those fifty-odd unfortunate prisoners said nothing she should not have said, kept her head, kept quiet and survived. In the Netherlands, only, the loss rate on special duty operations went up to 18%, one aircraft in every six dispatched, so in June 1943 the Air Ministry imposed a temporary ban on special duty flights there.

At the same time in France, the Germans were often aware of Lysander and Hudson flights through the notorious Dericourt who was working for as many sides as would pay him. The Germans in France took care never to interfere, not wishing to kill the goose that laid a number of golden eggs for them. When, in November 1943, operational responsibility for special duties flights into north-west Europe was transferred from AI2c to Bomber Command, Harris moved at once. He did his best, in conjunction with several of SOE's many enemies in Whitehall, to get SOE wound up altogether and not until January 1944 when Lord Selbourne, the Minister in charge of SOE, managed to play the ace of trumps in the shape of Churchill's personal support, were both SOE and Special Duties Operations put firmly back on to the road. They are only just coming forward into respectable public gaze. Historians of international relations and historians of war usually omit what Andrew and Dilks have called 'the missing dimension', the problems of intelligence, security and subversion that can dominate so much of government policy. Inevitably the question comes up – did these operations do any good? Or were they, as Harris always maintained, scandalous diversions from the proper task of the main force?

Some of SOE's main triumphs, and they did exist, were not in north-west Europe. That extraordinary series, for example of smuggling and black market deals in Chiang Kai Shek's China that netted £77M, about £950M at today's prices, and enabled SOE to wind up with its accounts in the black. But some were, Eisenhower

reckoned, for instance, that resistance had been worth up to half a dozen divisions to him in the course of Operation OVERLORD, for which SOE had caused the RAF to deliver arms for about half a million men into France. As I have said elsewhere, arms were as indispensable to a successful resistance movement as rain is to a farmer; no arms – no armed struggle.

Before Eisenhower's armies landed in France, one of SOE's best agents there, Harry Ree, had invented a technique of blackmail-sabotage. The agent calls on a factory manager, carefully chosen of course, and explains that if the manager does not allow a little discreet sabotage, the whole plant may be laid flat by an air raid – a tremendous saver of casualties had it only been worked out sooner and much more widely applied. Of actual sabotage there was a good deal, especially in France and Denmark. I was able in my book on SOE in France to include a list, originally worked out by Tony Brooks, of ninety-three enterprises put out of' action for various lengths of time with a total weight of plastic considerably smaller than the bomb load of a single Mosquito. On the secret army front also, quite a lot got done. How much might be summarised in a table, not yet published on this side of the Channel, of the quantities of warlike stores parachuted on SOE's indent into various parts of Europe:

Yugoslavia	16,469 tons
France	11,333 tons
Italy	5,907 tons
Greece	4,205 tons
Albania	1,205 tons
Denmark	700 tons
Poland	600 tons
Rest of Europe	2,327 tons

Yugoslavia, you see, got much the most, the odd 469 tons were probably food, but all the rest were arms or explosives. France got 11,000 tons, Italy nearly 6,000, Greece 4,000, Albania just over 1,000; Denmark, which came rather late to the business of resistance, 700 tons; Poland only 600 tons, because it was so far away and aircraft going there were not allowed to land in Russia – they had to come back. The rest of Europe, Holland, Belgium, Norway and a few oddments such as Czechoslovakia thrown in.

In these operations the RAF forged a strong, though usually unnoticed, link between this country and the particular districts where they reached their climax of a parachute drop or a clandestine landing. That, during a world war, a local stretch of meadow or moorland could be picked out for individual attention sometimes seemed not much less than a miracle to members of reception committees. It did not suit the diplomats, either side of the Channel or the North Sea, to remember this later – it was too far outside the normal run of diplomacy. There are still many witnesses alive to testify to this fact and the well of affection for England arising from it has not quite dried up. It was also of supreme importance to all the occupied countries that their citizens should regain, if they could, the sense of national self-respect that they had lost at the time of occupation and defeat which through resistance, as it was armed and fostered by SOE, they could. And much can be forgiven the organisation that stymied Hitler's attempts to build an atomic bomb.

I am now going to hand you over to the man who dropped, himself, the two men trained by SOE who helped to get rid of hydrogen – Group Captain Hockey.

Group Captain Ron Hockey

I have been asked to talk about the early days of the build-up of this unit and the days when we were trying to sort out what we had to do – tactics, procedures and all that sort of thing. The initial RAF unit which was known as 419 Flight, was formed at North Weald, north of London, on 20 August 1940. Its original purpose was the aerial transport of SIS personnel and one of its early operations, of which you have heard, was the deposit and collection of the late Phillip Schneidau from France in 1940. Phillip's story of the eventual landing near Oban and the difficulty of identifying himself and the pilot of the Lysander, Wally Farley, to the local Home Guard and police was a classic yarn and always of interest to his restricted circle, invariably told with his usual humorous anecdotes. Phillip was a great chap and we miss him very much.

I eventually joined 419 Flight from my previous unit at Stradishall in November 1940. The original aircraft establishment was two Whitley Vs and one Lysander. We had five pilots and all captains were very experienced for that era. Most had done much flying pre-

war: 1,500 hours was laid down as the minimum requirement. At that time we carried co-pilots for navigation and map-reading purposes except in the Lysander. In those days, there was no separate navigator trade in the RAF and all pilots were trained in navigation up to a basic standard. Later, air observers, so called, were trained in navigation and bomb-aiming and eventually these specialities also became separated. Co-pilots continued to be used for the very long sorties, to help with the pedalling and also for training purposes, of course.

My initial briefing was to carry out a number of the longer Whitley sorties followed by a few shorter Lysander operations, depending upon operational requirements. This original policy was overtaken by events. Because of the formation of SOE, its expansion and its demand for our specialised services through an ever-widening area of Europe, the original policy never caught up with events until after 161 Squadron was formed.

The original unit was later renumbered 1419 Flight because of the advent of Canadian units, all of whom took the 400 sequence. We were flying from Newmarket racecourse and were raised to Squadron strength in late 1941. After a short return to Stradishall it moved to its final destination at Tempsford in March and April 1942.

I had the job of moving the squadron from Stradishall and I think Professor Foot said it was picked because it was the foggiest aerodrome in Bomber Command. I think it was the *boggiest* aerodrome in Bomber Command, because when we moved in only the runways were just showing through the water and when I inspected the aircrew accommodation, most of it was a foot under water as well – Nissen huts and so forth. So the first job I had to do even before we unbogged one of the aircraft was to billet all the aircrew out – eighty of them anyway – in the local village that same night. I must say that the police really reacted pretty swiftly and we got them all out that same evening.

Well now, by this time the expanded unit, now 138 Squadron, was operating over a wide area including Norway, Poland, I don't have to tell you where it is, Denmark, Czechoslovakia, as well as France, Belgium and Holland. Sorties were also flown into Yugoslavia on one or two occasions, staging through Malta. This, we found. was not very cost-effective, as our very few aircraft were away from base so long, often jeopardising other priority sorties, and so 148 Squadron, which

was based in the Middle East, took over this area, operating initially from Derna in about 1942. A small number of Halifaxes, Mark I and Mark II aircraft, were made available in late 1941 for the longer sorties, although Whitleys had been used for the initial flights to Poland and Czechoslovakia. The latter, in October 1941, succeeded in inserting radio signals facilities, allowing the first direct contacts between the Czechs and London since the occupation. The first Halifax sortie from the unit in December 1941 was also to Czechoslovakia carrying the assassination squad which eventually eliminated Heydrich. The provision of larger aircraft allowed more load to be carried further. Packing facilities of SOE to provide the additional containers were sorely tried by the sudden increase of capacity. The aircrew naturally always wished to carry their maximum load, which could vary with range of sortie. When SOE packers caught up with the capacity available there were occasionally complaints from the field as the load was beyond the capacity of the transport available.

A few experienced ex-bomber crews from the Polish Air Force joined 138 Squadron in early 1942. These were trained on Halifaxes with the squadron and were mad keen to fly to their homeland. They were a great acquisition to the unit and performed excellently. In 1942 further expansion took place by the formation of a further squadron. 161 Squadron was formed from B Flight of 138 as a nucleus. Most of the Whitley and all of the Lysander aircraft moved to 161, leaving 138 to specialise in the longer sorties. Other aircraft were considered from time to time and in 1941 extensive trials were conducted during the period we were at Newmarket and Stradishall with a Martin Maryland to determine whether the season of the longer sorties could be extended with a faster aircraft, up to 300 mph, particularly to Poland, etc. Unfortunately the Maryland proved unsuitable due to fouling of the tailplane by parachutes causing unacceptable damage. Also the windscreen reflections at night were confusing and could not be improved without major fuselage modification. I don't think the Americans ever flew them at night actually. The Curtiss electrical constant speed propellers were also prone to run away without warning and rather liable to give a noisy greeting at an inopportune moment. So we had to scrub that one. It was an ex-French Maryland, actually, originally ordered by the French and so of course the first

thing we had to do was to change the throttle direction otherwise we'd be in problems there. All our French aircraft opened their throttles by pulling them back for some reason – I suppose that's because they drive on the right hand side of the road.

The Halifax, I think, was a sturdy aircraft with enough redundant structure to keep it flying if damaged in action – this is very important, I tell you, with military aircraft; it was also good for servicing repair, with the structure subdivided for component replacement. The Liberator for example is all in one piece, you can't take the wings off without taking the rivets out, so if you have to repair it you've got to put it back in the building jig. A Merlin-engined version of the Halifax was used because of its better fuel consumption and longer range. The later Bristol-engined ones were rather thirstier of course, so we kept the Merlin ones. The fuel carried for maximum range was 2,732 gallons, if anyone is interested; I can always remember it. With more recent machines an additional wing-tip tank gave 2,982 gallons, so that would keep your car going for a little while! The later Merlin 20 and 22 engines in the Halifax had a coolant mixture of 70/30 water/glycol which was a great improvement on the Merlin 10 or the Whitley which had 100% glycol and so if you had an engine fire and you got to the flash point of glycol – it of course added to the conflagration, which was quite dangerous for the Whitley. In May 1944, after my time in the unit, Stirling aircraft replaced Halifaxes when the Stirling proved inadequate for main-force bombing due to height limitations. By that time the longer sorties to Poland, etc, were being organised from Foggia in Italy.

Now just a few points about some of the problems. There were a few problems, particularly with the longer sorties in the early days but we tried to anticipate as many as possible. One of the major problems was weather reporting. For our targets in eastern Europe there was little information and generally you had to assess and find out. The Group Met Offices were generally concerned about Main Force operations. and naturally could not give priority to a few odd places on the weather map, particularly with no reports in the area. There was also the problem of security, and going to the Met Office and saying we want to know what the weather is 'there' was a breach of security right away, of course. Nearer sorties were easier and often results of Met Flight sorties were available which could confirm probably local

synoptic changes. The service certainly improved when we arrived at Tempsford with our own Met Office.

It was the long jobs which presented the problems, as conditions may be suitable over the target area and yet be bad en route. Remember, we were still in the era of icing problems so there were often abortive operations, and it was very frustrating for a crew to go time after time on the same operation and have to bring the whole load back, knowing that they or another crew would have to repeat the same trip again shortly. This required a special type of crew on these long operations, often 10 to 12 hours, who were really dedicated to the job, because there were no alternative targets in this sort of work.

To deduce the weather pattern whilst in flight, analysis of wind vectors could help. One requirement is to set the altimeter, at the correct datum of course, to monitor the height above ground in the target area. There were no radar altimeters in those times. The operating height for parachuting was generally about 500 ft. This datum setting could vary considerably from one's starting datum and 30 millibars lower would indicate about 1,000 ft over-reading. Rather like Russian roulette of course, always hoping you're on the right side. Having lost two trailing aerials in the trees in Czechoslovakia, I have some sympathy with it. The associated navigation on the long sorties was right back to basics. As electronic boxes were developed so they could be used when within range (for example Gee, also equipment like Rebecca/Eureka and S-phone which were developed later) but these could not be dropped in some countries because of compromising equipment, or where ground facilities for secure transport of such loads were not available in difficult terrain. There were some enemy DF stations (which needed decoding) but were generally too inaccurate at the range required. So if the target was out of range of sophisticated navaids one had to navigate, above clouds – successive star sights, more wind vectors, reset the altimeter, decrease height near the target, hoping to identify a ground feature and be able to map-read to the dropping zone. It was often difficult on a dark night, even with some moon to tell when you broke cloud if the ground was snow-covered, especially if the cloud was also snowing. Anyway we had a certain amount of success which relieved the monotony of course.

Undoubtedly the most difficult country in which we operated was

Czechoslovakia – a long flight, all over enemy territory, much high ground (the Tatras and associated ranges), flights only in the winter to benefit from the long nights, so terrain was often snowbound, and no reception facilities in Czechoslovakia.

Although Poland was also a long flight the terrain was fairly flat and by routing over the North Sea and Denmark intermediate checkpoints were obtainable. There were also reception committees. There was also a very large river throughout Poland, the Vistula. Unfortunately target areas in southern Poland were out of range until operations from Foggia started. After serving continuously on this unit in its formative years (419, 1419 Flight, 138 Squadron) from November 1940 until February 1943 I was posted to Mediterranean Air Command to build up a similar facility to operate from that theatre into Europe. After forming 334 Wing which subsequently moved to Foggia, I returned to the UK in early 1944 and found myself operating 38 Group squadrons in support of SOE's build-up for D-Day. This proved effective training for the units which were subsequently to land the Sixth Airborne Division in Normandy on 6 June 1944.

In conclusion, I should add, as one of the planning staff for OVERLORD, NEPTUNE, MALLARD, etc, that I was very pleased to include my old squadron, 138, in the spoof raids over the Pas de Calais. They carried out this operation, whose timing was critical, in the manner to be expected, which certainly helped to delay the enemy armour and movements towards the real battle.

Air Chief Marshal Sir Lewis Hodges

Group Captain Hockey has described the beginnings of the Special Duties Squadrons supporting the work of the clandestine services, SOE and SIS. He has explained the vast area over which we were required to operate from Norway, through Poland, Denmark, Holland, Belgium, France, Czechoslovakia, and of course at the same time parallel operations were going on in the Mediterranean covering the countries there, Greece, Yugoslavia, Albania and Italy.

To be able to do an efficient and effective job we needed the right aircraft, with the necessary payload and range, and it was the arrival of the Halifax that made this all possible. As Group Captain Hockey has explained, the Whitley in the early days was all we had for the job and we had to make the best use of it, but its performance did restrict very

much indeed what we were able to do. I personally only did one operational sortie in a Whitley, in fact my first operation on the squadron, 161 Squadron, when I joined it in November 1942, and that was to take two agents to France and to drop them in the Loire valley to a reception committee, and by that I mean agents on the ground who were trained specially to lay out the lights, a pattern of torches, and then they would flash a pre-arranged code signal so that the air crew could identify that the right people were on the ground.

These operations were all arranged by coded radio signals between the agents in the field and London, and then the final clearance on the night, to say that the operation was on for that night, would be given by a pre-arranged personal message over the BBC after the news bulletin.

If I could just digress and say a word on how I came to join 161 Squadron at Tempsford. I had been in Bomber Command since the beginning of the war with 49 Squadron, bombing targets in Germany up until the spring of 1942. Then I went to a Whitley operational conversion unit training crews for bomber squadrons. At that time Wing Commander Charles Pickard was the CO of 161 Squadron, having just taken over that squadron at Tempsford. I knew Pickard and we had both been serving on the same station in Bomber Command previously, and he asked me if I would be interested in joining this special squadron as he was looking for a Flight Commander and having already done a tour of operations in Bomber Command, I had a lot of experience of night flying, night experience, and having been at a Whitley OCU, I knew that aircraft well and so in November 1942 I was posted to 161 Squadron at Tempsford to command a Whitley flight. that is to say the parachuting job. Now I mention this just to illustrate the point that the crews that we had in the Special Duty Squadrons were normally selected on the old boy network. They were personally selected by the Squadron Commander so that we were sure that we had people with really good experience and that they would fit in to these special units for this special type of work. It was done very much on a personal basis.

When I joined the squadron, there were two flights, the Whitley flight, later replaced with Halifaxes, and the other was the Lysander flight augmented later by Hudsons. 138 Squadron was the other squadron at Tempsford, as Group Captain Hockey has mentioned, and

he was commanding it at that time and they had already been re-equipped with Halifaxes. As the Chairman mentioned in his introductory remarks, as special squadrons undertaking this highly-specialised role, we were not in the early days working under the operational control of Bomber Command at High Wycombe, as were of course the Main Force bomber squadrons, and we were regarded certainly with considerable suspicion, as is usually the case I think with special units and we were certainly not popular with the boss, Sir Arthur Harris. He looked upon us as a diversion of effort from the main task of bombing Germany, and hence the reluctance to give us priority for the newer type of aircraft which were of course in great demand for the bomber squadrons.

In fact this sort of tussle went on throughout the war, not only in Europe but also in the Far East where I went later on to command a Special Duties Squadron. We had exactly the same experience in south-east Asia.

And so I started operations on Whitleys and shortly after my arrival at Tempsford we were re-equipped with the Halifaxes and we set out to convert the crews to the new aircraft and to start navigation training and parachute training, dropping dummy loads to simulate operational conditions. Dropping was normally from 500-600 ft and we carried the normal Halifax crew, except that we had in addition a despatcher, whose job it was to look after the parachuting side of the business, and to see to the dropping of agents and stores carried internally in the fuselage. The lower turret of the Halifax had been removed and doors were fitted in the hole and it was through this aperture that agents, personnel and stores were dropped. Heavy containers for arms and ammunition were carried on bomb racks in the bomb bay. Thus from the beginning of 1943 with a full complement of Halifaxes we were poised to carry out our job for SOE and the other clandestine services, delivering people and stores to the various resistance groups in north-west Europe. We ranged over all the countries, but the largest effort in north-west Europe was directed to the resistance groups in France. 1943 saw the introduction of radar for navigation in the form of Gee, which transformed the whole picture for us and enabled us to get much greater accuracy in penetrating enemy territory, particularly in bad weather.

Each different area had its own problems. In Poland, Denmark and

Holland, for example, we had to penetrate the main defences protecting the Ruhr and north-west Germany, the fighter and anti-aircraft belt, a particularly lethal area. In Norway we had extremely difficult terrain, making parachuting in the mountains very hazardous both for the agents and for the air crews. And then Czechoslovakia, as Group Captain Hockey has said, involved a very long penetration across enemy territory, right across south Germany, a very long way out and a long way back. We carried out our operations and this was usually when there was a special urgency. We sometimes dropped agents in the dark period with no moon, and these were often what we call blind drops – there was no reception committee on the ground and this method had security advantages, but then there was always the risk of injury in the parachute landing. But it was the moon period which dominated our lives, the moon period was all-important to us and we were very conscious of it all the time.

The tactics we used were to fly to the enemy coast at low level to avoid radar detection and then to pull up to about 1,000-2,000 ft crossing the coast to be able to identify one's position accurately by visual means, but with Gee if one was getting a good signal we could penetrate at low level. Once over enemy territory we usually kept fairly low, 500-1,000 ft depending on the terrain, to avoid radar detection. Routing was always very carefully planned to avoid all known defended areas, such as enemy airfields, and very accurate map-reading was essential and this needed a great deal of training and practice and close co-operation between the captain, the navigator and the bomb-aimer in the nose of the aircraft.

All through 1943 the intensity of operations increased and then in early 1944 the American squadrons arrived on the scene, part of the Eighth Air Force, similarly engaged on special operations for SOE and also for the Office of Strategic Services, the OSS, the American equivalent of SOE. They were based at Harrington, near Bedford, not far from Tempsford and we worked very closely together and in the early months they came over to Tempsford quite a lot and learned from our experiences. They were flying B-24 Liberators which were ideally suited to the task and they had an excellent range and payload, and the addition of the American squadrons more than doubled the available resources, and so you can see that the build-up was gradually taking place to support our eventual return to the continent.

The Main Force bomber squadrons of Bomber Command by this time were fully equipped with four-engined aircraft, Halifaxes, Lancasters and Stirlings but the Stirlings were not capable of climbing to high altitude with a full bomb load and suffered heavy losses, and as a result they were largely withdrawn from main force bombing operations and became available for low level work, parachuting arms and ammunition in the period immediately prior to D-Day. And by using Stirlings en masse and often in daylight in the latter stages, very large quantities of weapons were supplied to the *Maquis* groups, particularly in France. And so a whole effort in support of the resistance, especially in France, reached a peak in preparation for the Normandy landings in June 1944.

To conclude, I would just like to say a word on security which Professor Foot touched on. These operations demanded a very high degree of security as you can imagine. The risks were very high and could involve whole networks of agents in the occupied countries. When we parachuted agents into the field we never, or very rarely, knew who they were. We perhaps knew their codenames but that was all. They were brought to Tempsford at the last moment from a special holding unit, a country house in the vicinity, and they were brought on to the airfield with as much secrecy as possible. They were taken to a special building where their clothing was thoroughly and finally checked for any incriminating evidence such as English markings, rail tickets, cigarette packets and so on. And then they were given their false identity papers and finally fitted with their parachutes with the RAF despatcher present. And they were then taken to the aircraft dispersal where the Halifax was waiting ready to start engines.

It is remarkable, I think, the degree of security that was achieved on the station amongst the aircrews and the ground staff. It is only since the war that we have got to know many of these people who we dropped into occupied countries and we have established many friendships which have endured for the last forty years, right up to the present time.

Group Captain Hugh Verity

Between October 1940 and September 1944, 400 people were picked up by moonlight from France alone. A handful of pilots in half a squadron landed their Lysanders or Hudsons secretly on rough fields

marked by a few torches. Now this was a very small commitment of aircraft and aircrew which returned a major contribution to the success of the French Resistance. Other Lysanders based in Italy did pick-ups in northern Italy, Greece and Yugoslavia between May 1944 and April 1945. Dakotas did them in Yugoslavia and Poland. Now all this started, as you have heard, when the British spy, if I may use that word, Pilot Officer Phillip Schneidau, was picked up near Fontainebleau in October 1940 in a modified Lysander. Ron Hockey told us that this flight ended in Oban in western Scotland and you may be wondering why. They had together designed a flare path of three torches (they actually worked this one out on the tablecloth at *Oddenino*'s) but the flare path was three torches tied to sticks, 150 yards long and 50 yards wide – an inverted L. The Lysander was modified by the removal of all armament and the fitting of a fixed permanent ladder on the port fuselage, so that the agent could climb into the cockpit. Well now, what went wrong? I'll tell you what went wrong. First of all, on taking off, a German sentry's bullet went through the compass. The next thing was that, to make it easier for Phillip to climb in, Wally Farley had taken off the roof and it was pouring with rain, so the radio set had got soaking wet and wouldn't work; then they had cloud all the way up to about 16,000 ft where it was very cold, and the only way they could let down was to wait for a gap in the cloud and that didn't happen until they were over Scotland.

In 1941. the Special Duties Flight based at Newmarket racecourse used airfields near the south coast for staging pick-ups, much closer to the target areas in France. In that year Gordon Scotter did two pick-ups and Squadron Leader John Nesbitt-Dufort did three including the first for SOE. In December 1941 when the flight had grown into 138 Squadron, Flight Lieutenant Alan Murphy, known as 'Sticky', attempted the only pick-up ever in Belgium. He was ambushed, as a result of treachery in the network, and managed to bring his Lysander back to Tangmere with 30 bullet holes through the aircraft and one through his neck.

In February 1942, when 161 Squadron was formed, it took over the Lysander Flight. This new Squadron was commanded by Wing Commander 'Mouse' Fielden who had been the King's Pilot and Captain of the King's Flight. Nesbitt-Dufort was hiding in France, having failed to penetrate heavy icing in cloud on the way home from

a pick-up. A month later Murphy rescued him and his passengers in a borrowed Anson. By June 1942, Murphy had completed five successful pick-ups and he was replaced as CO of the Lysander Flight by Squadron Leader Guy Lockhart who had done his first pick-up as a flying officer in March. Just work it out – flying officer in March, squadron leader in June! In August his flare path was laid over a ditch by an agent who later seemed to be drunk, and that finished off that Lysander. Lockhart himself was picked up off a beach by a felucca from Gibraltar, crewed by a rather strange part of the Royal Navy. He, Guy, flew back to Tempsford a fortnight after his crash. The third pilot to leave a Lysander in France in 1942 was John Mott who was bogged in the mud near Bourges. He was imprisoned but he later escaped. In October 1942, Group Captain Fielden took command of Tempsford and, as you have heard, Wing Commander Pickard took over 161 Squadron.

It was these two who pioneered the use of Hudsons for pickups, twin-engined Hudsons weighing 11 tons, and one of these was the King's personal aircraft, which 'Mouse' Fielden had kept by him.

Now, while Lysanders could squeeze in three passengers, the Hudson could take ten. They needed strips 1,000 yards long, compared with the 500 yards which was enough for the Lysander. The Hudson's so-called flare path was 450 yards long and it consisted of four bicycle lamps, plus a fifth to the right to show how wide the strip was. 'Pick' did the first successful Hudson pick-up in February 1943. With a navigator, a wireless operator, Gee, and a radio loop for bearings, it is obvious that the navigation of the Hudson was easier than the pilot's task in a Lysander – he had to hold a map in one hand and fly the aircraft with another and I am going to go into this in more detail before I sit down if you'll permit me. But of course landing a Hudson was a very much more difficult task than landing a much more manoeuvrable Lysander, and this was particularly difficult on a dirty night. In 1943, 161 Squadron's Lysander Flight had a very busy and a very lucky year, at least until November. Over half the successful landings in France from 1940 to 1944 were completed in 1943 – that is 104 out of 183 Lysanders and 19 out of 36 Hudson landings. Six of these Hudson landings were by Wing Commander Hodges, who commanded the squadron from May 1943 to March 1944, after commanding the Halifax Flight of that squadron.

Now to the ground side in France. In spite of heavy losses during the summer, the networks of agents in France were building up during 1943 and needing more and more pick-ups as well as parachute drops. They worked for various intelligence organisations, co-ordinated by MI6, for General De Gaulle's resistance, whose air operations were laid on by SOE, for SOE's own French section and for MI9's escape and evasion lines. The agents responsible for finding fields and receiving aircraft, most of whom had been trained by pick-up pilots at Tempsford, included Paul Reviere, who handled 144 passengers on 14 operations, mainly near the Saone, and Henri Dericourt, of whom you have heard, the double agent, who handled 87 passengers on 15 operations, mainly near the Loire. One didn't know at the time that, because Dericourt's security was important to the Germans, we had a safe conduct from the *Luftwaffe* for those flights! It would have been rather helpful if we had known that!

Losses of RAF pilots and aircraft were surprisingly light, and due more to fog and mud than to enemy action. Although two Hudsons were bogged for hours in mud, not one was lost. Thirteen Lysanders were lost, four were shot down over France, four crashed on landing in France for various reasons, three crashed in fog on returning to England and two were inextricably bogged in mud. Seven of these 13 pilots survived, including one who is sitting in the front row, and only six were killed on pick-up operations. On the other hand, the reception teams and the farmers and their wives who sheltered the agents and their passengers had heavy losses, and many of them died in concentration camps in Germany.

The RAF's operational control of Special Operations was streamlined as you have already heard – I would just like to say a word about Air Ministry approval of the fields we landed on. The details of each field were sent to Air Ministry AI2c by the air liaison sections of MI6 and SOE. Fields for landings were then specially photographed by a photographic reconnaissance unit – high flying Spitfires from Benson – and stereo pairs were scrutinised to see whether the fields were acceptable for landings. And then the decision about whether the op was on on a particular night or not was made at Tempsford in the light of the rather ropey weather forecasts that were available in those days.

So much for a thumbnail sketch of the history of pick-ups. But I

have been asked to go into some detail in answer to a question which I am often asked – How did we find the fields? There are several Lysander pick-up pilots in the audience who may well give you different answers, but this is my answer, because we did generally find them.

Two-thirds of all pick-ups attempted were successful, and failures were often because of fog or very low cloud, and sometimes because the agents couldn't make the rendezvous. Very few pick-ups failed because of enemy action or errors in pilot navigation. With only a voice back-bearing over the Channel, a map, a compass, a clock and blind flying instruments, how was it done? Well, there were six things one had to do, and four of them before taking off.

The first was to plan a route avoiding *Flak*, with a good landmark at the end of each leg. Second, cut half-million maps to cover 50 miles on each side of the planned track, and fold it like a concertina. Now this is an actual operational map from 1944, not one of mine, I was too security-minded to keep target information like this, but another pilot's widow was kind enough to send it to me, and you will see that entry point here near Caen, and the track marked down here past Blois, down to near Issoudun, the gen card here with the navigational detail for each leg, there and back. And then in the target area (that was a half-million map), a quarter-million map like this giving you the detail on the approach to the actual target. Having prepared the map, the third thing to do was to study it for an hour or two before take-off, memorising the shapes and the compass bearings of major landmarks. Fourthly, one had to calculate the gen card in the light of forecast wind, and then, fifthly, and this was the first thing you had to do after taking off, you had to fly the planned headings and speeds very accurately until the error in the forecast wind showed up because you had drifted off your planned track. Then you had to do a bit of mental geometry in the light of the different wind, and adjust your heading and of course, the sixth thing, very obviously, map-reading when weather permitted. I mean, very often you couldn't see the ground on the way to the target, so you couldn't do any map-reading, but when there was a clear bit and you could see the ground, that obviously was vital. And for this water was the best landmark, coast, rivers or lakes, and, after that, forests and railways, and the last leg, which could only be a couple of minutes long, really, had to be from a really certain

visual fix, a particular village or stream, or railway crossing or something like that which you could be certain you were identifying and from there do an accurate timed run of two or three minutes when, lo and behold, you would see the agreed Morse letter flashing up from the dark ground and that was really quite a thrill.

Chairman

This is the man who delayed a German armoured division for ten days on its way to Normandy.

Tony Brooks

A lot of what I was going to say to you about the 'other end', as it were, has already been hinted at, but I think it is worth repeating in some ways.

I was dropped 'blind' by parachute from a Halifax on 1 July 1942 near Limoges, and I operated in France until overrun by the Allied armies, the French First Army and the American Seventh Army, in October 1944. My organisation was a clandestine one, as opposed to a paramilitary guerrilla type of organisation – as opposed to a *Maquis*. The men and women who worked for me lived ordinary lives every day, worked in the factories, were doctors, farmers, railwaymen, quite a lot of railwaymen, and after they had done their work, in the evening, they had to return home and carry on with their ordinary daily activities. Now my mission in France, the Pimento mission as it was called, and any aircrew may remember doing drops to Pimento, was firstly to attack specific targets such as supplies of sulphuric acid to the submarine bases on the Atlantic coast in 1942, superchargers for aero-engines being made by Pensavia, which I see today is going to be taken over by Lucas, and reinforcements to Italy during the Anzio and Salerno landings when we had to muck about with Hermann Goering's armoured division going through the Mont Cenis tunnel. And then, more importantly at the end, on London's orders, or Eisenhower's orders, to paralyse – that's what it said on my brief – the French railway network in support of D-Day. A small task, I was only 20 at the time, but nevertheless it was very enjoyable. Derailing trains comes naturally. I used to put chewing gum on our toy railway to derail my brother's steam engine when a small boy.

To do this task we obviously needed a lot of demolition stores. We

had a very small requirement for weapons, ie the complete reverse of a secret army. A clandestine organisation with the task of preparing for D-Day was absolutely useless unless we could get out demolition stores, of various sorts, not just explosives, but also incendiaries and a thing called abrasive grease, which is a way of improving the movement of railway trains! We had to get these stores as near as possible to the targets that we were to deal with on D-Day. The only way we liked to do this was to get the RAF to come along and drop them as near as possible, and by as near as possible – I mean say 100 km. But (I don't mean an error of 100 km) I mean within 100 km of our target we would have a dropping zone where we could get at the stores. But in the earlier part of the war, when Whitleys were dropping to us in October and November 1942, my first two drops, they would drop north of Lyon; but my targets for dealing with sulphuric acid were down near the Pyrenees. This meant that we had to shift the explosives across France, a very difficult task, and a task, if you were caught, carrying the death penalty. The major casualties in my organisation, seventy-two people in all, were caught shifting explosives from A to B.

Now, in the early days, the south-west of France, down near Toulouse, was where the *Das Reich* SS Division was located, and this was one of my top targets in 1944, the drops by parachute of stores down to that area only began right at the end of the winter of 1943 and then the spring of 1944. You've already heard about the way the system worked – there was a BBC message on the radio, listened to after the news through the jamming – that terrible racket! – at 21.15 and then, if the message came through, the reception committee, who only knew their own dropping zones, perhaps three or four, and the messages for those particular drops, would hear this and they would go out on foot, or on bicycles after curfew to the field, which, when we could, we tried to make 400m by 400m. If the operation was successful they would have to pick up the containers, in the early days only three or four: in 1944 sometimes seventy-two containers on the ground – that is quite a lot of stores to shift. After having picked up all the equipment and hidden it away they then had to go home and then clean up and then go to work without looking too excited the next day.

When an operation was successful, the fact that the powers that be in the UK thought it worthwhile risking a valuable aircraft and a

highly-trained crew to fly 750 km to drop to us – a scruffy bunch of terrorists on the ground – 150 kilos of stores – it was a terrific boost to their morale.

The early light pattern was a triangle with pocket torches, *les piles vindaires* as they were called, with red sweet papers on them. I consumed a terrific number of lousy sweets to get the red sweet papers, but the RAF complained about this after a bit, and we went over to white lights and the L formation. Now the light pattern was laid out in the field, indicating, as it was an inverted L, indicating to the pilot the direction of the wind, and the speed of the wind indicated where we put the lights in relation to the dimensions of the field. Windspeed was calculated by a lady's stocking with the heel cut off and held up in the wind on a stick or by hand, and depending on the angle we knew that if it was 45 degrees it was 30 km an hour and it was pretty dicey.

It was very rare that we had in the early days containers outside the DZ: occasionally they did, but they never landed in the middle where we always had the cart, the wheelbarrows or whatever to shift the stuff, but nevertheless, the early drops were very accurate. The fact that the RAF could find our small field and actually drop on four of these piddling little torches, completely foxed the French, and still foxes me. But the trouble was when there was a 'no show' and the message had come out perhaps two or three times during the moon period, morale would go absolutely right down into their boots, and the fact that these people risked their lives, moon period after moon period, to go out or sit by and wait for a BBC message and then go out to the field. I might tell you in the better weather we used to poach crayfish in the streams, and have a portable radio, but nevertheless we used to sit around waiting for this, which used to put their morale down very much indeed. And it was very difficult to explain to them that over the UK there might be fog, although it was a beautiful clear moonlit night where they were, or that the low ground mist was hiding our torches from the pilot, although we could see the Halifax circling around in a great big sort of S looking for the DZ.

But also we had a difficulty when a drop was delayed. Contrary to most clandestine networks or contrary to most networks, I was fortunate in not having a wireless operator. I had a very rapid courier system through Switzerland, where I had been brought up as a kid.

Thanks to French customs men who are after all part-time smugglers, or the other way round, I never quite know, and the railwaymen, it only used to take five days from my headquarters in Lyon to Head Office and back again for me to get my instructions, which was a jolly sight quicker than by W/T, ciphering and skeds and moving the radio set and so on. And so, one of our problems was that we would have to have a method of telling London that the chap had sown or ploughed the field that we were going to use as a DZ and this meant that each team had to have an alternative field in case the peasant would say, 'Look, you can do it till the end of the month but then I've got to sow,' and of course if it was all nicely smooth and harrowed there would be a hell of a lot of round holes where the containers had gone and if we'd driven a cart across it, he took a dim view. That was all right when the peasant was on our side; sometimes of course the best fields we had were ones where the peasant was on the other side and was hostile, because then we didn't really worry much what we did to his field.

In late 1943 SOE decided to standardise, and it has already been mentioned, the preparation of the build-up to D-Day, the increase in the need for containers and stores, headquarters decided to make standardised loads, ie a fifteen-container load on a Halifax would be so much weapons, so much ammunition, so many rifles, so many dressings, food, tobacco and possibly a tiny amount of explosive, which meant that we were continually getting vast quantities of weaponry which we didn't want and we had to go and hide away somewhere. And it meant also that we had to organise an unnecessary number of drops to get the stores we wanted, therefore aircraft were being put at risk unnecessarily and so were we on the ground, and so, if ever there is a third war, which I hope there never is, anyway not in my time, that this should be very carefully looked at. We've worked out on the ground – I was over in France only a month ago with one of my most successful reception committee operators, Henri Mander – we worked out that we could have had all the stores we needed and all the weapons we needed with 30 drops instead of the 100 successful drops we did have.

Now the next point which I would like to make is also the way stores were packed, or delivered rather. There were two types of containers. The C-Type, which was like a long tubular suitcase which

had three 50-gallon drums in it and was all held together – nice and solid – very heavy. The other type was an H-Type, which was five canisters which were held together by two rods from the cushion at the bottom to the parachute box at the top with two rods on each side. If the ground was at all hard, either rocky or frozen, on contact with the ground they broke open. That didn't matter if you were in guerrilla country because the chaps could pick up these smaller units, which had webbing straps on them, put them on their backs, and scarper. *They* didn't worry about leaving a few Whitworth-threaded bolts lying about in a French field. But our dropping zones, some of them were football fields, things of that sort, were very near a town. I was working just before I came out, I was looking at it, and we had about thirty dropping zones which were within 25 km of the second biggest city in France. So to *us*, leaving a bit of hardware in the middle of a field was absolute death. So we loathed the H-Type. And again, I think, from our point of view, it was much easier to get four men to lift a C-Type container or dump it into a cesspit and then come back the next day and collect it. and sort it out if we were a bit rushed on the ground.

We noticed, of course, at the end, with the terrific build-up for D-Day, that the standard of dropping accuracy did drop off. And this I think is fairly obvious; it was because of 38 Group, wasn't it? – which were not of the same skill and training as the Special Duties Squadrons.

Notwithstanding these various problems we did have 100 successful drops and received 140 tons of stores. And we had 122 dropping zones marked out and registered in London and all they needed to do was to broadcast a codeword at the beginning of the moon period and I knew which DZs were going to be operating that month, and then teams were alerted and then they listened for their individual messages each night.

I haven't included in those figures the drops that we had on what we used to call in 1944 – I think it was about February or March 1944 – we were asked to provide 'dump grounds', ie grounds that would be manned throughout the moon period so that if the RAF could not find them, because of low cloud or no show-up of the team, the reception committee, they didn't fly all the way home with their stores as they could drop them to someone who could use them and on one occasion

we had over 100 containers but, thank goodness, that was in August 1944 down in the south-west and we were pretty well, at least a chap called Colonel Starge (Hilaire) was pretty well in command of the area by then, and so there was no disaster. But we did have several drops of 72 containers and that needs an awful lot of manpower on the ground to actually shift it.

BOOK REVIEWS

RAF Flying Training and Support Units since 1912 by Ray Sturtivant. Air Britain; 2007. £37.50.

This is an updated and extensively revised edition of a book that first appeared ten years ago. It is a real *tour de force* providing the essential facts (dates of formation, disbandment and changes of location plus a brief summary of function, examples of specific aeroplanes on charge and, where appropriate/available, some indication of the numbers involved) about practically all RAF, and RFC, units, world wide, other than the (aeroplane) squadrons that have been adequately recorded elsewhere, from 1912 to date. The spectrum runs from Command HQs, down thorough Groups and Wings, taking in all the OTUs, OCUs, HCUs, AFUs, FTSs, ANSs, B&GSs, MUs, RSUs, etc along the way. That batch of abbreviations will be well known to most members of this Society but RAFFT&SU's glossary runs to five pages and has something like 750 entries, so this book will also tell you about, for instance, the far less familiar BBU, BCRS and LAAGS of WW II, the CDCF and IAAD of the 1920s and the various SoMAs, TDSs and SoAGs of WW I.

The parameters that governed a unit's inclusion in the first edition were that it needed to have 'owned' an aeroplane at some time, or to have been involved in training aircrew or controlling aircraft operations, although these 'rules' were interpreted fairly liberally to permit the inclusion of, for instance, Staging Posts, the OASC, and various OCTUs and Staff Colleges. The net has been considerably widened for the 2007 edition which now runs to some 8,000 entries, a third of them additions, and with amendments having been incorporated to some 2,000 of the original selection. Among the more significant additions are a variety of Marine Craft, including Air-Sea Rescue, Units, the numbered Serving Commandos and Servicing Echelons, and a bewildering array of Aviation Candidates Selection Boards, Recruit Centres, Personnel Transit Centres, Personnel Holding Units, Personnel Despatch Centres and the like. Another important gap has been filled by the inclusion of details of the Balloon Flights and Squadrons.

Since units are listed alphabetically by title, RAFFT&SU is virtually self-indexing, although one may have to use one's intuition

on occasion. For instance, the SofTTs are under 'T' for Technical Training, not 'S' for School. On the other hand, while the Air Headquarters Middle East Communications Flight is under 'M', Headquarters RAF Middle East is under 'R'. So, if you do not find what you are looking for where you expected to find it, persevere; it is almost certainly in there somewhere. If you know where the unit was, of course, you can find it via the very useful cross-index by place name which will take you to the relevant page(s). To assist the many folk who are chiefly focused on squadrons, there is even a cross-reference to the units in which they happened to be mentioned, notably the wings and bases to which they were subordinated.

Errors? In a work of this size and complexity, there are simply bound to be. That said, they are, I am sure, few and far between, although I did spot one. An AONS was an Air Observers Navigation School (not an Air Observer & Navigator School) – it is correct in the glossary, but not in the actual entries. Photographs? Yes, about 200 of them, all of aeroplanes actually operated by units identified in the text, running from Handley Pages of WW I via Harts, Harrows and Hornets to today's Hercules and Harriers.

Astonishingly, while this edition contains substantially more information than its predecessor, it is presented on fewer pages, 336 *vice* 368 – a triumph of the typesetter's art. Furthermore, the new edition uses a higher quality, coated paper which makes it much more pleasant to handle. While this book is undoubtedly excellent value for money, it is not cheap – unless you join Air Britain, of course, in which case you can save yourself £10.

Ray Sturtivant, ably assisted by John Hamlin, has added yet another feather to his cap with this essential work of reference. Mine is never far out of reach.

CGJ

History of Air Intercept Radar & The British Nightfighter, 1935-1959 by Ian White. Pen and Sword; 2007. £25.00.

This well researched and highly detailed account opens with the pre-1939 experiments to build a radar set light enough and small enough to go into an aircraft, and ends with the full deployment of the Gloster Javelin force in 1959. Its 326 pages take the reader through the problems of building a working AI radar, getting it into production,

into service and then into action. This, against a background of wartime shortages and competing priorities. As a separate, but equally important matter, it describes the problems of recruiting people with the intelligence to become effective AI operators or radar technicians, and of training the instructors to teach them.

It was well into the spring of 1941 before Fighter Command was able to bring together the disparate elements of an effective night fighter arm. By then it had six squadrons of Beaufighters equipped with AI Mk IV either fully worked up or in the process of doing so. Eight Ground Controlled Interception radars were in position to cover the south and much of the east of England, to direct them into action. At last Britain had a night air defence system worthy of that title.

Then in June 1941, as Britain's air defences were getting into their stride against the night raiders, Adolf Hitler packed off the bulk of his bomber force to airfields in central Europe in readiness for the attack on the Soviet Union. Few of the aircraft and crews would return to attack Britain, when they did the defenders exacted a heavy toll.

For this reviewer's taste the author strikes the right balance in the depth to which he goes with his technical descriptions. However, those who wish to skip over these can do so without losing the thread of the story.

Quibbles? This reviewer has a couple of relatively minor ones. It would have been nice to have had some photos of the various items of equipment. The only ones in the book are seven images on the dust jacket, which lack captions and therefore convey little useful information.

The other quibble concerns the treatment of the Gloster Javelin. The author goes into great and fascinating detail on the failings of the other night fighter types, but there is a lack of similar criticism of the Javelin. That might be taken to imply that it was perfect, and it wasn't! The aircraft exhibited some tricky handling traits, and during its service life stalling and manoeuvres in the vertical plane were prohibited.

Overall, however, this book can be strongly recommended to anyone interested in following the evolution of Britain's night and all weather fighter force during World War II and the early part of the Cold War.

Dr Alfred Price

RAF Harrier Ground Attack Falklands by Jerry Pook. Pen and Sword; 2007. £19.99.

'It does exactly what it says on the tin', could apply to Jerry Pook's graphic account of RAF Harriers in action in the Falklands campaign where the ponderous title *RAF Harrier Ground Attack Falklands* describes exactly what is contained in this fascinating book. It is based on the diary which the author kept during his time as a Harrier Flight Commander spanning the weeks of Operation CORPORATE when No 1 Sqn was embarked aboard HMS *Hermes*. By the spring of 1982, ten years after converting to the Harrier, he had gained wide experience in the ground attack and reconnaissance roles in the Hunter in the Arabian Peninsula, in the Harrier both in Germany and in the UK and, while on exchange duties elsewhere in NATO, flying the RF-104G Starfighter. Thus he is well qualified to publish his views, many of which are contentious.

The author reminds the reader that the RAF had very little experience of operating the Harrier from ships. His squadron had carried out trials some twelve years earlier on board the conventional carrier HMS *Ark Royal* but the aircraft modifications identified for regular maritime activities had not been incorporated. Although several of these were common to the Sea Harrier it took time to prepare the RAF aircraft for the campaign and to train the pilots for deck operations where he describes the pressures which affected his unit during the preparation for the deployment to the South Atlantic. The transit from Wittering via Ascension and cross decking to and from *Atlantic Conveyor* to HMS *Hermes* are described in detail, as are the inadequate arrangements, both domestic and operational, to accommodate No 1 Sqn on board the carrier. Clearly, the relationship between the squadron and HMS *Hermes* was difficult and it is no surprise that the patience and diplomatic skills of his Boss, who was the senior RAF officer on board, acted as a shock absorber between the captain and the squadron pilots. At working level the author reserves praise for the RN flight deck crews who performed superbly throughout and there appeared to be an easier bond between the Harrier and Sea Harrier pilots where, as an experienced Flight Commander, Jerry Pook's status helped to preserve harmony.

The initial planning assumption was that the Harriers would

become attrition replacements as day fighters to cover Sea Harrier losses, hence the urgent modifications to enable the carriage and launch of the Sidewinder, but this was overtaken by events. Of the six Sea Harriers which were lost, only two were thought to be the direct result of combat operations, one to anti-aircraft guns and one to a surface-to-air missile. So the traditional, but more risky, role of the RAF Harriers, offensive air support, for which the pilots were trained, became the main reason for the squadron's presence, leaving air defence to the specialist Sea Harriers. However he does admit to being slightly envious of the air defenders' more benign role compared to that of the mud movers who were being placed regularly in harm's way. He goes on to suggest that the Harriers could also have been tasked to provide visual air defence against Argentinean air attack using Aden guns and the excellent AIM-9L Sidewinder. Perhaps this was not altogether a balanced view in the face of the high volume of ground attack tasking which faced No 1 Sqn's small number of aircraft and pilots.

His narrative style captures vividly several dramas in his cockpit where the reader can sense the tension of low level attack and reconnaissance operations while in action. The author and his colleagues were hit several times by ground fire, sometimes following a second pass over the same target, an ill-advised tactic but necessary where target acquisition was difficult. On one occasion battle damage to his aircraft resulted in a major fuel leak which led to its loss when he ran out of fuel and was forced to eject during his return to HMS *Hermes*. Two days earlier he had flown one of the three Harriers which attacked Goose Green on 28 May in support of the beleaguered 2 Para. This mission was described by the ground force commander, Brigadier Julian Thompson, as crucial to the outcome of the battle and led to the capture of the settlement and surrender of Argentinean forces in the area.

He is very critical, repeatedly, of the Royal Navy's command and control of these vital ground attack assets and the inadequate tasking and briefing procedures on board. Perhaps his evident anger and frustration serve to counter some of the views expressed by Commander Nigel Ward in his book, *Sea Harrier over the Falklands*, where the latter made scathing reference to RAF actions in the South Atlantic. In Ward's eyes the RAF should have been restricted to

supporting the RN's war and that operations by the RAF, such as the BLACK BUCK Vulcan raids, contributed little and detracted from the associated PR visibility which the RN wished to retain exclusively. To illustrate this bias, Jerry Pook cites the desperate need for additional Harrier GR3s to replace those lost in action and the refusal by the captain of HMS *Hermes* to accept such reinforcements which were planned to fly directly to the ship from Ascension Island, some 3,800 miles to the north, taking fuel from Victor tankers. In the captain's eyes this was a publicity stunt by the RAF and it took a finely judged intervention by OC 1 Sqn who put his case directly to the Flag Officer's staff, also based on board HMS *Hermes*. The captain was over-ruled and the Flag authorised the deployment of four additional aircraft. After flights which lasted some nine hours these arrived in two pairs, about a week apart, piloted by crews from Gütersloh and Wittering in unique feats of courage and superb airmanship.

The author is critical too of the Harrier's electronic equipment, beginning with the inertial platform which could not be aligned satisfactorily while at sea, despite the use of the FINRAE trolley which, although developed from an earlier model, failed to perform this essential function. So the navigation and weapon aiming computer could not be used, thus committing pilots to navigate using only map and stopwatch and deliver weapons using the HUD's fixed reversionary display. He claims that the IFF, which was essential for operations, was unreliable, as was the reconnaissance pod carried on the centre pylon, and he expresses particular frustration at the radio's performance, particularly when communicating with forward air controllers.

After the cease fire he asserts that his Harrier Force contemporaries in Germany were reluctant to reinforce the Falklands but this is a narrow criticism of his colleagues. The Gütersloh Harrier Force was declared to NATO as a primary asset and despite several approaches to the MoD to reduce this declaration in recognition of the Harrier Force's commitments in the South Atlantic, these pleas were ignored. The station remained under a formal obligation to produce sufficient aircraft and crews to fulfil this political task at a time of military tension in NATO with a Tactical Evaluation of the Force scheduled for September. In the absence of a satisfactory response from MoD, pilot availability criteria were set aside and replacements from No 3

Sqn were sent by Hercules to Stanley by early July. Furthermore some Sea Harrier pilots and two of his squadron colleagues who flew directly from Ascension were Gütersloh men. Also the other Gütersloh squadron, No 4, was preparing to embark several Harriers aboard HMS *Illustrious*, the RN's new aircraft carrier to provide her crew with experience of the aircraft. She was undergoing an accelerated commission to replace HMS *Invincible* as the air defence guard ship pending the introduction of land based radar units and the activation of RAF Stanley with Phantoms.

Following his return from the Falklands, Pook drafted parts of the post-conflict report but records his irritation that, in his eyes, headquarters and MoD staff marginalised the contribution made by the Harrier GR3 and its crews to the successful outcome of Operation CORPORATE. He does not seek self aggrandisement but is puzzled also by the lack of interest from other RAF ground attack and reconnaissance units in hearing and debating the conclusions and recommendations from those involved in the short, but very active, campaign.

Some of the thirty-eight photographs are familiar, although that of the Harrier with its outrigger in the catwalk is printed in reverse, but there are several new illustrations including the author's personal photographs, maps and HUD recorder film which, despite some images being ill-defined, are dramatic. Only one factual error was noted where the author's caption accompanying the vertical photograph of Stanley airfield states that it was the last bomb of the first BLACK BUCK mission which cratered the runway. It was, of course, the first bomb which did the damage. Also some names are misspelt and others wrongly identified but these are very minor observations.

Although frank and outspoken, and in parts unbalanced, the author tells the story of *RAF Harrier Ground Attack Falklands* from his personal experience, both the good and the bad, and in recognition of his bravery and leadership under fire Jerry Pook was awarded the DFC. Setting aside inter-Service rivalry, he and his eleven Harrier pilot colleagues, together with their thirty-six Sea Harrier counterparts, several of whom were seconded from the RAF, were 'the Few' of Operation CORPORATE and any personal account of the air war in the South Atlantic bears testimony to their courage. Despite

his uncompromising views, I recommend this excellent 219-page book as a selective reference for military historians and as gripping reading for fellow combat aviators, operations staff officers and aircraft enthusiasts.

Gp Capt Jock Heron

Black Night For Bomber Command – The Tragedy of 16th December 1943 by Richard Knott. Pen and Sword; 2007. £19.99.

This is a good read and I have no hesitation in suggesting that a better way of spending a winter's evening would be difficult to find.

There are some quite slim volumes that purport to cover, not only a number of war years, but vast intricate campaigns; this modest 260-odd page book focuses on a single day, 16 December 1943, and a specific Bomber Command mission to Berlin and, of course, back again..

I do not like dramatic reconstructions or 'thought up' dialogue, no matter how ingeniously based on probabilities and I was relieved to find that the author has avoided that pitfall, most reported speech being reproduced from first-hand written accounts or from contemporary crew or squadron members and they read pretty authentically.

In some respects, when you are sitting in the comfort of your 21st Century home, it is not very nice to be transported back almost sixty years to be reminded of those atrocious winters of the 1940s – I shudder at the thought. Exactly two years before the events described in this book, I was with No 21 OTU at Moreton-in-the-Marsh, flying, it seemed, nearly all the time in similarly awful weather conditions but without the pressures of actually being on operations. For this reader, Richard Knott has certainly succeeded in recreating the contemporary atmosphere. Once or twice, my spine actually tingled as he describes the events of 16 December 1943, when, with the weather just about as bad as it could be, a formidable force took off on the seven plus hour trip to Berlin. More than 300 of those airmen lost their lives. Read of their time you young men – and marvel.

Some of Knott's book is devoted to statistics and, while I found little to surprise me in the facts and figures, I found it all very readable and was pleased to see this information presented without resort to the sort of hyperbole and unnecessary superlatives that mar too many TV

documentaries.

From a strictly personal point of view, I really felt for those air gunners with heated flying suits and heating for the mid upper. The Wellington of two years previously had had no heating for the air gunners and I, for one, had not heard of heated flying suits, so we just froze and hoped we could walk again after a longish cross country in sub-zero temperatures. No aids for the navigator, just DR and a spot of astro, but I was surprised that the training appeared shorter and less comprehensive in later years than it had been for us and also that crewing-up was still left to chance and a few minutes conversation.

It would be churlish of me to nit pick as the author has, as result of a great deal of painstaking work, gathered together a mass of very interesting information and I would not begrudge him the occasional error. The odd little slip aside, I reckon it is a good 19.99 poundsworth.

Tony Richardson

Vulcan Test Pilot – my experiences in the cockpit of a Cold War icon by Tony Blackman. Grub Street; 2007. £20.00

Stand under the bomb bay of a Mk 2 Vulcan at the RAF Museum at Hendon or at Cosford, look towards either wing tip, and just marvel at the beautiful shape of that extended wing. That sculpting, because surely that is what it is, did not come about by accident or by Computer Aided Design. It came, to a certain extent, from trial and error but primarily from imaginative and consistent application of basic design principles.

In this gem of a book, Tony Blackman, who test flew 105 of the 136 Mk 1 and Mk 2 Vulcans built, explains how the aerodynamic shape of the Vulcan gave the aircraft several unusual flying characteristics; he tells how this most advanced aircraft for its time was made to fly so safely that young pilots like me, with only two year's experience as a co-pilot on top of Jet Provost and Vampire training, could be allowed to captain a nuclear qualified crew and take the aircraft all over the world.

When the 'Ministry of Defence' (surely the Air Ministry then) issued operational requirement OR229 in 1946(!) for a nuclear armed bomber with a range of 3,350 nm at 50,000 feet at 500 kts, not much was known about the flying characteristics of the delta wing so Avro,

very sensibly now with hindsight, built the 707-series of single engined, small deltas. The author describes the development period in detail; then the emergence of the Mk 1 Vulcan and the first flight, by Roly Falk in 1952, just in time for that year's SBAC show at Farnborough – the pilot wearing a grey, pin striped suit, shirt and tie.

And then the hard work of sorting out the more potentially dangerous flying characteristics of the shape especially at high Mach numbers – for example, violent buffeting at the planned cruise Mach number of 0.85 was obviously going to be unacceptable.

Tony Blackman joined the Avro team as Deputy Chief Test Pilot on 1 January 1958 having flown the first production Mk 1 a dozen times as an RAF test pilot (part of the initial evaluation team) at Boscombe Down. Three modifications incorporated into future production aircraft, namely a Mach trimmer, a yaw damper and then pitch dampers, gave the test pilots enough confidence to explore the flight envelope right up to Mach 1.

The author, with impressive recall and research, not least from former colleagues whose help he acknowledges, sets out in two detailed chapters how Avro went about developing first the Mk 1 Vulcan and then the considerably different Mk 2. A short chapter on demonstration flying follows and the final third of the book is given over to analyses of Vulcan 'accidents and incidents' beginning, inevitably, with the infamous Heathrow landing accident on 1 October 1956 where Blackman concludes '……but, in my opinion, the key cause was the pilot coming below his decision height under the great pressure put on him to land and without his accustomed co-pilot to help him by warning him of the aircraft altitude.' Other accidents, including a few I know of intimately, are concisely and, as far as I can judge, accurately and dispassionately described.

Tony Blackman concludes with a chapter about the 'Vulcan (XH558) to the Sky' project – the RAF's first Mk 2 that he helped deliver to Waddington on 1 July 1960, and that was the last to fly in 1993.

He states, accurately, that designing the Vulcan and making it work from its inception 60 years ago to its first flight eight years later, and then further developing it into the Vulcan Mk 2 was a monumental task for Avro, for Bristol Siddeley, for the RAF, and for the politicians who had to justify the project. Ordinary RAF squadron pilots like me

have much to be grateful for.

One cavil: I would like to have seen some discussion of the one black mark that, in my opinion and that I am sure of many ex-Vulcan captains, hangs over the Vulcan's otherwise distinguished history: what did those early test pilots think and say about the lack of ejection seats for the rear crew? When the man who took over command of No 50 Sqn at Waddington from me in 1979, the then Wing Commander Tim Garden, was asked just before he died recently if he was bitter at being so suddenly struck down, he typically said that many of his fellow aircrew had had even less luck and were lost in their twenties and thirties. I know what he meant.

Tony Blackman says in his Introduction that, 'The book is mainly for people not particularly associated with the Vulcan.' Don't you believe him!

AVM Nigel Baldwin

Avro Vulcan by Phil Butler and Tony Buttler. Aerofax; 2007; £19.99.

The thing that rankled with Handley Page throughout the Second World War was the way their Halifax was overshadowed by the Lancaster, which they ascribed to the fact that the Lancaster was capable of carrying far greater bomb loads. Charles Joy, Handley Page's Assistant Chief Aerodynamicist in 1947, told me that they strove to give their Victor a bomb load double that of the Lancaster. But although the Victor could carry 35,000lb of bombs as against the Vulcan's 21,000lb, once again it was the Avro design that stole the limelight. Just as the awesome, preternatural Vulcan invariably starred at air displays, so too books on the Vulcan seem to be churned out every six months or so.

Messrs Butler and Buttler admit that their book 'does not claim to be the ultimate narrative for the type but should be seen as a complementary work to those that have gone before.' They are spot on. Harking back to my flying training days, I will start with the good points such as, 'You strapped in well, Bloggs and you taxied out to the holding point in good order. It was just the section after take-off that let you down.' In like fashion, the illustrations in this book are comprehensive and the reproduction quality is first rate. There is much here that will interest the modeller and the 25 pages of colour photos at the back are particularly noteworthy.

But the words are something else. The prose is laboured, the story unstructured and the information is all over the place. A massive amount of detail has been culled from flight tests reports and specifications and Ministry files, but it has just been dropped in front of us with no attempt at analysis, defining time lines or historical evaluation. And some information is just plain wrong. Avro designers did not start off thinking that the delta was the solution to the Ministry of Supply requirement. The Project Team in Manchester began with a conventional tailed aircraft of 45 degrees sweepback. However, swept wings produce less lift than conventional wings of equivalent size, yet the requirements of altitude demanded greater, not smaller, coefficients of lift. To compensate for this Avro had to increase the swept span, but this resulted in a design of poorer performance that weighed 80,000-90,000lb too much. It took nearly a month to dispense with the tail altogether. Since a bomber carries its load concentrated around its centre of gravity, and as a swept wing increases longitudinal stability, all the old reasons for having a rear fuselage supporting a tail no longer applied and it could be deleted once longitudinal controls were fitted to the wingtips. But even though this gave an immediate saving in weight and drag, the wing itself was still disproportionately large for its purpose and much heavier than required. There was nothing left but to reduce the span. To chop pieces off the wing just meant decreasing the wing area, thereby upsetting all the carefully calculated factors of wing loading, thinness, and aspect ratio. As the wings got broader and stubbier, the Project Team kept the wing area constant by filling in the space between the wing trailing edge and the fuselage. By the time the span had been reduced sufficiently to get the weight within acceptable limits while maintaining sweep and reducing tip chord to give adequate induced drag for maximum range, the gap between the short body and the wing trailing edges had been virtually filled in, forming a natural triangular plan form resembling the Greek letter *delta*. This then was the logical evolution of the distinctive Vulcan shape.

The authors' use of phrases such as 'metal bashing by now was underway' not only grate but also demonstrate a limited understanding of how much advanced technology and structures went into V-bomber design and construction. It is also annoying to see material lifted from other authors' works without any acknowledgement or bibliography.

There is no index, which limits this book as a work of reference. As for the sections on Service History and Memories, the authors are at a disadvantage by their lack of understanding of V-force operations. BLUE STEEL's 'Achilles Heel' was not the time it took to prepare it for operations. It could be a pig to mate all 471 electrical connectors between aircraft and missile but once done, and with volatile fuel on board, the combination sat happily on QRA. BLUE STEEL's Achilles heel was its relatively short range.

From a historian's point of view, it is sad that there is so little new research material in this book. To be sure, the authors have dug up 'what if' archival data on a possible supersonic Vulcan (with that wing root!). But they have largely confined themselves to reproducing other folks' work, such as Nigel Baldwin's presentation on the Akrotiri Bomber Wing delivered to the RAFHS Spring 2006 Seminar. Even when they capture original recollections, they make limited use of them. My old Vulcan QFI, Joe L'Estrange, talks about his time on the Vulcan B.2 but it is a bit of ramble which includes such memorable insights as 'a high rate of descent….was a good way of getting down quickly' and Vulcan crews had 'old fashioned dials, gauges and switches – none of the modern computerised equipment was available as yet.' I think I'm right in saying that the Nav Plotter's Ground Position Indicator, although analogue, was an outstanding piece of computerised equipment for its time. How I wish they had asked Joe what qualities made a good Vulcan crew or what it was like to slow roll the beast!

In sum, this is a bit of cut-and-paste job. There is some fascinating, if arcane, Vulcan material and if you are one of those who argues in cyber space about whether BLUE STEEL Vulcans were officially designated Vulcan B Mk 2As or not, this book is for you. The individual airframe histories also provide a good record. For those looking for new, serious historical insights into a topic that has pretty much been done to death over the last two decades – fear not. I suspect there will be another Vulcan book along any time soon.

Andrew Brookes

Constant Vigilance – the RAF Regiment in the Burma Campaign by Dr Nigel W M Warwick. Pen and Sword; 2007. £25.00.

It is unusual for the author of a Foreword to be asked to review the

book for which it was written. However, I trust that I shall be found sufficiently objective!

Unlike most regimental histories, those concerning the RAF Regiment should always be read in the context of the application of Air Power in war and the success or otherwise of the Regiment in defeating enemy counter-air action. With Allied Land and Tactical Air Forces throughout the Burma campaign uniquely and totally dependant upon the air for offensive support, troop reinforcements, medical evacuation and logistic support, never was the RAF's security on the ground so essential as it was in this theatre of operations. Nigel Warwick has grasped this principle unequivocally throughout his painstakingly researched book, with its copious footnotes, seven colour maps, twelve tactical sketch maps, nineteen appendices, and two pages of bibliography, which stands now as a definitive history, full of eternally relevant lessons for RAF (and Joint) Staffs involved in preparing for future conflicts, let alone for members of the RAF Regiment.

As repeatedly transpires in every major war involving a threat to the RAF on the ground since 1939, as the Japanese advanced headlong into Burma, the desperately-pressed Army could not spare resources from the front line to protect the RAF, whilst every local distraction of the RAF from its primary combat role into self-defence simply compounded the problem. The new RAF Regiment, which in Burma eventually amounted to over 2,500 officers and men optimised for air-base defence, was not found wanting, as *Constant Vigilance* makes clear from the cited despatches and plaudits from the Supreme Allied Commander downwards.

This book, like other RAF Regiment histories, pinpoints many lessons which are as applicable today as they were over sixty years ago. Most pertinent are those concerning the paucity or inadequacy of equipment and ill-conceived organisation. For example, units with the 20mm Hispano as their primary AA armament had no organic Control and Reporting element and lacked self-destructing ammunition. Between them these factors denied reaction time and limited the guns' maximum depression against low-level attack, for fear of collateral damage on the ground. These ineffectual AA guns were never replaced by 40mm Bofors guns, which constituted the Regiment's primary (and highly effective) AA armament in all other theatres, but

as the Japanese Air Force dwindled, they became increasingly less relevant.

However, the RAF Regiment's infantry or 'field' squadrons steadily grew in significance, because there was a potent threat, even during the Japanese retreat, of determined enemy special forces raids against our air installations, resulting in many vicious patrol-level actions. Indeed, with a view to a long war of attrition post-Burma, a parachute assault squadron was formed, for forward air control duties in the planned invasion to liberate Malaya.

Undoubtedly, the RAF Regiment in Burma benefited from bitter earlier lessons in other theatres. In particular, pre-deployment training was taken very seriously indeed. As a result, individuals and units were well prepared at the RAF Regiment Depot and at battle schools to which they were assigned on arrival in India, resulting in the troops' remarkable physical and psychological endurance once deployed. Many marched over 1,000 miles across appalling terrain and in dreadful climatic conditions as the battle-fronts and their associated air forces moved. Moreover, despite wounds and disease, many refused evacuation and some even promotion, so that they could see the war through with their squadrons. Individuals and sub-units were sometimes attached to Army units for experience or as reinforcements, some winning gallantry awards whilst attached. Worst must have been the early months of relative inactivity or at best, low-level patrol work, whilst the Japanese were being held at the limit of their advance and before Allied Command South East Asia (ACSEA) could turn the tide. Yet three years later, in March 1945, when the retreating enemy's last desperate counter-offensive was broken in the crucial battle for Meiktila, an intensive, sustained month-long action, involving British, African and Indian Army units, the RAF Regiment acquitted itself magnificently. The wing commander in command was killed and many other officers and men were killed and wounded, but the Japanese lost even more, whilst the vital airhead remained operational. Meiktila was arguably the RAF Regiment's major encounter-battle of the entire Second World War. It certainly was the last one against the Japanese; and it was victorious.

The Regiment's war did not end with Japan's surrender. Wings and squadrons were moved via Malaya and Singapore into Thailand, French Indo-China and the Dutch East Indies to help hold the ring in

these territories until their own legitimate Governments could reassert their authority. However, considerable fighting ensued in the French and Dutch territories as nationalist partisans, well armed and trained by allied agents as a resistance to the Japanese, turned upon their erstwhile liberators. An RAF Regiment wing HQ and nine squadrons thereby found themselves fighting for a further full year post-VJ-Day, at times alongside Japanese units co-opted as allies.

Nigel Warwick draws not only upon UK and Australian war records, bibliography and photographs, but he has interviewed many of the few surviving RAF Regiment veterans of the Burma campaign. Reporting the perspectives of the individual officers and men on the great events in which they participated, he deftly weaves a tapestry embracing not only the high-level policies and strategies of the war, but also the brutish reality of trench-level life in this worst-imaginable theatre. In doing so, he allays the reader's instinctive suspicions of the old soldier's propensity to exaggerate his experiences, the limited perspectives of very young and junior participants in great happenings and the fogging of their memories over sixty years, by validating the more significant personal anecdotes through footnotes linking them with the historical record. Nevertheless, the veterans' inputs are remarkably perceptive, frequently revealing a sound grasp of the strategic aims. That surely is a tribute to the leadership exercised within ACSEA at all levels, for these men clearly knew exactly what they fought for in the grand scheme.

Air Cdre Marcus Witherow

Freedom in the Air. A Czech Flyer and His Aircrew Dog by Hamish Ross. Pen and Sword; 2007. £19.99.

The Czech flyer here is Václav Bozděck who made his way to Britain via the French Foreign Legion and the French Air Force. He served as an air gunner and wireless operator in No 311 (Czechoslovakian) Sqn which was equipped with Wellington ICs and was the only Czech unit to have flown with Bomber Command. The RAF's liaison and training officer with No 311 was Sqn Ldr Charles 'Pick' Pickard who went on to feature as the pilot in the film *Target for Tonight* and gets a very good press here. By 1942 No 311 Sqn's losses could not be made good with Czech personnel and it was transferred to Coastal Command where it incurred fewer losses and

flew Liberators. In 1945 Bozděck went with the squadron to Prague and took up residence in his own country again. In 1948 he left for Britain once more, this time escaping from communist persecution, and was welcomed back into the RAF. After retirement from the Service he became an entrepreneur in Devon, where he died in 1980.

That is an outline of the book – but what lies between the lines? There is a mixture of interlocking themes. One of them is familiar enough in accounts of No 311 Sqn's actions but those accounts embody a major theme of the whole book – that of Bozděck's relationship with his dog Antis, an Alsatian he had rescued as a puppy during the *Blitzkrieg* in France. He smuggled Antis into Britain to avoid the separation of quarantine and the dog flew with him on bombing missions, being twice wounded by *Flak* and having had an oxygen mask made for him by the squadron's ground crew. Such behaviour drove a cart and horses through Service regulations but Bozděck got round all the obstacles placed in the dog's path, both in the air and on the ground. When the press got wind of what was going on, Antis became popularised as 'The Dog of War', which made it even more difficult for any Service objections to prevail. If animal lovers become alarmed at this point, Antis was not ordered on board by his master but made his own way there. On his first sortie, when the Wellington was *en route* to its target, he emerged from a hiding place he had selected – to the initial consternation of the crew who subsequently found his presence on missions reassuring.

When European airmen arrived they brought courage and skills to the Service and some political baggage. The majority of that baggage was carried by the various politicians who had gone into exile with them, who were concerned with the post-war politics of their nations. The history of the complex wranglings between them and the headaches which that gave to both HM Government and the Air Ministry has been set out admirably in Alan Brown's *Airmen in Exile* (Stroud: 2000) which, I am pleased to see, is cited in the author's bibliography. At the sharp end other issues gained most of the airmen's immediate attention. For example, on arrival many had been embodied in the RAFVR but morale was boosted if they could still see themselves as members of their own national air forces, even if those were under RAF operational control. A good example was the emergence of a Polish Air Force in Exile. Although the Czechs were

less numerous in Britain than the Poles they did gain recognition for a Czechoslovakian Air Force in Exile – consisting of one bomber and three fighter squadrons – but all its members remained in the RAFVR. Politics on a much broader canvas, involving British, Czechs, and Russians, emerge here and there is quite a lot of detail, both about the pre- and post-war political situations in Czechoslovakia. In brief here, the post-war seizure of power by communists resulted in the kind of persecution of Czech individuals – and by association their families – judged to be enemies of the state which was familiar to people in the USSR itself. Bozděck became an object of suspicion for reasons which included his service with the RAF.

In 1948 he decided to escape, leaving his wife and infant son behind but taking Antis with him. The interdependence of this man and his dog appears again in an account of their perilous journey to reach the US Zone of Occupation in Germany. Reliance on Antis' intuition and courage saved Bozděck's life during that journey. When he re-enlisted the 1946 Aircrew Scheme was in force and on p134 the author says that his initial designation as a Sig IVA was equivalent to sergeant in the traditional scheme. I think that corporal is a better approximation. The 1946 Scheme is an arcane episode anyway in Service history and didn't last for long. His post-war service saw him instructing, flying with Transport Command, serving in Nicosia during the Suez crisis and ending up as an air traffic controller in 1961. Antis, long dead by that time, had a well established reputation with the British press and the PDSA, a veterinary charity, had initiated steps which led to him being awarded the Dickin Medal – the animal equivalent of the VC – which was presented to him by Field Marshal The Earl Wavell in March 1949.

Hamish Ross has written an interesting story about Bozděck and Antis. His book is illustrated by decent photographs, has a set of Notes for each chapter and an appropriate bibliography. However, I think that the degree of detail concerning political situations in Czechoslovakia before and after the war – whilst necessary at times to understand the lives of men like Bozděck – may place some strain on a reader not primarily interested in politics. That said, the book is worth reading for the account it gives of an extraordinary relationship between man and dog. Hence, unless you have an informed interest in

Czechoslovakian affairs, you may prefer to savour that account by asking your library for a copy of the book.

Dr Tony Mansell

The Military Airfields of Britain – a series of volumes by Ken Delve. Crowood; 2006-07. £16.99 each.

Between 1979 and 1985 Patrick Stephens (PSL) published its ten-volume *Action Stations* series in which a variety of authors summarised the histories of most of the military airfields in the UK. In effect, Ken Delve has set out to supersede these and, while I am not in the habit of relying on a publisher's publicity material, in this case Crowood's description is hard to beat. It says:

> 'This series of books provides a fresh user-friendly look at the military airfields of the British Isles. The series is split geographically, each book including a number of counties on a regional basis. Entries cover every military airfield within the counties, from WW I to the present day and comprise: brief history of the airfield, construction and use, including decoy sites; comprehensive list of flying units with dates and aircraft types; list of HQ units based at the airfield; details of memorials; maps and plans of almost every airfield; location details; selection of period photographs.'

I would not take issue with any of that. So has it done the trick? Is the new series an improvement? Yes. The tabulated presentation of user units is both comprehensive and far more accessible than PSL's purely narrative approach which left the reader to rummage about in the text in the hope of finding arrival and departure dates for a unit which, in the event, might never actually have been mentioned. That said, there is still a narrative summary in Delve's version which serves to flesh out the raw dates. Similarly, while the PSL series included some site plans, the Crowood books have lots of them. Since these are reproductions of contemporary drawings, they are, inevitably, of variable quality, ranging from excellent to adequate, but they all suffice to indicate the layout on the date in question. Another useful feature is an extract of airfield data as at December 1944 which provides comparative information on runway construction and length, available hangarage and accommodation capacity. Many photographs

are provided, although these too are of variable quality, some because of the nature of the originals but others because they appear to have been scanned from other publications, resulting in tell-tale interference patterns.

To keep the cost down, this series is being produced as softbacks and, regardless of size (the six volumes that have appeared thus far contain between 256 and 352 pages), at a standard price of £16.99 apiece. There must be at least two more to come, as Scotland and Northern Ireland have yet to be covered, along with the East Midlands and its dozens of Bomber Command airfields.

To sum up, these books are useful and, as claimed, user-friendly. The only problem is that, if you are an anorak like me, and just have to have them all, it is going to set you back a tidy sum.

CGJ

The Daily Telegraph Book of Airmen's Obituaries, Book Two edited by Jay Iliff. Grub Street; 2007. Price £18.00.

Some five years ago, Grub Street published a selection of Ted Bishop's obituaries of aviators that had appeared in the *Daily Telegraph*. As its title suggests 'Book Two' offers a further selection, most of which have been written by his successor, Air Cdre Graham Pitchfork, whose name will be familiar to members of this Society. Since the format mirrors that of the original volume, my comments will inevitably reflect much of what I wrote in Journal 28. As before, this book is a substantial A5(ish) hardback, running to some 416 pages. There are no illustrations. There is an index. The entries are grouped under convenient headings: Fighter Boys; Bomber Boys; The Girls; Maritime; Industrialists and Engineers; Test Pilots and so on. Among the 100 folk who feature in this edition, all of whom have died since 2001, are Sir Kenneth Cross, Edward Crew, Sir John Grandy, Jack Furner, Sir David Lee, Frank Carey, Dame Felicity Peake, Sir Ivor Broom, Neville Duke, John Cunningham, Sir George Edwards, Stanislaw Skalski, Sir Christopher Foxley-Norris, Alex Henshaw, Sir Fredrick Page, Pierre Clostermann and Sir Lewis Hodges – to name but a few.

The presentation generally involves an anecdote or two, focusing on the more spectacular of the subject's achievements, accompanied by a summary of the rest of his/her career. Since most of the featured

personalities achieved a degree of prominence in one field or another, their stories are interesting and/or entertaining and the book makes a handy reference to some of the great and good, and to one or two of the more colourful members, of the aviation community. Recommended.

CGJ

ROYAL AIR FORCE HISTORICAL SOCIETY

The Royal Air Force has been in existence for over 80 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 inter-war 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, Dr Jack Dunham, Silverhill House, Coombe, Wotton-under-Edge, Gloucestershire. GLI2 7ND. (Tel 01453-843362)

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 RAF winners have been:

1996	Sqn Ldr P C Emmett PhD MSc BSc CEng MIEE
1997	Wg Cdr M P Brzezicki MPhil MIL
1998	Wg Cdr P J Daybell MBE MA BA
1999	Sqn Ldr S P Harpum MSc BSc MILT
2000	Sqn Ldr A W Riches MA
2001	Sqn Ldr C H Goss MA
2002	Sqn Ldr S I Richards BSc
2003	Wg Cdr T M Webster MB BS MRCGP MRAeS
2004	Sqn Ldr S Gardner MA MPhil
2005	Wg Cdr S D Ellard MSc BSc CEng MRAeS MBCS

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:

Air Marshal Sir Frederick Sowrey KCB CBE AFC
Air Commodore H A Probert MBE MA

SECRETARY
Gp Capt K J Dearman
1 Park Close
Middleton Stoney
Oxon
OX25 4AS
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MEMBERSHIP SECRETARY
(who also deals with sales of publications)
Dr J Dunham
Silverhill House
Coombe
Wotton-under-Edge
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