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Royal Air Force Historical Society

THE PROCEEDINGS
OFTHE ROYAL AIR FORCE HISTORICAL SOCIETY

Issue No 11

The General Secretary

Regrettably our General Secretary of five years standing, Mr B R Jutsum, has found it necessary to resign from the post and the committee.

Group Captain J C Ainsworth has offered his services and has been co-opted by the committee to fill the appointment.

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EDITORIAL

The symposium on Flying Training held at RAF Brampton last October has produced so much material that, perforce, it has filled the greater part of this issue of *Proceedings*.

A further interesting item, and we get lots of stories within stories, has been raised by Squadron Leader Ian Wormald concerning Civilian Flying Training before the war – in fact, it could well be the subject of a seminar at the Yorkshire Air Museum, where Ian may be contacted by those particularly interested in this facet of Royal Air Force flying training history.

Regrettably several items have had to be held over to the next issue, including book reviews and a most interesting article on the 'Y' Service by one of our members.

We still suffer from the perennial problem of indistinct speaking on recordings of discussions and members' unwillingness to give their names each time. This has affected the notes following the flying training papers but Tony Richardson has, as always, done his best to piece things together.

Even more unfortunate is the fact that the recording of the discussion following Sir Frank Cooper's address at the AGM was largely indecipherable and, therefore, could not be used. This was in part due to the poor acoustics in the RAF Club ballroom – which others have suffered before.

Derek Wood

ROYAL AIR FORCE HISTORICAL SOCIETY

Minutes of the Sixth Annual General Meeting of the Society held at the Royal Air Force Club on Monday, 22nd June 1992.

Present: Air Marshal Sir Frederick Sowrey (in the Chair) and 73 other members.

CHAIRMAN'S REPORT

The Chairman stated that once the formal business of the meeting had been concluded there would be a brief discussion period before the lecture by Sir Frank Cooper commenced. The Chairman said:

'It has been a successful year from the Committee's point of view and from members' comments the Society seems to be fulfilling its aim of covering past policy, operations and personalities, of the Royal Air Force. Since the last AGM we have completed two more seminars in the Bracknell series – the 'Royal Air Force in the U Boat War' and the 'Development of Land/Air Co-operation in the Mediterranean War'. The Bracknell series now takes place in the spring of each year so as to dovetail with the Air Power phase of the Staff College course. Incidentally it is good to see that the Commandant at Bracknell figures in the Birthday Honours List as well as one of our members – Lady Humphrey.

The remainder of the programme involves a contribution to recorded history by those who took part in its making. This evening Sir Frank Cooper will speak on the 'Direction of Air Force Policy in the 1950s and 1960s'. In response to many requests, 'Flying Training in the Royal Air Force in Peace and War' is of interest to and personally involved of many members and the Commander-in-Chief of Support Command has asked us to arrange a seminar on this subject at Brampton, Huntingdon on Monday, 5th October.

Our next spring Bracknell session is on the 'Strategic Bomber Offensive' and later in 1993 there will be a seminar at the RAF Museum on 'Indonesian Confrontation 1963/66'. In September 1993 our American opposite numbers are inviting us to a joint seminar in Washington on 'USAF/RAF Co-operation 1945-1961' and we have a busy year with the AGM around midsummer. We cannot give you the actual dates for these functions in 1993 at the present moment as much depends on the Staff College programme, the Americans, the RAF Museum, and also the speaker for the evening of the AGM. Looking further ahead, the Bracknell series includes 'Overlord – the RAF Contribution' in 1994 and 'The War Against Japan – the RAF Contribution' in 1995. We commend this to you

as being a well balanced programme for our membership.

The Society currently has 570 members; more members mean more clout and also improves finances. It does however pose its problems. So far we have not had to turn members away at any functions. The numbers which we are now getting are encouraging but also stretch some of our venues. Unfortunately this affects the young serving officer often being unable to say whether he can be present or not until the last moment. We may have to operate a 'first come, first served' or a ballot system. It would be very interesting and helpful to the Committee to hear your views on which of those two you would prefer. So far we have stood steadfastly against a limitation in numbers because we felt every member has a right to attend and that is why at Bracknell for, example, we have arranged for additions in an adjacent room to the main lecture area. But at Brampton there is going to be a physical limitation on the numbers.

I mentioned that more members mean more money. More money means greater opportunities to invite speakers from abroad; to include extra articles in *Proceedings*; and to commission original work on the history of the Royal Air Force. We have looked very closely at sponsorship as I will mention in a minute but there are limits to what is available. We have tried to obtain non-public funds as this Society is making a real contribution to the historical papers of the Royal Air Force.

None of this would have been possible without the work of a truly voluntary Committee. The Head of Air Historical Branch and his staff, and the Director of the RAF Museum make practical contributions. The remainder of the Committee are all successful in their own fields – the Director of Defence Studies, the Marketing Manager who has already raised over £3,000 in sponsorship, the Programmers who know everybody who is worth knowing world wide, the Editor (with the editorial team) who is amongst the foremost in the field, the Treasurer who keeps us in balance, the Covenant man who wants more, the Membership Secretary who manages the computer, the General Secretary who is the organisational anchor – all of them play a part in producing a Society of which I think you can be proud.'

GENERAL SECRETARY'S REPORT

The Chairman read the General Secretary's brief report.

TREASURER'S REPORT

The Treasurer reported upon the Society's finances during the year as set out in the Accounts sent to all members which had resulted in a surplus of £4,162 compared with a deficit of £571 for the previous year. He

commented upon the various factors affecting the final result.

REPORT AND ACCOUNTS FOR THE YEAR ENDED 31st DECEMBER 1991

It was RESOLVED that the Report and Accounts of the Royal Air Force Historical Society for the year ended 31st December 1991 be received, approved and adopted.

ANNUAL SUBSCRIPTION

It was RESOLVED that the annual subscription of the Society remain at £15 per annum for a further year.

APPOINTMENT OF COMMITTEE

It was RESOLVED that the reappointment of the existing fourteen members of the Committee of the Society (excluding ex-officio members) as listed in the Note to the Notice of the AGM (being held on 22 June 1992) to hold office until the close of the AGM in 1993 be and is hereby approved.

Members of the existing Committee (* = ex-officio member):

Chairman	Air Marshal Sir Frederick B Sowrey KCB CBE AFC
General Secretary	B R Jutsum FCIS
Membership Secretary	Commander P O Montgomery VRD RNR
Treasurer	D Goch FCCA
Programme Sub-Committee	Air Commodore H A Probert MBE MA
	*Group Captain I Madelin
	T C G James CMG MA
	Group Captain A R Thompson MBE MPhil BA FBIM MIPM
	Air Commodore J G Greenhill FBIM
	Air Vice-Marshal George Black CB OBE AFC
	Air Vice-Marshal F D G Clark CBE BA
Members	A Richardson
	D H Wood
	J S Cox BA MA
	*Group Captain N E Taylor
	*Michael A Fopp MA PhD FMA FBIM
	A S Bennell MA BLitt

RE-APPOINTMENT OF AUDITORS

It was RESOLVED that Messrs. Pridie Brewster, Chartered Accountants be and are hereby re-appointed Auditors of the Society and that their remuneration be fixed by the Committee.

APPOINTMENT OF PRESIDENT OF THE SOCIETY

(i) Resolution No 1

It was RESOLVED that, pursuant to Clause 10 of the Constitution, a further clause to be added:

> 13. The Society shall have the power in General Meeting of the members to appoint a President of the Society to hold office for a term not exceeding three years whereupon the President will resign and be eligible for reelection for a further term of three years at the General Meeting in the calendar year during which the term of office is due to expire. The office of President is an honorary post with no executive powers.'

(ii) Resolution No 2

It was RESOLVED that, subject to the passing of aforementioned Resolution, Marshal of the Royal Air Force Sir Michael Beetham GCB CBE DFC AFC be appointed President of the Royal Air Force Historical Society.

Both resolutions passed. A show of hands indicated that a 'first come first served' basis for future meetings was preferred to a ballot.

THE DIRECTION OF AIR FORCE POLICY IN THE 1950s AND 1960s

By the Rt Hon Sir Frank Cooper GCB CMG PC

It is a great privilege to be asked to give this talk. I use the word talk quite deliberately. What I propose to do is to give a personal overview of the situation as it developed in the quarter century after World War II, a period of great change for Britain and for the Royal Air Force.

Before I start I would like to pay a special tribute to Tony Bennell who most generously provided me with essential background material and pointed me firmly in the direction of reading some relevant books. I cannot thank him enough – what is right is due to him and the errors are wholly mine. Let me add that the topic is very wide. Hence, I will be highly selective.

Let me start with some general comments. In the aftermath of World War II the Service Departments and the Chiefs of Staff reigned supreme under the overall supervision of the Cabinet and its Defence Committee, to both of which they had direct access. The Ministry of Defence had little power or authority, indeed, little standing.

By the end of the period the Secretary of State for Defence and the Ministry of Defence were visibly in charge of policy at the expense of the Service Departments and the Chiefs of Staff. Much time and effort was spent on increasingly internecine battles over the share of resources to be allocated to individual Services and individual projects. Strategic policy guidelines were set largely by NATO.

When the war ended Britain had a great deal of overseas territory and saw herself as a great power. But her economic strength had greatly diminished. Twenty-five years later Britain had little left in the way of overseas territory and had become a medium-sized power.

In little more than the decade after World War II much changed. India and Ceylon became independent in 1947, the Palestine mandate went in 1948; Egypt had denounced the Anglo-Egyptian treaty in 1951, and Britain had agreed to leave, other than for some civilian technicians, by 1956; from 1947 Britain was fighting a communist insurrection in Malaya (in 1951 35,000 British troops were facing 8,000 guerrillas); the Korean War started in 1950; Mussadeq had nationalised the Anglo-Iranian Oil Company in 1951; the Mau Mau rebellion had broken out in Kenya in 1952; EOKA was operating in Cyprus from 1955; and there were problems elsewhere not least in the Near and the Middle East. Those extraordinary organisations CENTO and SEATO had been set up.

Nearer home the Cold War had started. There was the Berlin airlift in 1948; WEU and NATO were set up; the European Defence Community had failed; the Brussels Treaty had been a success and brought Germany into the fold of the Western Defence System. We had conscription which did not end until 1962. We became a nuclear power and had the Sandys White Paper of 1957.

By the end of the '60s the Cold War still flourished but our geographical spread had seen vast changes. Malta and Cyprus had become independent but in the latter we had the Sovereign Base Areas. We had virtually left East of Suez both in South East Asia and in the Gulf. Indonesian confrontation had come and gone. Vietnam was having a profound effect on the US but Britain stood firmly aside. The effectiveness and cohesiveness of the NATO Alliance had increased significantly and was at the heart of British defence policy. East/West confrontation appeared permanent.

This is meant as a brief reminder of some of the geo-political events that took place. The pace of political change for Britain's overseas connections was fast but I believe that history will accept that the change was remarkably well-managed and that in some areas, for example, South East Asia, change became a source of strength rather than weakness. Regrettably, the Middle East remains what it has been over a very long period of time – the principal centre of discord within the world.

It was the related fields of establishing a British nuclear capability and of Anglo-American relations in which the course was set for so much that happened to the RAF in the 1950s and 1960s.

There can be little doubt that Britain decided to become a nuclear power simply because it was a natural step to take. There was bitter disappointment that President Truman failed to honour the 1943 Quebec Agreement and the 1944 Hyde Park Agreement which had, *inter alia*, promised 'full co-operation for military purposes'. It was even more disappointing that in 1946 the American Congress passed the MacMahon Act which prohibited the passing of any nuclear information.

Moreover, in March 1947 General Eisenhower and the Joint Chiefs of Staff wrote that '.... atomic energy plants in the British Isles …. would be detrimental to American security. They would be closer to the potential enemy and their operations would require stocks of uranium ore in Britain. For military purposes it would be better if all the ore could be converted into war material and made available to the United States and its allies for use in emergency.' The US felt keenly that atomic plants in Britain might

be captured and that there was a risk of leakage of information: Hence the United States adopted a firm policy that it would have a monopoly of nuclear weapons on behalf of the allies. These strongly held American reservations about Britain becoming a nuclear power were to dog Anglo-American relations for some years to come.

In Britain there was a unity of purpose and a determination to build an atomic energy plant with or without American assistance. The only issue therefore was whether the United States would help and so bring the date of acquisition forward. It was to be some long years before full co-operation was restored. Hence Britain had to evolve its own nuclear policy, largely through the Royal Air Force.

There is clear evidence that the Air Force wanted to enter the nuclear world in a practical sense as soon as possible and I suggest that it played a major part in developing the theory of deterrence.

The Chief of the Air Staff had requisitioned a bomb as early as 1945. The Air Staff had drawn up specifications in 1946 for what were to become the three V-bombers and Lord Tedder had taken the initiative in 1948 to sound out the USAF about acquiring some B-29s. The decision was taken in 1948 to put the Canberra into production as the first nuclear capable British bomber. The position was taken in 1947 that nuclear weapons were for preventing war and, if need be, for retaliation against an aggressor. Furthermore, despite the large number of fighter aircraft which remained in service for some years after World War II, the idea that vast further investment should be made into air defence – a favourite theme of scientists such as Tizzard and Blackett – was rejected, despite the issue of the requirements in 1948 for what eventually became the Hunter and the Swift. There was the fact too that MRAF Lord Portal was in charge of Tube Alloys – the codename for the nuclear programme in the Ministry of Supply.

On the theory of deterrence the British position differed from that of the United States because of our emphasis on retaliation which in turn was caused by our own perception of our vulnerability to air and missile attack. But by May 1947 the Chiefs of Staff could write in their paper on Future Defence Policy of the supreme object of defence policy being to prevent war; of being able to take immediate offensive action, and maintaining a high state of readiness; of increasing the present scientific and technical lead, especially of weapons of mass destruction; and of giving the development of an air offensive force high priority. Later, there were to be references to ‘the deterrent effect that the possession of the means of

retaliation would have on a potential aggressor'. The very stuff and language of Air Force policy for many years to come.

In 1952 the Global Strategy Paper, put together over one argumentative weekend at Greenwich and mainly written by Sir John Slessor, brought together many of the strands of the early post war years. Still written in terms of Britain as the centre of the Commonwealth but with the new main thrust on the need to put more weight on the deterrent effect of atomic and hydrogen weapons. It argued that a potential enemy would hold off if he was convinced that there would be retaliation swift and sure. This could best be accomplished by having an Anglo-American nuclear force, though arguing that Britain could never be sure of the American reaction, let alone the targets America might choose. Slessor had argued, without immediate success, that equipping air forces with tactical and low yield nuclear weapons would enable forces on the ground to be reduced. The global power concept was still strong but the idea that nuclear weapons could well shorten a war if the deterrent failed fell on stony ground. These ideas led to some years of prolonged and acrimonious debate with the Royal Navy who argued, with limited support from the Army, that there would be a long period of broken backed warfare.

All this took place against a continuing background of informal Anglo-American dialogue. The prime movers in seeking the restoration of Anglo-American co-operation were Lord Tedder, Sir William Dickson, and Sir John Slessor who must be awarded pole position as the leading British strategist in the post war period. They were only partially successful, largely because of the United States' legal position.

I suggest some factors in this dialogue need to be given more weight than has been the case. The first was that the long-established independence of the RAF gave it a head-start with the USAF and wartime friendships and the reality of wartime co-operation were crucial elements in the informal dialogue. The second point was that these personal relationships continued both within and without the laws and policies of both countries. For example, there can be little doubt now that the arrangements for the USAF to return to Britain were agreed informally – and perhaps a little more than that – between Tedder and Spaatz in 1946 and subsequently with Norstad.

The third factor was the frankness of the continuing conceptual exchanges between the RAF and the USAF and particularly those which involved Tedder and Slessor, both of whom were quite remarkably fertile in ideas – though these were not always acceptable to the United States! The outcome was a continuing, private, informal and practical liaison

which was much valued by both parties. Most importantly of all the United States Air Force gave a clear message which was of inestimable value throughout most of the 1950s, namely that if the RAF had nuclear weapons; if the RAF had a bomber force; and if the RAF showed it was an effective operational force then real co-operation between the two air forces would come because, whether it liked it or not, the US Government would have to accept the reality of it. This message came across time and time again in the personal contacts and correspondence – most of which remain unrevealed – and far from being a deterrent to the RAF it was an inspiration.

I would like to turn now to the practicalities of policy. When I joined the Air Ministry in 1948 it struck me very quickly that it was a tight knit organisation, that it carried out its business in an orderly manner, that service officers and civilians worked well together, that there was a strong sense of loyalty to the Air Council and there was a Secretary of State dedicated to the Air Force.

The Chief of the Air Staff was certainly rather more than *primus interpares* but his power was not absolute. The importance of the contributions made by successive Air Members for Personnel and the Air Members for Supply and Organisation cannot be overestimated. Their input into policy was crucial and generally ensured that realism triumphed.

From the 1950s onwards the RAF set out to make the V-bomber force the most efficient force the RAF had ever seen. In this they succeeded. This policy was partly inspired by the competitive standards set by Strategic Air Command but more by the continuing need to convince everyone that deterrence was a real concept and that, if need be, there would be retaliation.

There was much debate about the degree of priority that should be accorded to the V-Force and the Air Council eventually decided that it should have special priority but not total over-riding priority .

A vast amount of effort was put into such issues as the selection of personnel for the V-Force and determining their tour lengths; ground handling equipment; works, spares and maintenance.

For many years the basic concept was that of having a V-Force of 240 aircraft located on ten Class One airfields. All these airfields had to be extended and properly supported. The aircraft production programme was pushed ahead and 229 V-bombers had been ordered by the end of 1954 which were enough to produce a front line of about 144 bombers plus 16 photo-reconnaissance aircraft. The epic battle for 240 V-bombers was

fought over a long period of time. The Chiefs of Staff sat on the fence. No one ever challenged successfully the political or military logic of a 240 force but eventually, and just as much for internal RAF reasons as for external ones, the final figure came out as 180.

Every policy aspect of bringing the force to the peak of efficiency was thoroughly and properly examined. The concept of dispersal over a large number of airfields and an exceptionally high state of readiness was conceived and implemented. In addition to the ten Class One airfields dispersal arrangements were made at forty-five other airfields; all had a 2,000 yard runway and a LCN of 40.

Planning was based on the fact that there would be three sorties by a diminishing force. This would follow a period of tension not exceeding 30 days and total deployment to all dispersed airfields would be possible at 1½ hours notice within a time scale of 72 hours overall. Flight refuelling was seen as an increasingly attractive option and co-operation, particularly in terms of operations and targeting, increased with the USAF.

I have no doubt whatsoever that the effort, imagination and reality of producing a truly efficient V force mark one of the real peaks of RAF policy-making translated into reality. It seems to me that during the late ‘40s, ‘50s and ‘60s it was the outcome of a consistency in RAF policy-making that was innovative, creative and drew on lessons from the past. The outcome was a triumphal achievement. The V-Force became genuinely credible as an operationally efficient force which would survive. Its ability to disperse first at home and then overseas, its well publicised ability to maintain QRA and take-off rapidly; the introduction of flight-refuelling, coupled with some spectacular long-range flights, all contributed to driving home to the East, and almost as important to the public at large, that the V-bomber force was able to survive aggression and would be able to retaliate. It was an outstandingly successful demonstration of consistently pursuing and following well thought out and well constructed policies and ensuring that they were properly implemented.

One consequence was that a consistent nuclear policy theme had been established which came further to the fore in 1956 and 1957. Yet in many ways these two years were the watershed years in terms of policy. There was the shock of Suez, major problems about future weapons choices and then cost; and the fact that Britain had been persistently spending something like 10% of Gross National Product on defence. From the second half of the 1950s and throughout the ‘60s lack of resources, indeed continually diminishing resources, became the dominant influence on

policy.

In 1956 the Government commissioned a review of defence policy designed to reduce expenditure. Despite protests from the Chiefs of Staff the initial work was done by four civil servants from four departments who argued that nuclear weapons meant conventional forces should be reduced and hence costs – essentially the air force creed. But when the COS considered the matter they could not agree on a balance of forces. The review dragged on without reaching much in the way of conclusions.

Eventually Britain decided to cut her armed forces very substantially in numbers and NATO agreed to a half-hearted revision of strategy which included reducing BAOR to its famous 55,000 men. Quietly, but perhaps significantly, the Joint Planning Staff noted that SACLANT seemed to be contemplating a different kind of war and policy from SACEUR. The former was based on a major supply and reinforcement operation whereas the latter wanted conventional forces on the ground on the Central Front.

The US was showing genuine willingness to co-operate. The Thor missile agreement was signed, and Thors under double key arrangements were located under RAF command in Britain in 1957, seen by some as a repeat of the B-29 arrangements of a previous decade. The concept of the V-bombers being equipped with air-to-ground missiles – first the Blue Steel Mark I and then the Mark II – to be followed by the Blue Streak IRBM became Air Force policy.

These factors began to raise a variety of issues. The changing US attitude towards nuclear co-operation produced for the first time thoughts about adopting Polaris. It also raised the question of whether other US delivery vehicles might not be available. There were also questions about whether Britain had the research, development and indistrial capacity to cope with both missile and the new aircraft development.

Hence, the British Nuclear Deterrent Study Group was set up and reported at the end of 1959. It concluded that Blue Steel Mark 2 would lengthen the life of the V-bombers only by a short period and that the American Skybolt would be preferable. It argued that the R&D establishments could not handle both marks of Blue Steel and the future aircraft development programme. Furthermore, the Study Group thought that the Blue Streak IRBM could be seen only as a first strike weapon and was not suitable as a delivery system for the British deterrent. On the whole Skybolt seemed to be preferred to Polaris – not least because the Royal Navy showed little enthusiasm for taking on the deterrent which they realised would cost them conventional naval ships and weapons. Duncan

Sandys' attempts (as Minister of Supply) to save Blue Streak failed. The Minister of Defence signed an MOU in Washington in 1960 for the purchase by Britain of 100 Skybolt missiles for the RAF, though there were some doubts about the costs and effectiveness of Skybolt. These doubts proved to be right in 1962 when Skybolt was cancelled by the United States and Polaris was chosen.

Looking back, the second half of the 1950s and early '60s were a difficult period, more so than I thought at the time. Cost estimates were widely out. Costs escalated wildly. The Soviet threat was increasing. The situation was not helped by the Ministry of Supply, industry and the research and development establishments being totally convinced that they could do everything, flushed as they were with the vast increases in their scientific and technical knowledge. More than thirty projects were cancelled. Ministers became increasingly frustrated by being unable to get a firm grip on plans and programmes. There was the confusing and cost-saving lure of renewed co-operation with the United States.

There is little doubt that the equipment part of the defence programme was substantially out of control and overambitious. The Air Force, unsurprisingly, did not see its own way forward with the same clarity as in the previous decade, not least because of the plethora and surging variety of Soviet weapons coupled with the loss of its own future weapons and the Skybolt debacle.

The middle and later parts of the '60s, particularly from 1964 onwards, were even more difficult and even more dominated by economic crises and constraints. This period was characterised by internal strife, continual cuts and a good deal of external unpleasantness with our Allies. From 1964 to 1970 Britain suffered a series of debilitating economic crises, including a major devaluation. The strife and cuts centred around the aircraft programme; fleet carriers; land-based air power versus sea-based air power coupled with what kind of defence policy, particularly East of Suez, should be followed.

Significant reviews of defence expenditure took place in the early part of 1965, three times in 1966, in July 1967 and finally the most fundamental changes of all in December 1967 and January 1968 when the decisions to leave East of Suez and to cancel the F-111 were taken.

The Air Council became increasingly worried about the state of the RAF programme before the Labour party took office. There were serious doubts about the cost of the TSR2. Costs were spiralling upwards and there was a heavy bunching of new aircraft projects in the planned future

programme.

The Labour Party was committed to reducing defence expenditure. It started by looking at the RAF programme as the main item for review and sought from the Navy the justification for the proposed new fleet carrier – CVA01.

The Air Staff produced a paper demonstrating the need and the inter-relationship between the TSR2, the P1154 and HS681 but crucially indicating also possible alternative aircraft which could be purchased from the US. A vast variety of alternative costings was produced. There were frequent visits to the United States. Early in 1965 Ministers decided to cancel the P1154 and the HS681 and buy the Phantom and C-130 Hercules. A decision on the TSR2, on which some £98M had already been spent, was for a while deferred but it was cancelled in April 1965. Fifty F-111s were to be bought mainly for reconnaissance and for use East of Suez. The P1127 was also to go ahead. Throughout all the arguments the heart of Air Force policy had been to sustain its roles and capabilities, to buy from whatever source as many aircraft as possible, and to win by argument the largest slice it could get from the defence cake.

Yet it became clear that these changes were not enough if Ministers were to succeed in their aim of cutting the Defence Budget by 1969 by £400M – rather more than 20%. This opened a much wider and more bitter debate about Britain's role in the world and how it could be carried out, including, in particular, the use of fixed wing aircraft, whether carrierborne or land based, to meet these commitments. There were serious and fundamental disagreements between the Navy and Air Force as to whether land-based aircraft could carry out what the Navy saw as tasks exclusively for naval aviation. A frenetic series of studies was set up looking at intervention scenarios at various locations in the Gulf and the Far East. The Air Staff were marvellously inventive about deploying land-based aircraft from A to B, despite the problems of over-flying. The Navy claimed at one time that the Air Force had invented an island which did not exist. Aldabra certainly did exist though no one appeared to have heard of it apart from the Bird Protectionists who put up a strong case against and the island is now on the itinerary of the cruise ships from the Seychelles to Africa!

The political departments and indeed most ministers were most unwilling to give up any of our commitments particularly in the Far East, though these were not only far in excess of our national resources but caused vast overstretch for all the Services.

The RAF was progressively winning the argument between land-based

and seaborne air power, making much use of the argument that carriers offered a poor return in both military and cost terms for the vast investment needed – not least to protect them. By the autumn of 1965 a strong case had been established against the provision of new fleet carriers and aircraft for the Fleet Air Arm and for the transfer of some tasks and naval aircraft to the RAF. But it also became evident that to find the necessary financial savings would require withdrawal from at least one major theatre. So other studies were initiated into, for example, what should be the size of the RAF for strike and reconnaissance requirements in the 1970s and what should be the future of the Fleet Air Arm if a decision was taken not to proceed with CVA01. Study after study took place.

The Air Force proved, to its own satisfaction, that if it was given a maritime increment then the run down of the carrier force and the introduction of aircraft able to handle the former maritime tasks would coincide. Meanwhile, the political row about the nature of Britain's role in the Far East became more acute. The Cabinet Defence Committee instructed that further comparisons should be made. Two costed schemes, one with carriers and one without, were undertaken and only the second came within the financial limits that had been imposed. The arguments continued throughout January 1966 when the purchase of fifty F-111s was confirmed and the CVA01 was cancelled, despite a final effort by the Navy to try and squeeze the costs of a carrier programme into the defence budget. The Navy Department's costings were unacceptable. Needless to say all this gave rise to a very rough ride with both the United States and our allies in the Far East who were all made aware that Britain's help would depend essentially on the provision by the indigenous countries of the necessary defence facilities.

1966 saw a new Labour Government with a larger majority and further economic crises which led to further studies to find reductions in defence expenditure. NATO had been persuaded to adopt the policy of flexible response, which was preceded by partial withdrawal from Germany of a British armoured division and four squadrons of aircraft. There was much abortive work, particularly in relation to deployment and reinforcement in the Far East, which led to a Government decision for partial withdrawal by 1971 and total withdrawal by the mid-1970s. This was agreed, despite fierce opposition within the Cabinet and from the Overseas Departments. Again there were fiercely hostile reactions from both the United States and from Australia and less aggressive ones from Singapore and Malaysia. The policy of withdrawal became public in July 1967.

The financial position became even worse – so more studies and more cuts. In January 1968 Ministers were forced to decide that the British military presence in the Far East and the Persian Gulf would not be necessary by 1971 and to cancel the F-111.

There were consequences for the air force. The AFVG had been agreed in 1965 but the French withdrew from it in 1967 and the Air Staff set in hand a British study for the requirement of an advanced combat aircraft. Following the cancellation of the F-111 this work was speeded up and the requirement was fully agreed in June 1968.

The cancellation of the F-111 was also partially eased by an agreement in June 1968 for an additional order of Buccaneers for the RAF and in November 1968 by enlarging the order for Harriers. This particular part of the picture was completed in May 1969 when four European countries concluded the agreement which led in the course of time to the production of the MRCA.

In June 1969 responsibility for the strategic deterrent passed from the RAF to the Royal Navy.

It is a quirk of history that two of the decisions of the 1960s had a significant impact on subsequent history. During the fight about aircraft carriers between the RAF and the Navy it was, I think, Tom Pike who suggested, to the then First Sea Lord, the idea of mini-carriers. This was rejected with contumely. But in the end mini-carriers happened.

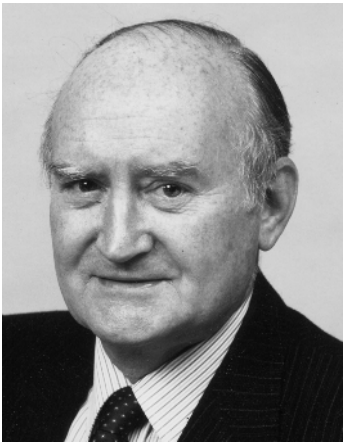
Secondly there was a strong consensus, including the Air Staff, against the P1127. Healey was a firm advocate of its cancellation and so too was Solly Zuckerman, essentially on the grounds that it was not cost effective because it could not fly far enough with a reasonable load. CAS and the Air Staff eventually came round to batting for it on the simple basis that it represented something totally new in aviation. Zuckerman was at least partially persuaded when the Air Force as a whole produced a paper showing it could be operated – and logistically supported – from isolated and dispersed sites. It was saved right at the end of the 1967/68 Defence Review. In due course it became the Harrier which played such a crucial part in the Falklands.

It would be a fair verdict to say that in the 1960s decisions about foreign policy and defence were dominated by financial considerations.

It is difficult not to conclude that since that time we have been struggling to find some genuine policy base. Indeed, we have had no significant defence policy of our own other than the nuclear deterrent.

This is still the position today. Resources, or rather the lack of them,

became the dominant fact, now compounded by changes in the East. One can have many regrets in detail but the major regret I have is that more time and effort was not spent on guided missiles of various kinds. It is in this area, perhaps above all, that we are now lagging behind many countries which are economically, technically and educationally less strong that we are. We must not allow the future to be over-dictated by past glories and tradition .



THE RT HON SIR FRANK COOPER

Sir Frank Cooper was a pilot in the Royal Air Force from 1941-1946. In 1948 he joined the Air Ministry. From 1950-1955 he was, successively, Private Secretary to the Parliamentary Under Secretary of State, to the Permanent Under Secretary of State and to the Chief of the Air Staff. From 1955-1960 he was Head of the Air Staff Secretariat. He was Assistant Under Secretary of State (General and Finance) in 1962 and then, in the same year, Assistant Under Secretary of State (Air Staff) – a post which he held until 1966.

In 1966 he became Assistant Under Secretary of State (Defence Policy) in the Ministry of Defence and then, in early 1968, Deputy Under Secretary of State (Policy and Programmes).

From March 1970 to March 1973 he was Deputy Secretary in the Civil Service Department responsible for the machinery of government, manpower, management services and computers. In March 1973 he became Permanent Under Secretary of State in the Northern Ireland Office, and remained there until March 1976 when he became Permanent Under Secretary for Defence, a post which he held until he retired from the Civil Service in December 1982.

He now works in banking and industry and speaks and writes on Government and Defence. He was a Special Adviser on the defence industry to the European Commissioner for Trade and Industry. He is Honorary Consultant to the Royal United Services Institute, Chairman of the Liddell Hart Centre for Military Archives, Vice-President of the Army Records Society, Chairman of the Institute of Contemporary British History and an Honorary Fellow (since 1976) of Pembroke College. He is Visitor of Loughborough University. He is Chairman of Imperial College and a Fellow of both Imperial and King's Colleges, London.

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HQ RAF SUPPORT COMMAND – ROYAL AIR FORCE BRAMPTON – 5 OCT 92

FLYING TRAINING IN THE ROYAL AIR FORCE IN WAR AND PEACE

0945-1025	Assembly
1030	The AOCinC and the Chairman for the day ACM Sir John Gingell
1035-1050	Flying training in the RFC 1912-1915 – Dr M Paris
1050-1115	CFS and flying training 1915-35 – Mr J Taylor
1115-1130	Wg Cdr Allen and flying training in North America 1917-18 – Grp Capt H Neubroch
1130-1145	Questions and discussion
1145-1215	Pilot entry portals in the RAF expansion 1934-39 –Dr A Mansell
1215-1235	Overseas flying training – World War 2 – Mr E Spridgeon
1235-1300	Questions and discussion
1300-1415	Lunch
1415-1430	Flying training in India – AVM A D Dick
1430-1450	World War 2 operational training – Flt Lt P Jacobs
1450-1500	Heavy conversion training – Sqn Ldr J Currie
1500-1510	Front line OTU in Egypt – Sir Patrick Dunn
1510-1525	Tea
1525-1600	General discussion
1600-1620	Pilot training 1945-92 – Sqn Ldr M Wylie. Introduced by Air Commodore G L McRobbie
Addendum	
1620-1630	Questions and discussion
1630	Closing remarks – Chairman RAF Historical Society

Air Marshal Sir John Willis KCB CBE
AOCinC Royal Air Force Support Command

I hope you will enjoy the surroundings whilst you pursue what is a very full day's programme so I will not take up much of your time now except to observe what is appropriate to be discussing here – training – but also because the Royal Air Force is having a pretty tough time of it right now and I very much doubt that it is going to get any better for a while. We are going to have to take some very unpalatable steps which will not leave training out. We are going to have to chart our way through some pretty difficult waters and therefore it is eminently sensible to know where we are coming from. You will no doubt hear a lot about the cock-ups that we made in the past in training and my staff are here today to hear about some of those which may enable them to be avoided as we move on into a difficult future.

FLYING TRAINING IN THE RFC, 1912-1915
A FAILURE TO PREPARE?

Dr Michael Paris

Despite the claims of the early air historians, when the Royal Flying Corps was formed in 1912, its role was visualised as far wider than the simple gathering of information. According to the White Paper of 1912, the document by which the RFC was established, although reconnaissance was to be the primary function, the Military Wing was also expected to take 'offensive action' against enemy aircraft and ground forces. As the Field Service Regulations of spring 1914 make abundantly clear,

> 'aircraft are usually provided with some form of armament for the attack of hostile aircraft in the air …. Aircraft equipped with explosives or incendiary bombs may accomplish the destruction of magazines, oil tanks, concealed guns, etc.'

Yet when the RFC went to war in August 1914 it was, I would suggest, singularly ill-prepared to perform such duties. It clearly lacked the technical development to adequately perform these functions but, equally importantly, aircrew had been trained to do little more than fly 'straight and narrow'; in fact, 'training' probably isn't the word to describe what airmen did in the early years of the Corps.

The Air Service was open to any army officer who had the 'right qualities' – good eyesight, an aptitude for aeronautics and so on. The officer then had to take his ticket at his own expense at a private flying school. This would probably cost something in the region of £60-70 but could be reclaimed from the War Office. Thus the RFC was manned by pilots who could take off, circle the field and land. Further training was intended to be provided by a three month course at the Central Flying School. The first course commenced in August 1912 with 34 students and four machines; you don't have to be told the machines didn't last long and a major part of that first course involved the trainees waiting for machines to be repaired. The course taught map-reading, meteorology and basic mechanics, but flying training really involved little more than straight and level flying across country – which of course was all that was required on a reconnaissance flight. With the CFS course behind him, the airmen went to a squadron where further training was expected to be given. But somehow, the shortage of machines, rigid official attitudes about flying, extended leaves and social activities left very little time for flying training.

This inadequate preparation lasted at least throughout the first year of

the Great War. As late as spring 1916, Lieutenant (later Air Vice-Marshal) Vincent was sent to a scout squadron in France never having flown a single seater or 'done a turn over 45 degrees of bank; nor had he fired a gun in the air not had any lecture or instruction in air fighting.' Vincent was not an isolated case, for we find numerous other instances in memoirs of First World War pilots who were really incapable of performing any sort of manoeuvre which would enable them to avoid enemy fire or cope with difficulties. I mentioned earlier the rigid official attitude as to what constituted good flying. In the early days of the RFC, in fact, anything other than straight and level flight was positively discouraged; in September 1912, for example, Frederick Sykes, Commander of the Military Wing, told his officers 'show flying', by which he meant aerobatics, was merely 'cheap selfishness which would bring discredit on the Corps'; and this attitude was remarkably enduring in late 1915. We find Commander Samson advising his No 3 Wing, 'Don't try and do what is termed 'stunt flying'. This is not required for war, and is not the conduct required of an officer.'

However, he did add that it was good idea to look around now and then for German machines! Obviously, straight and level flying was exactly what was required for reconnaissance duties, but what were pilots to do if attacked by enemy machines or had to avoid anti-aircraft fire? To this failure to ensure that pilots could adequately control their machines, we can add that navigational instruction was minimal and gunnery and bombing training totally absent. Nor was any thought given to the possibility of stress caused by operational flying.

Given that reconnaissance was believed to be the primary role for the air service, surprisingly little was done to train observers. In the early days of aviation it was assumed that with the advantage of height, anyone could see all that a field commander would need to know of enemy deployment, terrain and so on. However, experience soon demonstrated that from the air, objects on the ground could be deceptive to the untrained eye. Sholto Douglas, for example, an experienced artillery officer, noted how, on his first flight as an observer in 1915, he was unable to recognise anything of military value. But by 1912, it was accepted within the RFC that training observers was essential. Captain Brooke-Popham, commander of No 3 Squadron, addressing the Staff College in autumn 1912 told his audience, 'It takes as long to train an observer as it does a pilot'; while Sykes informed the Royal Aeronautical Society two years later, 'Long training and much experience for observers is essential'. Even the Indian General

Staff submitted a paper to the War Office in 1913 urging the thorough training of air observers. Yet there was a vast difference between this rhetoric and what was actually happening at squadron level.

James McCudden, later one of the most distinguished combat pilots of the War, served from 1913 as a mechanic in Brooke-Popham's 3 Squadron. His autobiography reveals that he was frequently enlisted as an observer, as were other mechanics and fitters, and all without any training at all. Howard de Verd Leigh, a pilot during the first year of war, later recalled that it was a common belief at the time that 'anyone could be an observer'. The observer was apparently considered so unimportant that he was not even allowed a distinguishing badge until August 1915 and even when observation training was introduced, it was less than satisfactory, Major S Long, was trained for less than three weeks in 1915. His course included learning the Morse code, basic instruction on the Lewis gun and studying aerial photographs of the Western Front. Clearly, then, until at least 1915, and in some instances somewhat later, aircrew training failed to match the rhetoric and failed to prepare pilots and observers to carry out their stated objectives. So how can we explain these failures?

The explanation of the early air historians was that in 1914 war flying was an unknown quantity; that nothing was really understood about what would be required, and that war itself was the time of experimentation, of trial and error during which the techniques and requirements of air warfare were developed. While it is certainly true, that Britain had no direct experience of aerial warfare, there had been a number of accurate forecasts of what would be required in future air warfare and, more importantly, a great deal had been revealed by the first wars which had made use of aircraft.

From the middle of the nineteenth century there was an ever-increasing body of predictive literature – popular stories which explored the possible role of aeronautics in future warfare. This ranged through fantasies in which anarchists used giant balloons to bombard London, to the serious considerations of how air wars would be fought, as in H G Wells' classic *The War in the Air* published in 1908. The best of this fiction gave much thought to the nature of aerial warfare and suggested what skills should be developed in the airmen. In Claude Grahame-White's *The Air Kings Treasure,* published in 1913, for example, Alan King, the pilot-hero, well-understands the advantages of height, speed and manoeuvrability for success in aerial combat. Now, of course, it is easy to dismiss this fiction as sheer fantasy; pulp fiction not to be taken seriously. The best that might be

said for it was that it created a climate of 'air-madness' among the youth of 1914. However, it was less easy to dismiss the serious theoretical works written by engineers, scientists, pioneer airmen and military commentators when it reiterated exactly the same messages.

Those that attempted to predict the future conditions of aerial warfare included Hiram Maxim, inventor of the machine gun, F W Lanchester, Britain's foremost expert in aeronautical engineering, and Sir George Aston, a respected authority on military matters. All emphasised the need for thorough pilot training and all suggested that war flying would result in considerable stress on aircrew. As early as 1910, Colonel Capper, for example, one of the pioneers of military aviation, wrote to the War Office advising that as constant flying would take a toll on 'pilots' nerves', it was important to limit the hours flown. Clearly, then, well before 1914, there was a considerable body of theoretical literature which could have guided aircrew training programmes. But far more important than this literature was the experience of the first air wars – the Italian-Turkish War of 1911 and the Balkan Wars of 1912-13.

Robin Higham, the distinguished historian of air power, has claimed that few governments sent observers to these wars, and that may well be true. However, in Britain there was certainly no lack of intelligence and the War Office were particularly well-informed about the Italian air effort and the lessons derived from that experience. Not only were there detailed reports in the popular press and aeronautical and military journals, but also reports from military attachés and communiqués from the general staffs of the warring states. One Italian pilot who had flown operationally in North Africa was extensively interviewed by Brooke-Popham of the RFC and a detailed report sent to the War Office. Major Sykes was sent to Italy in 1912 specifically to gather information about air operations. All these sources provided a comprehensive picture of the implications of war flying.

I think we have to emphasise that Italian operations in North Africa were small scale – there was no aerial combat, and ground attack and bombing operations were minimal. Nevertheless, certain basic lessons about the nature of aerial warfare did clearly emerge. The first was that pilots required a high degree of training and had to be capable of manoeuvring out of danger. Turkish antiaircraft measures were primitive, but several Italian machines were damaged and the ability to take evasive action was essential. Secondly, operational flying – even straightforward reconnaissance patrols – put considerable strain on the pilot. The Italians found that three months duty was the maximum. Indeed, two pilots who

had flown eight missions had to be sent back to Italy to recuperate. Now this practical experience clearly confirmed what the theorists had been saying for the past few years. Yet, even during the first years of war, Flying Corps pilots were expected to fly combat missions with only the most rudimentary training, forbidden to practise the manoeuvres which might get them out of danger and fly two, three, and sometimes even more, patrols every day without any respite; and we might add in the far more hazardous skies over the Western Front. When they did crack, it was attributed to lack of moral fibre.

But there were other lessons that emerged from those first air wars. There was, for example, the emphasis that observers had to be highly-trained. The Italian General Staff found that information gathered by an untrained man was worthless, that accurate aerial observation required considerable practice and long training. Yet, as we have seen, although the RFC paid lip-service to this notion, nothing was actually done to train observers until well into the war years.

A further lesson, which the British might profitably have taken to heart, was that different kinds of machines were needed for different kinds of work. Operational experience had shown that one type of machine was incapable of performing all the duties that war flying would necessitate. And what was the reaction of the War Office? It was to standardise the BE2 as the 'maid of all work' for the RFC – a machine that was inherently stable and could virtually fly itself while the pilot busied himself with reconnaissance, photography or artillery spotting. After 1914, as the air war developed new directions, the BE2 had to take on the role of bomber and fighter and, needless to say, became a virtual death-trap. I might add that it was not until 1916 that HQ RFC began to recognise the need for machines designed for specific roles.

Why this body of theoretical knowledge and practical experience was never acted upon is not easy to explain and I think we can only take note of several factors which may contribute to an explanation.

Firstly, that despite the rhetoric of the RFC and the airmen themselves, the overriding belief of the War Office elite was that the RFC would do little more than gather information in what was generally thought would be a short and decisive war. Hence its pilots would only be required to fly straight and fly level (and this seems to be borne out by the belief that aeroplanes adopted by the Corps should be inherently stable – fly themselves in fact so that the pilot could concentrate on his aerial spying).

Secondly, the somewhat odd notion that flying was easy and akin to

riding a horse. Sefton Brancker, Deputy-Director of Military Aeronautics, told the Royal Aeronautical Society in 1917:

> 'There are few Englishmen who won't make good pilots so long as they have sufficient experience. Flying is perhaps easier than riding a horse because you sit in a comfortable armchair instead of a slippery saddle on a lively horse.'

Any gentlemen could ride, thus any gentlemen could fly with minimal instruction. A later dimension is the analogy of aerial fighting and sport – in which of course the Englishmen excelled. Aerial fighting was described as the 'the best sport of all' in one 1917 book on air warfare.

Thirdly, that training for observers was unnecessary – any trained soldier would know what to look for; hence any odd body – spare pilot, mechanic or artillery subaltern – would do.

Finally, that perhaps there is more truth than has been credited to Sir Walter Raleigh's assertion that the British are a 'practical people and distrust theory.' Perhaps those charged with preparing the air service for war really did have to learn through their own practical experience?

But to ignore theory and the experience of other nations was a costly and tragic error.

What I have attempted to do in this brief paper is to suggest that the early years of the RFC were marked by a serious failure to prepare personnel to carry out the stated objectives of the Corps. I hope we might be able to pursue this further in the discussion. What interests me is whether we can isolate other instances in RAF history where training failed to provide aircrew with the abilities to carry out stated doctrine? Were there other periods where theory and the experience of other nations was ignored in our own training programmes? I think perhaps there were. But that's a debate which can perhaps be taken up in the discussion.

In view of the illuminating comments made to me by a number of members after the presentation of the above paper and whilst I still hold that the RFC was unprepared to perform its stated wartime role in 1914, I think that perhaps I dealt a little harshly with some aspects of the RFC's flying training programme.

THE CFS AND FLYING TRAINING 1915-1935

John W R Taylor

The aeroplane was ten years old when World War I began. Much had happened since Orville and Wilbur Wright had made their first powered flights in the USA on 17 December 1903; but the basic configuration of their front-elevator stick-and-string biplane was still evident in many aeroplanes of 1914.

Maurice Farman S.7 Longhorns were standard equipment at the Central Flying School at Upavon, Wiltshire, which had been doing its best to train pilots for both the Military and Naval Wings of the newly-formed Royal Flying Corps since 17 August 1912. The Royal Aircraft Factory, at Farnborough, contributed BE2a tractor biplanes. The young Geoffrey de Havilland had played a major part in the BE's design; it was easy to fly, stronger than was necessary in those days, and had a top speed of 70 mph.

As Dr Paris has explained, the Royal Flying Corps was hooked on stability. The idea was that the aeroplane should be capable of keeping itself straight and level. The pilot could then devote his flying time to reconnaissance of the scene below, and even draw maps to indicate anything of interest to the Army and Navy. In this respect, the BE2a was less than perfect, being controlled by wing-warping. This was simple, but less positive than aileron control.

The supposed deficiency was remedied in the BE2c, by fitting new wings with 3½ degrees of dihedral, a marked stagger, and ailerons instead of wing warping. Here was a truly stable aeroplane, which was fine until front-line BE2cs encountered German Fokker monoplanes over the Western Front in France, with synchronised front machine-guns. Lacking agility, the BE2cs were shot from the sky in what became known as the 'Fokker Scourge' of 1915-16.

In truth, the flying training methods of the time were partly to blame for the RFC's plight. The intention in 1912 had been to give all pilots a standardised flying training, of the highest quality, at the Central Flying School. This never happened. Ninety-three of the 153 pilots who completed their ab initio training with the RFC prior to World War I did so at Upavon. The CFS then lost virtually all of its airworthy aeroplanes and instructors when the RFC flew to France.

As the air service began to prove its worth, at rapidly increasing cost in casualties, it became essential to expand the training system to cope with increasing demands. By the end of 1914, the policy was for all pupils to do

their ab initio flying at one of the reserve squadrons that had been formed at Farnborough, Brooklands and Shoreham. As soon as they had qualified, they passed on to the CFS or a service squadron for advanced training.

Most of those who completed a course at Upavon were absorbed in replacing casualties overseas, and soon the service squadrons were also having to produce a quota of pilots for the Expeditionary Force. Even this could not keep pace with demands from France, and in January 1915 each squadron at home was ordered to give a complete course of instruction to sufficient men to create one new service squadron. Finally, the reserve squadrons also were allowed to give advanced training.

By the end of 1915, the training organisation in Britain comprised no fewer than eighteen reserve squadrons and eight service squadrons engaged on flying training, in addition to the CFS.

It was no longer adequate simply to teach pilots to fly. The War Office established a Machine-Gun School (later No 1 School of Aerial Gunnery) at Hythe in September 1915, and a School of Wireless (later, successively, the Wireless and Observers' School, and then the Artillery and Infantry Co-operation School) at Brooklands. They were followed, in December of the same year, by No 1 School of Military Aeronautics at Reading, with the aim of training officers transferred from the Army to fill vacancies in primary training squadrons.

The reason for forming so many new stations was that it was considered impracticable to train more than sixty pupils at a time on any one aerodrome. This was wasteful in demanding a large number of instructors. On the other hand, bad weather did not necessarily ground aircraft at all the widely dispersed stations, which also provided a valuable network of landing fields countrywide.

It was all rather grand, but the results did not impress the commanding officer of No 60 Squadron in France. Major Robert Smith-Barry had been a member of the first training course at the CFS in 1912. He was probably the most polished pilot to pass through the school in its early years, albeit with a unique mixture of wildness and brilliance.

Smith-Barry was appalled by the mental attitude of new RFC pilots. In a letter to the authorities in England, he commented: 'The writer has been surprised to notice how little interest in flying is taken by many young pilots who come out to the Front. Though very young, and quite fresh, they have to be ordered to go up from the very first; they never ask permission to go up even for a practice flight. Before the war young fliers were always begging to be allowed up. It is thought that this, though in part due to the

difference between voluntary and impressed labour, is largely due to the mental supineness of instructors in England.'

He said that flying instruction was left to those who were resting, those who were preparing to go overseas, and those who had shown themselves useless for anything else, adding: 'They had not even the stimulus of knowing that their results were watched and compared. They were never blamed or praised. No scheme was laid down for them and no instructions were given them, and they therefore looked upon their work as the merest drudgery. The only check on the proficiency of their pupils, apart from a weekly report, was furnished by the time the latter had passed in the air. Pupils were therefore occasionally sent up and told to fly around an aerodrome continuously for several hours without landing.'

The key suggestion came in the postscript to a letter written on 21 November 1916, in which Smith-Barry said: 'On second thoughts it appears to the writer that the best way to make use of the above principles would be to start a school for turning out Instructors in Flying, with the idea of all Instructors eventually going through it.'

Other letters followed. In one of them he emphasised the importance of dual controls, so that pupils could take charge of the aircraft gradually, could go up with an instructor safely in almost any kind of weather, and could be shown that steep turns, high rates of climb and even spins were not fatal.

By good fortune, if you believe in that kind of thing, the commander of the Training Division in England at that time was General John Salmond. He just happened to have been an instructor at the CFS during Smith-Barry's training at Upavon. Knowing his reputation, Salmond had no hesitation in bringing him back to the UK late in 1916, to take over No 1 Reserve Squadron, then at Gosport, and try out his unorthodox ideas.

In a first move that was to change the face of flying training for ever, Smith-Barry got rid of as many of Gosport's obsolete aircraft as possible, and built up his school on a foundation of dual-control Avro 504Js. Up to that period, pupils graduated on to the Avros, with their 100 hp Gnome Monosoupape engine, only after completing several hours on Farmans. Smith-Barry was interested only in teaching men to fly combat aeroplanes. He knew from experience as an instructor that the Mono-Avro's controls were light and powerful, that it could perform safely all the aerobatic manoeuvres then known, and that it would teach pupils from Day One to become familiar with, and use to advantage, the torque effect produced by a comparatively large, rapid-turning, rotary engine.

The Avro's narrow wheel track forced them to learn quickly not to swing or drop a wing during take-off. Engine-on forced landings were practised – and everything was always done with the confident knowledge that there was a first-class instructor in the front cockpit. They needed to be first class, and Smith-Barry was given the choice of the best pilots in France. They were instructed never to keep pupils hanging about. Flight Commanders with dual-control aircraft were made personally responsible for all smashes that took place in their flight. Because 'the mere capacity to leave the ground and land in safety does not qualify a pilot for scout or artillery work', pupils were to be shown how to take off in a cross-wind, stall, make very sharp turns, and fly with confidence in any weather always with the instructor in the front, passenger, seat.

Instead of relying on the time-honoured communication between pupil and instructor by stick-wagging and hand signals, Gosport pilots learned to stall their aircraft and exchange a few quick words during the subsequent few seconds of quiet. This soon gave way to what became known as the 'Gosport tube', a one-way 'telephone' system, consisting of a pliable tube with a pair of ear-pieces for the pupil at one end and a funnel-shape mouth-piece at the other end. With this, the instructor could ensure that his pupil knew exactly what was happening or about to happen.

The first batch of pupils subjected to the new training system were simply the next sixteen on the training list, and not specially chosen in any way. They were expected to spend about 12 hours dual and about 18 hours solo in the Avro 504J Flight, then a spell in the Blériot Monoplane Flight, and finally a few hours in either the Bristol Scout or Morane Flight, depending on whether they were to be posted to a scout (fighter) or reconnaissance unit on active service.

It must be clear from my frequent references to Farmans, Blériots and Moranes how much the Royal Flying Corps depended on the French aircraft industry to meet its equipment needs in the early years of World War I. Britain's attempts to concentrate aeroplane design at the Royal Aircraft Factory, with private companies contracted only to manufacture the results, had never worked. from the start the Admiralty had bought aircraft for the Naval Wing, soon renamed the Royal Naval Air Service, from the Sopwith and Short companies. The RFC had begun to recognise the capabilities of Avro from the moment the CFS received its first two Avro 500 trainers, in time for its No 1 training course. they became favourites with Lieutenant (later Group Captain) C R J Randall, who was largely responsible for keeping the School's aircraft serviceable, and he

was unable to recall a single injury to a pilot flying a 500.

The 504 was a development of the 500 configuration, with the, same central skid on its undercarriage, which was almost incapable of being smashed. It put the little Avro company on its feet, and was to remain the standard primary trainer of the RFC and Royal Air Force through most of the period covered by my talk. Production in 1914-18 alone totalled 8,340 504s of various kinds, and that was only the start of the story.

This, then, was the key to Gosport's success in 1917, and a success it certainly was! When official inspectors came to check on the progress of those first sixteen pupils, they saw them flying in formation, and doing aerobatics and landings never dreamed of by trainees elsewhere. Thirteen of them were finally sent off solo in the latest types of aircraft in front-line service in France. They looped, spun, and landed with considerable skill. It marked the turning point in flying training – not just in Britain, but eventually worldwide. All flying schools in the UK, and in British Dominions and Colonies overseas, were instructed to adopt Smith-Barry's methods at once. More important still, Gosport was transformed into the Instructors' School for which Smith-Barry had campaigned so strongly, under the name of the School of Special Flying (SSF).

Many of the battle-experienced pilots sent to the SSF complained bitterly when posted. They knew it all. They had shot down enemy planes, and knew far more about flying than the so-and-sos in England. By the time they left Gosport three or four weeks later, they wondered how they had managed to live so long in their ignorance of real flying.

Smith-Barry produced a booklet entitled *Notes on Teaching Flying,* I am sure you will forgive me if I quote four paragraphs of this in his own words. They reflect the man, and much would be lost if anyone attempted to précis them. After reiterating the necessity for dual controls, he continued:

> 'The next and most important thing is that quite half the dual control that is given (*at the SSF*) is administered after the pupil has gone off alone, as unless the learner has practised doing a given thing, such as turning, a good deal, he will not appreciate the details that are shown him. In this way, bad habits are corrected before they have had time to get fixed.
>
> 'The next thing is that, as far as possible, advanced pupils have been allowed to fly exactly as they chose, their experiments being limited only by the state of their own nerve. This has not been found to increase the number of casualties.

'The instructors have been teaching always from the passenger's seat, so that the pupil has not had to experience an embarrassing change of seat either just before his first solo or at any other time. In this way, the instructor has, of course, been deprived of instruments, but I take it that a flyer who could not do without instruments would have more to learn than to teach.

'The object has been not to prevent flyers from getting into difficulties or dangers, but to show them how to get out of them satisfactorily, and having done so, to make them go and repeat the process alone. If the pupil considers this dangerous, let him find some other employment, as whatever risks he is asked to run here, he will have to run a hundred times as many when he gets to France. How can a young officer be expected to do very much in France if, during the whole of his training in England, he has been told of nothing but what it is considered dangerous to do in flying? As most of the supposed dangers are not dangerous at all when properly tackled, it would seem a simple matter for the pupil to be taught, chiefly by example, to be frightened of nothing connected with flying on this side of the lines.'

People who ventured near to the SSF in any sort of vehicle ran the risk of being buzzed by the pilot of a 504J, at, very literally, sea level, before the aircraft disappeared over the hedge in a side-slip, sat down in a field more suited to village cricket, and then took off again without stopping the engine. It gave the appearance of an aerial lunatic asylum but, like its founder, was simply logical in an entirely orthodox way. The exuberance of its occupants was improved by sending to Gosport examples of front-line fighters such as the Pup, Camel and Bristol Fighter.

In 1918, all instructors at flying training schools of the newly formed Royal Air Force were given a small booklet of just 50 pages. Entitled *Flying Instruction,* it was probably the first booklet ever to set out a complete training course, and was sheer unadulterated Smith-Barry. A few months later, World War I came to an end. It was considered 'the war to end all wars' and, soon afterwards, it was announced in the House of Commons that 'the flying training of all pupil pilots has been discontinued in the interests of public economy.' This was the height of stupidity. Fortunately, the RAF had passed into the hands of a Chief of the Air Staff who had more sense.

Major-General Sir Hugh Trenchard – remembered today as Marshal of the Royal Air Force Lord Trenchard – had been Assistant Commandant of

the CFS before the war. He had very definite ideas on the importance of sound flying training, and was determined that the new service would not squander the pioneer achievements of the CFS and School of Special Flying.

In December 1919, anyone so inclined could buy for one penny, from the Paper Stationery Office, a copy of *Command 467, Permanent Organisation of the Royal Air Force – Note by the Secretary of State for* Air *on a Scheme Outlined by the Chief of the Air Staff.* The Secretary of State was Winston Churchill, but Cmd 467 will always be remembered as 'Trenchard's White Paper'. Key paragraphs were headed 'Extreme Importance of Training'. They began with the unambiguous statement that:

> 'We now come to that on which the whole future of the Royal Air Force depends, namely the training of its officers and men. The present need is not, under existing conditions, the creation of the full number of Squadrons we may eventually require to meet strategical needs, but it is first and foremost the making of a sound framework on which to build a service, which while giving us now the few essential service Squadrons, adequately trained and equipped, will be capable of producing whatever time may show to be necessary in future.'

He continued that: 'Firstly, to make an Air Force worthy of the name, we must create an Air Force spirit ... by every means in our power.' He rejected out of hand the suggestion that cadets and staff officers should be trained by the Army and Navy. Instead, he said that the channels of entry for permanently commissioned officers would be through the Cadet College that was to be opened at Cranwell in the following year. There, cadets would receive full ground and flying training, needing only a subsequent short course in air pilotage and practical cross-country flying at Andover, and a course in gunnery, to fit them for Squadron service.

So, Cranwell was to take over what had been the original functions of the Central Flying School; but nothing was lost. Trenchard's next proposal stated: 'One other most important school in connection with the training of the officers is essential, and it will probably be necessary to start it on a small scale in 1920. This is a school for flying instructors. The first school of this kind was started at Gosport during the war, and it is hardly too much to say that it revolutionised the art of flying.'

I need hardly add that the CFS was chosen for this vital part of the great plan. As it all took shape, Trenchard commented: 'I have laid the foundations for a castle; if nobody builds anything bigger than a cottage on

them, it will at least be a very good cottage.'

After its wartime role as an ordinary flying training school, producing an average 50 pilots each month for single-seat fighter squadrons, the CFS went back into business on a grand scale at Upavon in March 1920. Today, it is the oldest establishment in the Royal Air Force still in business under its original name; but every detail of its history, and its present activities, belie its eighty years.

There was no possibility that the carefree, yet deadly serious, atmosphere of the School of Special Flying would disappear when instructors at the CFS in the twenties included men like Flying Officer D'Arcy Greig, remembered variously as a pilot whose wing-walking antics terrified pupils from the nearby No 1 FTS at Netheravon who witnessed them during training, but who was also a distinguished member of Britain's Schneider Trophy seaplane team, and a superb Chief Flying Instructor.

CFS pilots like 'Batchy' Atcherley, a subsequent CinC of Flying Training Command, and Dermot Boyle, later Chief of the Air Staff, flew as members of aerobatic teams from CFS that thrilled visitors to the annual RAF Pageants at Hendon. Pilot Officer Frank Whittle, who completed an instructor's course in 1929, is remembered better as the pioneer of the modern jet engine than as one of the CFS pilots who demonstrated 'crazy flying' that was anything but crazy, and called for the same skills that are shown by today's Red Arrows in their crossover manoeuvres.

There could be no better testimony to the quality of RAF training than that The King allowed his Number Two son, Prince Albert (later King George VI) to gain his 'wings' on a 504J.

Even the 504 had some little tricks. For example, the Gnome rotaries fitted in Js and some Ks had a habit of shedding cylinders. One flung a 'pot' through the upper wing at the precise moment in 1925 when Flying Officer D'Arcy Greig said to a pupil, 'Always remember when flying near the ground to keep sufficient speed in hand to permit a 45 degree turn in either direction with the engine off'. He was given an immediate opportunity to demonstrate why!

The CFS moved to Wittering in 1926. Its equipment at that time totalled 21 aircraft, made up of 12 of the new Lynx radial-engined Avro 504Ns in the Pupil Instructors' Squadron and a Service Flight of four Bristol Fighters and five Sopwith Snipes. The next decade saw far more significant changes. Structures became all-metal, with fabric covering. The Schneider Trophy seaplanes of Supermarine foreshadowed the clean metal monoplanes of the mid-1930s, the Hurricane, Spitfire, Battle and others

that would have retractable undercarriage, enclosed cockpits, flaps, closely cowled in-line engines, blind flying panels, and radio.

The flying training programme did not lag behind. Between 20 October 1930 and the end of 1933, the CFS trained 329 pilots in the new technique of instrument flying, and the RAF began to cease being a fine-weather air force. For this purpose, Lynx-Avros were fitted with a hood that could be pulled over the rear cockpit. At the same time, the instructor could pull strings to cover with blanking plates the ASI and compass in the rear cockpit. After that, the pupil had no outside reference and had to keep straight and level with the aid of altimeter, turn indicator and fore-and-aft level.

To build up the confidence of nervous newcomers, Flt Lt Pat Johnson, commanding the instrument flying 'E' Flight, had a little party trick. It consisted of a solo flight in which he took off under the hood, climbed in an orbit, went through a couple of aerobatic manoeuvres, including a spin, and then glided down to 200 ft, opened the hood, and landed without using his engine. He became so expert at this that, although 'blind', he was able to position himself where the onlookers could see the hood opening before he landed, to show that there was no cheating. His subsequent Air Force Cross was never more deserved.

Bulldogs, Harts, Siskins and other front-line types joined the Lynx Avros at Wittering in the early 1930s. At last, in 1932, the old 504s began giving way to Avros of a later, all-metal generation – the Tutors. By the time the CFS moved back to Upavon in the summer of 1935, Britain had realised the urgent need to begin matching the formidable strength of Hitler's newly-revealed *Luftwaffe*. Thanks to the efficiency of the training programme of the 1920s and '30s, it was possible to build a castle on the foundations laid by Trenchard, just in time for the crucial battle of August/September 1940.

WG CDR ALLEN AND FIRST WAR FLYING TRAINING IN NORTH AMERICA 1917-18

Gp Capt H Neubroch

'An inborne sense of leadership, a readiness to take command and assume responsibility, coupled with an independence of outlook' – Wg Cdr D L Allen, describing the qualities of those regular army officers who in 1914 formed the backbone of the Royal Flying Corps.

Wing Commander Dermott Lang Allen saw service in the British Army and the Royal Air Force, though not continuously, in each of the first five decades of this century. His service encompassed an extraordinary flying career before, during and after World War I, culminating in one particular and barely known chapter covering the years 1917 and 1918, when he played a key role in what became known as RFC Canada: the organisation set up in Ontario in early 1917 which was soon to spread to the United States, and was to train more than 4,000 pilots and some 137 observers – sowing, in the process, the seeds of both the United States Air Service and the Royal Canadian Air Force.

Wing Commander Allen died in 1971. At that time Brigadier Mike Silberrad, who is married to Allen's daughter Noreen, worked with the author at SEATO HQ in Bangkok. Noreen mentioned that her father had been a -founder member of the Royal Air Force, but forbore to say that he had also been an early member of the Royal Flying Corps. It was not until 1991 that she passed on her father's private papers[1] – all 199 pages of typescript.

It proved absorbing reading. In his young days Allen travelled widely; when still a regimental soldier, he read all he could on the art of war, and commented freely on the great events through which he was living. He had an eye for the telling detail, especially in matters of national customs, pageantry, social nuance and service etiquette; nor did his Victorian upbringing preclude a keen enjoyment of the foibles of some who later figured prominently in the history of the air service. And there was of course his expertise in all aspects of early military aviation, which he saw developing almost from its infancy. This narrative draws on his

[1] Versions of the Allen papers are held at the Imperial War Museum, the RAF Museum and the Directorate of History, National Defence Headquarters, Ottawa, who have kindly checked their factual accuracy as regards RFC Canada. Some of the material may have been published in *Blackwoods*, and possibly the magazine of his old regiment, the Royal Irish Fusiliers.

recollections of events in which he played an important part; wherever possible his own words have been used.

Picture then a slim upright figure just under six foot tall, with ash blond hair and piercing blue eyes. A slight stammer which plagued him from childhood belies trenchantly expressed views: the Irish temper is never far below the surface. Subordinates know him as strict though often given to great kindness, superior officers consider him unconventional, prickly, his judgement sometimes erratic, but with imagination and initiative aplenty.

Background and Education

Dermott Allen was born in India on 14 July 1890, a younger son of a successful Anglo-Irish barrister at the Calcutta bar. his parents held unconventional views on education, believing that a knowledge of French and German would place the world at a young man's feet, particularly in a business career; and so, after early days at Cork Grammar School, Allen was sent to a Swiss school near Neuchatel and thence to crammers in Hanover, however, a schoolboy prank on his last day in Neuchatel, which landed the young Dermott in jail, persuaded his father of his unfitness for commerce – hence he must go into the Army.

Pre-War Soldiering and First Flights

Accordingly he spent 1909 at the Royal Military College Sandhurst, and the following year was commissioned into the Royal Irish Fusiliers, posted to Aldershot and paid 5/3d per day. He noted that in that year's manoeuvres air participation was cancelled owing to Capt Dixon's experiencing engine trouble with his monoplane. There were no manoeuvres in 1911 but the first appearance of the RFC in the 1912 manoeuvres made a deep impression.

Meanwhile Allen had played his full part not only in the social life of Aldershot but in Irish and French society, where his family were well connected. He took his military duties seriously but soon became dissatisfied with regimental soldiering. Accordingly he applied to join the newly-formed Royal Flying Corps, but nearly fell at the first hurdle: the International Flying Brevet was a requirement for acceptance to the about-to-be formed Central Flying School, and he could not afford flying lessons. However, he persuaded his father to cough up the necessary £75 for the Grahame White Flying School.

And so it was that at 5 am one June morning in 1912 Allen reported to Hendon, in company with Captain John Salmond of the King's Own Lancaster Regiment. He remembers:

'The method of instruction was as primitive as the aircraft. Instruction ceased when the windspeed rose above 7 mph, or when the sun warmed up the atmosphere. There was only one training aircraft for 10 or 12 pupils, and this was frequently unserviceable; furthermore, it could not be turned to the right without stalling. At length I took my test on an aircraft I had piloted for only ten minutes the previous evening. I had to perform a solo take off, two figures-of-eight not below 300 ft; and then, with engine stopped, the aircraft had to be landed without breakage within 80 ft of the official observers.'

Armed with his Aviator's Certificate dated 15 October 1912, No 31-in the British Register, Allen next reported for No 1 Course at the Central Flying School at Upavon, and immediately crossed swords with the Staff Officer, one Major Trenchard. The trivial incident causing the rift resulted in a lifetime of mutual antipathy – not a good omen for Allen's future in the flying service. These are Allen's recollections of the course:

'Ground training included practical work on engines and aircraft. Pupils flew alone, putting in as much time as aircraft availability and weather permitted, usually during two hours after dawn and two hours before dusk. As they gained experience in bumpy conditions, they were allowed to fly at any time of day; there was no night flying. As soon as we showed sufficient proficiency, we were sent on cross-country flights. By the end of the course we would have done about 15 hours. The course ended with the usual examinations – one officer failed. I was awarded Graduation Certificate No 36.'

On 12 January 1913 Allen was seconded to the Royal Flying Corps and posted to No 3 Squadron at Larkhill, commanded by Major Brooke-Popham (Henri Farmans and BE2s). The squadron took part in that year's army exercises, and spent the autumn devising air armaments.

Early War Years

Of Allen's early war experiences there is only scope to mention some highlights. Before the outbreak of war Allen, as senior flying officer, had been appointed Squadron Adjutant, but when Maj John Salmond, acting very much as the new broom, took command, Allen was deprived both of his appointment and his aircraft. Thus, when the squadron moved to France as part of the British Expeditionary Force, he was put in charge of the ground party which crossed by sea.

On arrival at Maubeuge, where the whole air strength of the BEF had

been concentrated, he was detailed to fly as Lt Philip Joubert de la Ferté's observer. On 22 August they flew their first war patrol and alerted GHQ to the French retreat – but were not believed. During the retreat from Mons Allen was attached to the staff, put in charge of stragglers, and reconnoitred for landing grounds, but in September there followed more patrols, and he was wounded in a crash.

By the time he had recovered, in early 1915, he was posted as flying instructor and adjutant to Brooklands. Posted back to France, he acted as equipment and photographic officer at the St Omer Aircraft Park, before returning to squadron service as a reconnaissance pilot with No 7 Squadron, commanded by Maj C G Hoare of the Central India Horse, one of the first Indian Army officers to be sent to CFS; he will figure later in this account.

In August 1915 Allen was promoted captain and appointed Flight Commander on No 8 Squadron (BE2cs), and at year's end invalided to England. Nine months later he formed No 26 Reserve (ie Elementary Training) Squadron at Turnhouse, a field which he had himself chosen for that purpose; he was promoted major in June 1916.

On 1 January 1917 Allen was one among half a dozen or so officers to report to Brigadier General Sefton Brancker at the War Office. Brancker had been left behind when the RFC moved to France in 1914, to organise the Corps' wartime expansion. Allen was about to enter the most productive phase of his service.

RFC Expansion

In August 1914 Lieutenant Colonel Sefton Brancker devised plans to develop the RFC from six to fifty squadrons; Kitchener doubled this target at the stroke of his pen. Brancker foresaw an eventual manpower shortage in the UK and had the inspiration to seek pilot material in Australia and Canada. As regards Canada, a plan had been evolved by the end of 1916, whereby the UK was to supply money, know-how, a nucleus of trained personnel, and procure such equipment as could be produced in North America. Canada was to give goodwill and manpower, coupled with the resources of the Canadian Department of Militia and Defence, and make available her industrial resources. The whole cost was to fall on the UK and the organisation was to be responsible directly to the Governor General – not the Canadian Government. The Imperial Munitions Board was directed to arrange for the manufacture of the Curtiss JN-4, the engines to be obtained from the Curtiss plant in the USA, and to meet all the requirements of the RFC in the way of land, buildings, equipment and

services.

On New Year's Day 1917 Brancker outlined this scheme to Lt Col C G Hoare (Allen's former Squadron Commander on 7 Squadron, and a former Assistant Commandant at CFS) and a small group of officers. 'You will sail for Canada within a week. You will form a pilot training organisation of twenty squadrons. The Canadian Government will help you. The Imperial Munitions Board will arrange supply of aircraft, aero engines, equipment, land and buildings. You can have a million sterling as a start – ask for more when you want it.'

To the question, 'Where in Canada shall we go to in the first instance?', Brancker replied, 'That is up to you' – and they were dismissed.

On board ship the party developed plans to build 'RFC Canada' into an organisation capable of giving flying training to suitable manpower available in Canada, and a timetable which was adhered to with remarkable accuracy, save for the major upheaval caused by the entry of the United States into the war.

RFC Canada

By the end of January, HQ offices had been acquired in Toronto, accommodation arranged and a Recruits Depot established; applicants were being enlisted and trade tested. Soon, a School of Military Aeronautics was formed at Toronto University, which was eventually expanded to give ground instruction to some 1,200 cadets. Accommodation was made freely available by Vincent Massey[2] at a well-equipped Hall of Residence.

The elder Hoare had been promoted brigadier general and authorised to grant or cancel temporary commissions in the RFC Special Reserve and enlist, discharge, promote or reduce in rank every category of other rank. He had, moreover, been granted what amounted to full financial powers through the medium of the Imperial Munitions Board. Under his command HQ RFC Canada in Toronto soon controlled some 15,000 personnel, including 1,300 women. The supply organisation was controlled by the general's brother, Lt Col F R G (Gurney) Hoare of the Ordnance Corps, and a mere two staff officers. As SO 1 Air Allen, promoted lieutenant-colonel in July, was effectively Chief-of-Staff to Gen Hoare.

Col Hoare's Equipment Branch worked closely with the Aviation Department of the Imperial Munitions Board, who procured all equipment – ranging from aircraft to boots – some 10,000 headings in the stores

[2] Shortly to be appointed Canada's first Ambassador ever (to Washington); later High Commissioner in London, and eventually Governor General of Canada.

vocabulary; it was also responsible for lands and airfields to RE specifications; the sappers were responsible for maintenance. As a further indication of the growth of the organisation, the Commissariat soon served some 40,000 meals per week.

Most importantly, construction of a complete flying training station was put in hand on some 1,000 acres of land near the Canadian Military Camp at Borden, 50 miles north-west of Toronto. Seven hundred men, mostly enemy aliens, and two hundred teams of horses were put to work by day and night in the most rigorous conditions, often 20 and 30°F below zero, to such effect that by April the camp was in occupation and ready for flying training.

When completed, the camp had accommodation for 122 officers, 500 cadets, 1,100 other ranks, some 150 aircraft – and all the ancillary services needed for a wing of six squadrons. As accommodation became available, units were formed around newly arrived UK 'cadres', each usually consisting of two officers with flying experience from France and half-a-dozen NCOs and men from skilled trades, and reinforced with officers and enlisted men from Canada.

Meanwhile the British Government-financed Canadian Aeroplanes Ltd had started producing the Curtiss JN-4 biplane, with the first two aircraft handed over in February (!) at a flying strip (Long Branch) near Toronto: peremptorily Hoare insisted that flying training begin forthwith, and the first solo flights took place on 16 March. The following month, when RFC Camp Borden opened, 40 aircraft were delivered, and by April 1918 monthly output reached 350.

Col Hoare was soon prospecting for additional airfield sites near Toronto (eg, Deseronto, 130 miles to the east), and had selected two sites near Vancouver, in anticipation of the coming winter, where much milder winter weather could be expected. But these plans were suddenly and dramatically changed by the United States' entry into the war on 6 April 1917.

US Enters War

Allen quotes Gen Hoare's own summary of events as follows:

1. A wire from Governor General in Ottawa saying US had asked for RFC officer to come and advise them (presumably on flying training). He asked if I would go. I agreed.
2. I cabled the War Office asking if any instructions. They replied, 'Do not commit yourself.'
3. Went to Washington and outlined my ideas to Hiram Bingham (a

Harvard professor given the rank of colonel and made responsible for ground training of army pilots) whilst lunching with him at Raleigh Hotel.

4. After lunch went to a large conference with (Gen) Squier (Chief Signals Officer, US Army) in the chair and gave them a fairly complete summary of my proposals off the cuff. Squier then said, 'We agree.'

5. Returned to Toronto to put scheme in writing and it was definitely settled without reference to War Office.

6. I expect I sent a copy home, but no recollection of any sanction. Washington confirmed the agreement 'in toto'.

Returning the visit, Gen Squier conferred with Col Hoare and Allen in Toronto. He came right to the point:

'Colonel, we have some 140 millions of population, a vast industrial potential, unlimited money. We want to do something big in aviation. How shall we set about it?'

Hoare lit his pipe with deliberation and replied:

'Well, General, I would suggest you design an aero engine of not less than 100 hp, produce it in mass and build your various types of aircraft around it. All the rest will fall into place.'

That was the conception of the famous Liberty engine, produced by the thousand.

Squier, Hoare and Allen then reviewed the arrangements agreed after the Washington meeting. The RFC was to contribute all the know-how at its disposal, and to train from scratch the ground and flying personnel for ten air squadrons. In return, the Americans would provide, during the coming winter, fully-equipped aerodromes in Texas, together with aircraft, engines, spares and all ancillaries needed to train both American and RFC personnel. They would purchase the aircraft from Canadian Aeroplanes Ltd. The enlistment of British personnel in the USA would be permitted. The whole scheme would be under British control, and the US would foot the bill. For the British, no more favourable agreement could have been imagined.

An exchange of letters between Gen Squier and Lt Col Hoare confirmed these arrangements, but there was no legal instrument validating the 'Reciprocal Agreement', as it become known. It was accepted that implementation must depend upon mutual trust and a determination to make the agreement work. Allen says: 'It did.'

An RFC recruiting office opened on Fifth Avenue, New York, and applicants for pilot training queued by the hundreds. It was remarkable how many of them had 'mislaid' their Canadian passports. Matters came to a head when one of the Roosevelt family tried to enlist, giving the former President as a reference. Fortunately the recruiting officer brought the matter to Gen Hoare's notice, who at once wrote to the Great Man. Col Roosevelt, writing in his own hand, warmly thanked Hoare for his action and agreed that it would be impolitic for a relation of his to join the RFC while the US Army Air Service was in process of development. The State Department, not unreasonably, suggested that definite proof of British citizenship should be required before enlistment.

Soon troop trains carrying regular US drafts arrived at the Recruits Depot in Toronto, where they were processed before being moved on a fortnight later to Camp Borden.

The Social Round

There is a great deal in the Allen papers about the domestic arrangements for the HQ staff in Toronto. There was a visit by the Governor General, the Duke of Devonshire, and the three senior RFC officers were entertained in Government House, Toronto, and by the cream of Canadian, and after April 1917, American society. Allen's appreciation of their generous hospitality will be warmly echoed by those who had similar experiences some 25 years later.

RFC Fort Worth

By June Allen was touring Texas looking for suitable aerodrome sites. He selected three excellent ones around Fort Worth, and by September the three aerodromes, constructed to War Department pattern, to accommodate some 120-150 aircraft and up to 2,000 personnel, were ready to receive the RFC advance party. In October, RFC Advanced HQ, Fort Worth, under the command of Lt Col Allen, came into being.

Problems and Difficulties

All appeared ready to start flying training, with the exception of the all-important motor transport which the Americans had failed to provide on time. In an episode stretching Anglo-American relations to the limit, Allen purloined, without authority, a trainload of motor chassis, the property of the US War Department, and arranged for the local manufacture of wooden bodies. Allen described the atmosphere at the subsequent conference as 'tense and aggressively inimical to the British.' Almost miraculously, Allen's bacon was saved by the newly arrived US Adjutant – a fellow

Irishman who, in a previous incarnation, had been Allen's brother's QMS in India!

Another, possibly more serious, incident arose some weeks later when a 'northern', that is a northern storm, caused the temperature to drop suddenly from 75 to 34°F. The American servicemen lacked suitable clothing and went down like flies. The US medical authorities gave priority in the allocation of hospital beds to their own men even over RFC crash casualties, who were of course mainly Canadians. This time it was US-Canadian relations that were at risk and, as ever, the press stood ready to exacerbate matters bearing on national sovereignty.

There had already been friction with the Toronto press intent on stories of flying accidents, suspected scandals and administrative blunders, and anxious to spread the image of callous British officers, indifferent to the lives of gallant young Canadians. Not until mid-1918 was a gifted young Canadian lawyer, Maj M A Seymour, appointed Press Liaison Officer, when relations improved.

Meanwhile Allen's task of driving the implementation of the Reciprocal Agreement forward was not eased by the happy-go-lucky Texan temperament and a somewhat different historical perspective. 'The war' meant the American Civil War – the little local difficulty across the water was referred to as 'the war in Europe', and was not always accorded the priority which Allen wished.

Nor were the RFC staff entirely blameless when it came to diplomatic or ceremonial gaffes. Because the Canadian Government was not in the chain of command, no one thought to inform them of the Reciprocal Agreement, and so the first US troops entered Canada without formal Canadian authority: it took the Governor General's personal intervention to smooth ruffled feathers. At a lower level, when Maj Arnold (later General of the Army) on a visit to the Recruits Depot in Toronto saw a squadron of doughboys doing a fair imitation of the Slow March under an ex-Brigade of Guards drill instructor, his rage was apoplectic. Invariably such problems were resolved in a spirit of goodwill.

Flying Training

A brief note about the nuts and bolts of flying training. The UK cadre system has already been mentioned, but it was soon found that recently qualified pupils made better instructors than former front line pilots, who tended to become easily bored by the repetitive nature of basic training. At the outset accidents caused a 5% fatality rate of all pilots under training – one cadet was killed for every 1,800 hours flown; and though these

statistics were not published, there was considerable public unease at the number of flying accidents in Canada.

Major improvements were brought about by the appearance of a War Office pamphlet on the Gosport System, which outlined a training sequence from effect of controls to advanced aerobatics, and this led in turn to the formation of an Instructors' School.

Nor was flying restricted to basic standards. The Curtiss JN-4 had been modified to carry cameras and, Vickers and Lewis guns for operational training. In Brancker's opinion, Canadian graduates, with training in air fighting technique, air reconnaissance, bombing and army co-operation, were better qualified than their UK counterparts. On arrival in England, they needed merely conversion to type before being posted to their squadrons in France. By October 1918, 'wings' standard was 70+ hours; the accident rate was down from 5 to 3%; and the fatality rate had been improved from one every 1,800 hours to one every 5,300 hours.

In January 1918 the first Canada-trained US squadron sailed for Europe, followed by the other nine according to plan. That month Gen Hoare moved to Texas while Allen returned to Canada. The severe winter weather was threatening to slow down flying training. To mitigate these problems, ski/wheel undercarriages were developed, and even in open cockpits training was not interrupted unless temperatures fell below -10^{o}F.

Achievements

With the arrival of spring, the RFC squadrons returned from Texas and so the Reciprocal Scheme came to an end. In a letter of 17 May 1918, Major General W L Kenly, Chief of the US Air Service, wrote of his appreciation:

> 'By its faithful and efficient work in the training of our cadets and enlisted personnel, the Royal Air Force has conferred a great and practical benefit on the United States Air Service.
>
> Equally important is the imponderable but undoubted benefit which has accrued to our men by instruction by, and association with, officers and men who have had practical experience at the front and with the conditions we are preparing to meet.'

This could well have been one of the first – if not the first – official appreciation from a foreign air service received by the recently-formed Royal Air Force.

By the time of the Armistice the flying training organisation in Canada comprised a total strength of 933 officers, 4,777 cadets, 6,158 airmen and

1,200 women. 200 pilots and 50 observers a month were being trained: a total of 4,057 pilots and 137 observers, including 370 pilots in ten US squadrons – the first to see action in France.

The cost of training a pilot worked out at £3,200; total cost was some £14M sterling. By November 1918, 2,900 land aircraft had been produced, to a value of $14M; plus 30 large flying boats for the US Navy. (Engines came from the United States. By the time of the Armistice a replacement had been developed – the 130 hp Clerget engine.)

Disbandment

The organisation was largely disbanded in early 1919, but remnants soon grew into the Royal Canadian Air Force. Gen Hoare said to Allen: 'This show will spoil you and me for ordinary peacetime soldiering.' And so it was to be. Hoare was awarded the CBE, returned to the Central India Horse as a major but soon resigned his commission and took up farming in Lincolnshire; his brother became head of supply to the South African Defence Forces and in the next war became the first Principal Supply Officer at Headquarters South-East Asia Command.

On his return to England Allen was awarded the Air Force Cross, and in August 1919 he accepted a permanent commission as squadron leader; his RAF Service Number was 0112. For a year or so Allen went from one dull staff job to another, mainly closing down stations and disbanding units. In May 1920 he was posted to Ismailia as Air Staff Officer at Group HQ but in December he was given command of his old squadron, No 8, and in April 1921 the squadron moved to Baghdad and took part in the air control of Iraq.

In January 1922 Allen was promoted wing commander and posted home. The journey became a leisurely progress, taking in a tour of India and the State Ball in New Delhi on the occasion of the Prince of Wales's visit. On arrival home he was sent on leave, then placed on half-pay.

In September 1922 Allen was given command of the Constantinople Wing, a formation thrown together to cope with the Chanak Incident. It says something for those leisurely days that even at a time of crisis Allen completed his personal movements by way of the Orient Express.

On the withdrawal of the wing; Allen was posted to the Air Ministry Directorate of Equipment. In 1925 he completed No 4 Course at the RAF Staff College, whence he returned to the Air Ministry, this time to the Directorate of Training. From 1927 to 1930 he commanded No 2 (Indian) Wing at Risalpur, which in 1928 mounted the air evacuation of civilians from Kabul.

Though he had reason to believe that the air officers whom he served throughout the 1920s (Air Vice-Marshals W G N Salmond and R Brooke-Popham and Air Commodore P B Joubert) thought well of him, the Air Council decided in 1930 to dispense with his services: he was once more placed on the Half-Pay List, and retired on 26 September 1933.

Meanwhile Allen had married in 1930; he became an Air Ministry civil servant, responsible for the development of civil airfields, where his experiences at Turnhouse in 1916 and at Fort Worth in 1917 came into their own. He introduced a scheme for classifying and licensing airfields, and personally selected sites at Prestwick, Ringway, Gatwick, and Elmdon, all to become local authority airports.

On the outbreak of war Allen was recalled by the RAF and posted to Halton, where he commanded one of the Apprentice Wings. A dispute with higher authority was resolved only after his appeal for redress was upheld by the Air Council. From 1940 he served as Senior Officer Administration in No 32 (Balloon) Group. Here the Allen papers come to an end, although his daughter recalls her father being appointed to the newly-formed British Overseas Airways Corporation.

When the Empire Air Training Plan was set up, neither Maj Gen Hoare (save on a tangential matter – the enlistment of US nationals) nor Allen, who wrote to the then Air Member for Personnel offering his advice in the matter, was consulted.

Allen died on 10 September 1971. The high point in his career undoubtedly came when, as a 27 year-old temporary lieutenant-colonel he had – to quote his own words – 'command of 15 RFC and 10 American Signal Corps squadrons in Texas'. There is no doubt that the qualities he displayed then and throughout his subsequent service matched those quoted at the beginning of this paper.

PROFESSIONALS, AMATEURS AND PRIVATE ARMIES

PILOT ENTRY PORTALS IN THE RAF EXPANSION OF 1934 TO 1939

Dr A Mansell

Before one can begin to train pilots one has to get hold of them in the first place. This paper is about how the RAF recruited pilots in the period of its expansion, from 1934 to 1939. To quantify the matter we can note that, prior to 1934, the RAF was training some 300 pilots per annum, a figure which rose to around 2,500 pilots per annum by September 1939, backed by a direct entry reserve of 5,646 pilots in various stages of training. The task was set out in the expansion plans which started with Scheme A in July 1934 and leapfrogged over one another until Scheme M had been reached in September 1939. The mechanisms for achieving the task lay in the various portals of entry which were available, or created, in that period. The work was overseen by the Air Council during sessions known as the Secretary of State's Progress Meetings which took place weekly from June 1935 to July 1940. The Secretary of State for Air at the outset was Sir Philip Cunliffe-Lister, soon to be Lord Swinton, who was an outstanding benefactor of the RAF. He was replaced by Kingsley Wood in May 1938. The portals of entry can be grouped under three headings, Professionals, Amateurs and Private Armies. Let us see what each of these were about, beginning with the Professionals, or perhaps, in the cricket parlance of the time, the Players.

Professionals

The Professional portals consisted of:

1. Cranwell
2. Direct Entry Permanent Commissions
3. Short (and Medium) Service Commissions
4. Service Airmen Pilots
5. Direct Entry Airmen Pilots

Sir John Slessor claimed that the English Public School was the best known system for producing leaders of men. This view was widespread in the 1930s so it is natural to find that the RAF wanted to fill its officer corps with as many public school men as possible. This depends on what one means by public school of course. Just as there were crack regiments or elite squadrons so there were rank orders amongst the schools with an

upper echelon occupied by what educationalists know as the Clarendon Nine, namely Eton, Harrow, Winchester, Westminster, Merchant Taylor's, Shrewsbury, Charterhouse, Rugby and St Paul's. The RAF tended to lose out in competition with the Army for public school men, especially Clarendon Nine types, but to compare Cranwell with Sandhurst was not appropriate, as Frederick Bowhill, the Air Member for Personnel, pointed out to Swinton. A better comparison was between Cranwell and Woolwich, both of which took around 75% of their entries from public schools. Between 1934 and 1939 Cranwell's entry consisted of 391 cadets, not counting a handful of Indian Air Force men. Only 9% came from Clarendon Nine schools, 31% came from excellent Victorian middle class meritocratic places such as Wellington, Marlborough, Cheltenham, Haileybury and Clifton; 35% came from a mixture of minor public schools and private schools; 8% were grammar school boys; 12% were Halton or Cranwell Apprentices and 5% came from the Empire. Cranwell's recruitment was always up to target throughout the expansion without any perceptible dilution of its entry standards. Cranwell Cadets were of course destined for Permanent Commissions and possibly for Air Rank. Direct Entry Permanent Commissions were awarded to men who had already distinguished themselves in some way, often by graduating at a University. I want to reserve comment on them until I come to the University Air Squadrons later.

Short Service Commissions were not popular with public school Headmasters or public school parents – and we must remember that we are talking about a time when parents still had legal control over eighteen year olds. A Short Service Commission in the RAF did not have the kudos of a short engagement in a first class regiment of the line to commend it. Men spent a few years flying about before passing on to other things – perhaps to the next world if they were in fighter squadrons. Swinton and his Meetings devoted time to considering what could be done about burnishing the image of the Short Service Commission. Bowhill thought that only representations at Ministerial level to public school Heads would stand any chance of success, but he was not optimistic. Swinton laid on an aircraft to take Winchester Housemasters on tours of RAF stations, so that they could see the luxurious lifestyles enjoyed by Short Service Officers in the Lutyen's designed Messes of the day. The effort was not very successful if we judge by Winchester entries to Cranwell in the period – namely three. The Newsreels were asked to stop showing film of RAF crashes, a request which was accepted by Gaumont British News. Liaison Officers, in the

shape of Cranwell Cadets or Direct Entry men from the Universities, were appointed to some selected schools – Eton being one of them. However, by December 1938 it had become apparent that to meet its expansion targets for pilots alone the RAF would need to capture 10% of the total annual output of boys with School Certificates, something which drove the search for men further into the territory of private schools or of the municipal grammar schools.

The Short Service entry also included many who had made their way to the UK, at their own expense and often without prior selection, from the White Man's regions of the Empire and the Dominions. The colour bar made sure that there were no Indian pilots flying in the Battle of Britain. Somewhat older men, like Bob Stanford-Tuck and 'Sailor' Malan, took up flying via the Short Service Commission after periods afloat in the Mercantile Marine. As was the case with Cranwell, the Short Service portal did all that was asked of it in the expansion. The various Schemes' requirements for Short Service men were either met or exceeded each year.

Now to turn to Service Airmen Pilots. These were pilots who did not originate in the public schools. Some came from grammar schools and some from council elementary schools. Their mode of production represents what an air conditioning engineer might refer to as a fug-stirring system, ie moving a given mass of air around a building without introducing any fresh. The Service Airmen Pilots were highly trained technicians, often from Halton or Cranwell, who after some years in their trade were given a chance to fly. To gain a pilot the RAF lost a first class technician and did so at a time when industry, also expanding to meet rearmament needs, competed with the RAF for apprentices and also for fully trained technicians who had reached the point in their service where they were eligible for re-engagement. A scheme was introduced in 1935 which attempted to offset the criticisms of our fictional ventilation expert. This was the Direct Entry Airman Pilot Scheme. After about a year, Bowhill told Swinton that the scheme would have to stop. 'Why?' asked Swinton, 'are the men no good?' 'They are good' said Bowhill, 'but they are not popular in the Service.' It is easy to see why. The Old Sweats who had spent years waiting for a go at the joystick saw men straight in from the street by-passing them. The scheme ceased in March 1937. It had recruited 357 pilots. Subsequently all Airman Pilots were drawn from the Service, at the rate of 400 per annum.

Now let us turn to the Amateurs. It is tempting to extend the cricketing metaphor again and refer to these as the Gentlemen, but some were perhaps

not Gentlemen as the term would have been understood in the 1930s.

Amateurs

The Amateur portals which I shall consider are: University Air Squadrons, the Royal Air Force Volunteer Reserve and the Auxiliary Air Force.

There were in fact three others: The Reserve of Air Force Officers, the Class F Reserve and One Year Reservists, all of which were ultimately absorbed into the Volunteer Reserve. Although they were of some importance, time prevents discussion of them here.

University Air Squadrons

The University Air Squadrons were one of Trenchard's best ideas. He wanted to see graduate officers in the RAF, to stimulate interest in the air amongst undergraduates and to develop strong links between the Service and the aeronautical and scientific research being done in the Universities. The first UAS was formed at Cambridge in October 1925. The idea had received strong support amongst the Engineering Dons, some of whom were old Farnborough hands. There were three flights; two of them were designated as Technical and Research Flights, the third was designed for the 'hunting' type of undergraduate, a species with less interest in technical affairs. Oxford set up its squadron ten days later. Until 1936 these were the only University Air Squadrons but in that year a third was created in London. The man behind this was Sir Henry Tizard – another major benefactor of the RAF and one of that other 'few', the scientists, to whom so many owed so much. Tizard was Rector of Imperial College, London, the Chairman of the Military Education Committee of the University, the President of the Imperial College Gliding Club and the Chairman of the Tizard Committee – which was busy with its work on radar. He found time to press for and to get a London Squadron. As an old test pilot himself and a great enthusiast for all things to do with the air he was inspired by very similar motives to Trenchard.

Membership of a UAS carried no liability for service and this made them unpopular with some. The Swinton Meetings deliberated about whether resources should continue to flow in the direction of the University Squadrons as the pressures of the expansion bore down upon them. Good sense prevailed and the squadrons continued to be supported to the extent that, at the outbreak of war, two more, at Glasgow and Nottingham, were in the process of formation. The squadrons produced what seems to have been good material. John Grandy, who had been Chief Instructor of the London

Squadron, sought out former University Squadron men when he was asked to form 249 Squadron for the Battle of Britain. Leonard Cheshire emerged from the Oxford Squadron and the RAF gained a second Victoria Cross with K Campbell from Cambridge. In September 1938 UAS membership came to carry Volunteer Reserve liability, something which had been progressively accepted by their members for some time before.

The University Squadrons were not mass recruiting agencies by their very nature but the three of them put the equivalent of seven squadrons' worth of pilots into the Battle of Britain alone, including Richard Hillary. What were they worth in terms of Direct Entry Permanent Commissions? Between 1928 and 1937, 156 such Commissions were awarded to University men, 128 of them came from the Universities which had squadrons.

The Volunteer Reserve

The most important amateur portal was the Royal Air Force Volunteer Reserve. It was a real brainwave and we can identify two men who made major contributions to the genesis of the idea. The first was Arthur Tedder, who was then an air commodore in the Air Member for Personnel's Department. The second was W L Scott, an assistant secretary in S7, which was that part of the Air Ministry Secretariat serving AMP, who wrote a memo in February 1936 which contained the blueprint for the new reserve. Scott's paper made it clear that a mass direct entry reserve would have to be created which would appeal to popular sentiment at the time. What was that sentiment?

In 1933 J B Priestley set off on a tour around England, looking at things and talking with people. Priestley was not a sociologist or a historian but he was a very good journalist, novelist and playwright – all activities which call for accurate observation and interpretation of affairs. In 1934, just about the time when the RAF expansion was beginning, he published his findings in a book called *English Journey.* There are three Englands, he wrote; the first is that of the history books, with its castles, cathedrals and great estates – the sorts of thing that the tourists come to see. It had long since ceased to earn its living of course. The second England was that of the Industrial Revolution, mainly located in the North East and North West. That was already beginning to show some of the signs of decay that we now see in such places. Then there was a third England. An England of the cinema, the dance hall, greyhound racing and the wireless; of mass produced motor cars, the by-pass, the motor coach and the filling station; of Woolworths and the department store, of factories which didn't look like

factories and factory girls who looked like actresses. An essentially democratic England this, where what you could actually do was beginning to count for more than who you were – or liked to believe you were. The young people in this third England, Priestley claimed, did not content themselves with playing chorus in an opera where the leading roles had been taken by their social superiors. Their heroes and heroines were meritocrats, sportsmen and sportswomen, film stars, and the likes of Amy Johnson or Malcolm Campbell. It was for this third England that the new reserve was designed.

Scott's paper called for a direct entry reserve based on what were described as democratic principles. In view of strong popular feelings in the country against any pre-determined social hierarchy, caste or old school tie distribution of commissions, all men should enter at the same level – that of airman pilot. Commissioning might take place later, or even at entry in a minority of cases, but always only according to proven aptitude. This question of democratic or social hierarchy commissions was really a matter of choosing between public schoolboys who might be lost by democratic entry and secondary schoolboys who might be lost by special hierarchy commissions. The secondary schoolboys won the day – but Etonians were to be found in the Volunteer Reserve!

Another popular mood of the time was anti-militarism so the sporting and recreational aspects of flying were to be emphasised in recruiting. Every effort was to be made to bring the reserve to the men by making access to it easy in geographical terms. Flying at weekends and on summer evenings was to be supplemented by ground training at conveniently located town centres providing good social facilities and helping to build up an *esprit de corps.* Tedder saw that the organisation must be quite different from that of the AAF, in spite of the fact that the new reserve would also consist of week-end fliers. The AAF was bound up with Territorial Associations and they, like their country gentry members were, in Tedder's view, moribund.

The new reserve was a brilliant concept, the product of forward thinking minds. What should it be called? Citizen's Air Force was one proposal considered by the Air Ministry but the one chosen was, of course, the Royal Air Force Volunteer Reserve. Through this portal was to pass the overwhelming majority of those who fought and died in the ensuing war. That the Volunteer Reserve was a truly democratic organisation and that the RAF is a good place for a career based on talent can be seen in the case of my old boss at Kings, the late Lord Cameron, who was Principal there.

He finished his RAF career as Marshal of the Royal Air Force Sir Neil Cameron, Chief of the Air Staff. He began it as Sergeant Pilot N Cameron of the Volunteer Reserve, flying a Hurricane in 1 and 17 Squadrons in the Battle of Britain.

The Auxiliary Air Force

The Auxiliaries were a rather special bunch and a number of books have been written about them. One of the best is *Flying Start,* the memoirs of Group Captain Sir Hugh Dundas who served with distinction in 616 Squadron. 'In all the history of arms', he writes, 'there can seldom have been a body of men more outwardly confident and pleased with themselves than the pilots of the Auxiliary Air Force.' Amongst them were lawyers and farmers, stockbrokers and journalists, landowners, accountants and playboys. They were passionately involved with flying – three dimensional fox hunting perhaps – and they were quite certain that anything the professionals could do, they could do better. The Auxiliaries represented *par excellence* that powerful amateur tradition which characterised so much of British life before the war. One effect of the cult of the amateur is to convey an assumption of almost effortless superiority. The gentleman amateur can stockbroke all week and play a first class game of cricket or Rugby – or fly a Hart superbly – at the weekend. The professional has to spend all his time at such pursuits! Dundas tells us that the pilots of 600 and 601 Squadrons openly referred to regular officers at Hendon as 'coloured troops.' There is no doubt that the Auxiliaries were first class squadron pilots and Squadron Commanders whilst some achieved high rank in the RAF. Nevertheless, the AAF had faults which became apparent during the expansion period.

To be an Auxiliary it was essential to be the right person from the right background. The expense of the Auxiliary lifestyle saw to that if nothing else did. All attempts to get them to modify their attitude failed. Approaches for help with the training of the Volunteer Reserve were rejected. The Narrative on Reserve Forces in the Public Records Office states that the AAF was, 'reluctant to sacrifice its exclusive character to serve wider interests. Its standards of expenditure and social rigidity were incompatible with a democratic reserve.' Even an attempt by Bowhill to get it to form a reserve of accountants – who might have been thought socially acceptable – was met with 'so violent' an opposition that the idea was hastily dropped. Kingsley Wood deplored the fact that Auxiliary Squadrons tended to become exclusive social clubs and Ginger Lacey, a classic example of a Volunteer Reserve sergeant pilot who flew with 501 in France

and during the Battle of Britain – in which he shot down more German aircraft than anyone else – referred to Auxiliary Squadrons as snobbish preserves of the rich. Did all this matter? I think that perhaps it did, if we remember that a major aim of the Expansion Schemes was to increase pilot numbers .

The AAF had been regarded as part of the front line force since 1930 but in January 1938 its pilot strength was 237 – around 50% of its peacetime establishment. In September 1939 it was still seriously under strength. A principal reason was the cost of belonging. Annual out of pocket expenses for an officer amounted to between £30 and £50 whilst an airman on the ground staff could expect to find £20. In the 1930s you could send your son as a day boy to a Clarendon Nine school for £50 per annum – today you would need to find about £6000. In January 1938 a Committee was set up under the chairmanship of the Under Secretary of State for Air to consider the AAF situation. The Committee reported in April 1939 and recommended increases in pay and allowances for the AAF. It also required them to accept airmen pilots, first by training some of their own ground crew where suitable, and then by taking in direct entry men. Many AAF squadrons reacted vigorously against this suggestion but reluctantly complied, so that we find a handful of AAF sergeant pilots in Battle of Britain squadrons.

Private Armies.

Finally we come to the Private Armies. These were grouped under two banners, the National League of Airmen and the Air League of the British Empire. The second is the more important. Whilst RAF expansion was taking place, the surrounding airspace was occupied by civil aviation and the light aeroplane clubs. The latter were dependent at the best of times on public subsidy, which helped to keep their fees down and encourage airmindedness. Just before the launch of the Volunteer Reserve, the National League of Airmen came up with their idea of Business Houses Flying Clubs. These were to be associated with Business Houses, the Midland Bank prominent among them and, in return for Government subsidy, each Business House would recruit up to 50 members per annum. These members would form an unofficial reserve of pilots at the A-Licence standard. The League came to the Air Council for support. Their proposal was so cleverly worded that Swinton realised that it would be politically almost impossible to refuse support – but he asked the League to postpone their venture until the Volunteer Reserve had been launched. The League refused to postpone and still got their support. Their launch caused delays

for the establishment of Volunteer Reserve facilities in London – but that is a story to be told elsewhere.

The most important private army was the creation of the Air League of the British Empire, namely the Civil Air Guard. Once again there is a relationship with the Volunteer Reserve, but this time it is the civil clubs who were under threat. When the Volunteer Reserve started training men to fly on the same airfields as those used by the flying clubs – and actually paid men to learn – many clubs began to wilt. To save them from extinction a scheme was drawn up in which clubs would train a reserve of pilots who could be called upon to fulfil a range of flying, or flying related, duties in wartime. Many later served as ferry pilots for example. Entry requirements were less rigorous than for the Volunteer Reserve and both men and women in the age range 18 to 50 were eligible for membership. Again, public subsidy was required, hefty enough to get fees to rock bottom levels. The Civil Air Guard saved the flying clubs and performed a generally useful service. Some of its members were earmarked for military service and one or two of them turned up in the Battle of Britain.

In conclusion, the expansion period can be regarded as having achieved many of its objectives in terms of pilot recruitment, in spite of great logistical difficulties. The shortage of instructors and aircraft caused much anxiety and at the outbreak of war a sizeable backlog of men awaited training in the Volunteer Reserve. Short of even a partial mobilisation after Munich there was little more that could have been done.

OVERSEAS TRAINING IN WORLD WAR TWO

Edgar L Spridgeon

During research into this subject, I saw two little statements in an official document: 'The only training for War is War' and reference to 'The Battle of Training'.

We know of the Battle of Britain, the Battle of the Atlantic, Berlin and others, but the Battle of Training proved to be no less important than some of the others in winning the war.

A Scheme in 1935 had aimed at doubling the size of the Metropolitan Air Force but by the 3 September 1939 the Royal Air Force was numerically inferior to the *Luftwaffe* in both manpower and aircraft.

It is said that in early 1939 there was a deficiency of over 1,000 pilots under training.

There was a huge demand to increase training facilities but to increase flying training needed many new airfields, aircraft and equipment and untold numbers of personnel to be recruited and trained – including many specialists, not forgetting ground staff and ground and flying instructors.

In wartime Britain, lack of space, uncertain weather, blackout restrictions, possible enemy interference, shortage of machines, fuel, food and many other things made the required tasks extremely difficult to fulfil.

A solution to the problem had, to some extent, already been under discussion for some time, for in 1935 the Governments of Britain and Canada had talked of the possibility of training RAF pilots in Canada, albeit on a small scale, and this in fact had been taking place. You have heard that similar co-operation between the two countries had also taken place during World War One.

What was the extent of the requirement for trained pilots and, therefore, how many trainees would have to be put into the system and when ?

The deliberations of the committee dealing with these most difficult questions were affected by other committees' plans for operational requirements as well as aircraft production.

There were so many factors to be considered such as: which way would the expansion go – bombers or fighters, and would the bombers have one or two pilots? At what speed would the expansion take place? What would be the required replacement rate, governed by operational losses and accidents, tour length, etc? What would be the required length of the training course from commencement of training to operational readiness? How many who started their training would fail to complete the course,

either due to failing to make the grade or accident ?

Obviously, many thousands of pilots and other aircrew would be required before very long.

I suppose that Group Captain Robert Leckie DSO DSC DFC (as he was in 1936) might be called the Father of the Scheme for World War II Flying Training. He was a Canadian pilot who had transferred from the Royal Naval Air Service to the Royal Air Force in 1918 and had stayed in the Service, to become the Director of Training of the RAF by the late 1930s.

In early 1936 he had written a Memorandum which suggested that Canada would be the best country in which to train a large number of aircrew. The final outcome of this was an Agreement for the formation of the Empire Air Training Scheme, later to be called the British Commonwealth Air Training Plan.

It was a four-party Agreement – Canada, the United Kingdom, Australia and New Zealand, with Canada playing the leading role and controlling the day to day operation through the Canadian Chief of Staff. The Agreement was signed on 17 December 1939 and was to run until March 1943, and it was then extended to March 1945.

The separate countries involved would operate independently but with a common bond and with overall guidance from the Air Ministry in London. Joint Conferences would be held and close co-operation achieved and the countries involved would share the cost on a pro-rata basis.

Talks had been taking place between the United Kingdom and South Africa, Southern Rhodesia and the United States of America to get co-operation for aircrew training in those countries and the talks had all been successful. The first schools were in operation by early 1940 and all the schools planned in the original Scheme were in operation by the autumn of 1941.

The Canadian Air Force in 1939 was quite small but after the Agreement was signed rapid expansion took place both in manpower and equipment and airfields sprang up in very quick time across the country. Aircrew volunteers, as in all the countries of the Commonwealth, were plentiful, with thousands of young people coming forward waiting ‘to have a go at the enemy’.

In the Scheme, Canada would have 80% of the training capacity, the RAF 10% and the Australians and New Zealanders who had received Elementary Flying Training in their own countries would go to Canada for Service Flying Training. The Royal Norwegian Air Force would also join the Scheme as a separate but integrated Unit.

The training organisation in the UK was developing rapidly concurrently with the Scheme in Canada. There had been a thought of carrying out some training in France, but the fall of France put paid to that idea and the approach of the enemy to the Channel coast made it necessary to relocate some operational units which meant pressure on the training units.

After Dunkirk, the Air Ministry arranged with Canada for the removal of training units from the UK to Canada and the initial plan was for four SFTSs to go quickly. The first one was No 7 SETS from Peterborough, which became No 31 SFTS in Kingston, Ontario. This move was followed by others until there were five RAF EFTSs and ten SFTSs in Canada. New units which had been planned for the UK were built in Canada and all the RAF units became part of The Plan.

EFTSs in Canada, as in several other parts of the world, were operated by civilians. Flying Club development had been fostered by various Governments with the idea of nurturing the interest of civilians in aviation in peacetime and the Clubs certainly allowed rapid development of Elementary Training Schools early in the War.

All SFTSs were Service organisations. At one time in Canada the idea was for a ratio of 61 twin-engine trainees to one single engined, no doubt expecting that twin-engined trained pilots would go to bombers and the singles to fighters, but many will know that the 'exigencies of the Service' did not always allow such plans to work.

In the UK in late 1941 'Grading Schools' were started at certain EFTSs with the object of weeding out those selected for pilot training who were not expected to achieve the standard required as pilot overseas, thus saving a lot of wasted shipping space.

A voyage across the Atlantic for those to be trained in Canada or the United States of America could be in anything from a converted meat transport to the *Queen Elizabeth* and could take from about six to twelve days. I shuddered when I read in the last edition of 'Proceedings', the report on the Seminar 'Seek and Sink'. I do not know of any shipping losses involving aircrew crossing the Atlantic by ship, but I know that some had hairy experiences.

On arrival in Canada, the early parties went to Toronto to await postings, but by November 1941 No 31 Personnel Depot had been opened at Moncton, New Brunswick, to serve as a buffer-depot for those arriving for training and those newly graduated aircrew waiting for ships to return to the UK.

In the early days of the war, the enthusiasm of the new recruits was not diminished by the time it took to get near to their flying training. There was a war to be fought, and they wanted to get on with it. They had done their Initial Training in the UK and some had flown at a Grading School, and at this stage, they could have been in uniform for about four months.

Course length and the number of flying hours to graduation varied with changing demand. One theory expounded was that heavy losses on operations led to shortened training courses and less flying time leading to lower standards leading to heavier losses.

Typically, EFTS and SFTS together lasted from 20 to 30 weeks with between 150 and 210 flying hours. Unfortunately the overall wastage rate in the RAF trainees was in the region of 19% at EFTS and 15% at SFTS and in August 1942 there was a directive saying 'Do not waste pilots unnecessarily'. Air Ministry policy dictated the percentage of those to be commissioned on graduation, and it would seem to have been in the region of 20 to 25%.

After graduating as qualified aircrew, it was back to Moncton to await a ship, the voyage, a spell at a Personnel Handling Unit, such as Harrogate, disembarkation leave, posting to an Advanced Flying Unit to get accustomed to the RAF way of doing things in a country at war, in a completely different environment, including blackout, in a completely different climate and weather. At this stage it could have been 18 months from volunteering for aircrew duty and 12 months from joining.

How successful was the Plan in Canada? Records show that the total of all aircrew trained in Canada between 1941 and 1945 was nearly 138,000, of which 54,000 were pilots.

At the peak, by June 1942 there were 27 EFTSs, 26 SFTSs, 10 Air Observer Schools, 5 Air Navigation Schools, 9 Bombing and Gunnery Schools, 4 Wireless Schools, etc. 15,000 aircraft of 20 different types were used.

What did it all cost?

The estimated cost of the EATS in 1939 had been 600 million Canadian dollars but the final cost was more like 11 billion dollars. The United Kingdom had paid a large portion of its share in aircraft, spares and equipment, etc., but according to a Canadian finance officer there was a debt of C$450 million outstanding in 1945. In 1946 the Canadian government wrote off this debt in thanks for Britain's war effort.

Another cost was nearly 900 who died or were seriously injured during training.

In Australia, in addition to u/t pilots who had received their Elementary Training, and navigators, air bombers and wireless operator/air gunners who had received their Initial Training before going to Canada, others were fully trained in Australia to meet Home Defence needs and for service with the RAF. Units included Initial Training Schools, E & SFTSs, Observer and Navigator Schools, Bombing & Gunnery Schools, and for Home Defence a CFS and OTUs and a General Reconnaissance Navigator School. All trainees were recruited in Australia and in all, 27,400 were trained there.

In New Zealand, the arrangement ran parallel with the Australian training, but there was no training of Observers or wireless operator/air gunners. There was all-through training for Home Defence and the RAF, and schools included ITS, E & SFTS, CFS, GR Navigation and Bomber and Fighter OTUs.

All were recruited in New Zealand and 5,600 were trained there.

In South Africa, as the result of an offer made in the spring of 1940, an Agreement was signed on 1 June 1940, to run for the duration of the war, which led to the expansion of the existing facilities for pilot training and the setting up of a number of Air Observer Schools and the removal of two Observer and one GR School from the UK. A large number of RAF personnel went to South Africa on loan and cadets went out after ITW and grading in the UK. They flew alongside South African Air Force cadets and the output was nearly 25,000 aircrew.

In Southern Rhodesia, there was practically no training organisation in 1939, but a comprehensive scheme evolved after a discussion between the UK and Rhodesia and some local recruits and some RAF cadets sent out from the UK started training in May 1940 and four pairs of E & SFTSs were eventually established. There was also a CFS, a combined Gunnery and Air Observer School and other units. Some were sent to Rhodesia for training from the Middle East, India and other Commands in that part of the world. Also some Greeks and Yugoslavs operating with the RAF were trained. Due to the geographical location it was usual for the Southern Rhodesian graduates to go straight to OTUs in the Middle East and some went for GR Training in South Africa. The total output was 10,000.

The voyage from the UK to South Africa took in the region of six weeks and I have heard some hair-raising stories of what the conditions were like on board ship.

There remains the training in the United States of America and here again is a case of history repeating itself from World War One.

Talks started in 1940 which led to an offer by General Arnold to train 4,000 pilots for the Royal Air Force in spite of a Neutrality Act designed to keep Americans out of other people's wars. The offer was readily accepted and the first party of 533 arrived in June 1941 to commence their training, having completed their ITW in the UK. Later groups had also been through a Grading School before leaving home. In the 'Arnold Scheme' they flew alongside US Army Air Force Cadets in the southern states of Alabama, Florida, Georgia and South Carolina and the system was different from anywhere else, whereby the training was in three parts, Primary, Basic and Advanced, each taken in a different location. The Primary Schools were civilian operated and the others fully within the USAAF. A total of 200 hours in about 30 weeks and the award of RAF and US Sterling Silver Wings and a Diploma to show for it. 7,800 entered the Scheme for training between June 1941 and February 1943 and 4,370 graduated. Nearly 600 were retained in the United States for up to nine months as Flying Instructors.

The US Naval Air Service was not going to be outdone and Admiral Towers offered to train pilots, GR navigators and wireless operator/air gunners, mainly at Pensacola, Florida, and there was an emphasis on flying boats for the RAF and carrier aircraft for the Fleet Air Arm pilots (the training of the Fleet Air Arm was the responsibility of the RAF throughout the war). There was a plan to form crews to fly aircraft from the USA to the UK on delivery flights, but this did not work out and the GR and the WOp/AG training ceased early, but the pilot training continued from 1941 to 1945. Approximately 4,000 were trained by the Navy and the pilots received RAF and Gold US Navy Wings.

The third scheme for pilot training in the USA was the formation of six British Flying Training Schools and I see a number of persons here today who trained in a BFTS. The schools were run on RAF lines but operated by civilians, including ground and flying instructors, with an RAF squadron leader CGI, a flight lieutenant Admin and an NCO Armament Instructor who also doubled as the NCO disciplinarian.

Each pair of schools shared a CFI to advise on flying training techniques. Initially, the training was similar to the USAAF in as much as it was in three stages, but all were carried out at the same location, and they were known as All Through Schools. Later this was reduced to two on the lines of E & SFTS. The course length was initially 20 weeks and 150 hours but this was extended to 27 weeks and 200 hours. The schools were located one in Arizona, one in California, one in Florida, two in Oklahoma and one

in Texas. The scheme operated from 1941 to 1945 and for some time US cadets were taken into the British schools for training. Over 4,000 RAF pilots were trained in the BFTSs.

A fourth scheme in the USA was for the training of Observers and the whole of the capacity of the Pan American Airways School at Coral Gables, Miami, Florida, was used for the benefit of the Royal Air Force and in 1941/42 over 1,250 were trained.

A total in the region of 16,000 aircrew, including about 14,000 pilots, were trained in the USA during World War II.

Adding up all the all the figures, a grand total of approximately 220,000 aircrew were trained overseas in the countries mentioned.

Not least of the lasting benefits of being trained overseas was the widening of horizons for all the young men involved, who met and became very good friends with people of so many different nationalities. Many of those friendships are still enduring, as evidenced during the number of overseas reunions which still take place.

PRE-LUNCH COMMENTS

Flight Sergeant Burningham, Volunteer Reserve 1938, Fairoaks, and earning money. I earned more money at week ends and we even managed to get our girlfriends into the club. We were trained by civilian instructors on Tiger Moths. I then went on to CFS where I was a flying instructor for two and a half years. I am fascinated in all that I hear today and as you see I did survive with quite a few hours.

Anon 608 squadron, Aux AF, based at Thornaby from the 1930s onwards was mainly composed of ICI workers from Billingham. Later they did have an influx of personnel from the West Riding, mainly of people in the woollen industry.

Former NCO pilot, 501 and 602 Squadrons. Just a point that the last speaker missed out Kenya, which had an EFTS and Iraq, which had moved No 4 FTS from Egypt.

Saxon. Observer/Navigator, Volunteer Reserve. I liked the allusion to Tedder having opened one of the major 'Portals' into the RAF. Just a couple of points; There was a mention of tradesmen training as pilots with the consequential loss of a good tradesman but, my reading of the times was that Bomber Command in 1939 depended greatly on some exceptional NCO pilots who had come through that route and secondly, the man responsible for initial training at the end of the first war also became responsible for initial training in the Second World War, those who were Critchley Greyhounds were proud of the connection. Fifty years ago I was at Air Observers School in South Africa and my training from reporting at Lords cricket ground to posting to OTU took a little under two years.

Ian Wormold. Central Flying School and more recently British Aerospace. I have noticed some architectural evidence of Marshalls and also Blackburn's factory having personally been inducted from those commercial sites; they haven't been mentioned and I would like to hear more about them, perhaps over lunch.

Sir John Gingell. May I make a couple of observations before we break for lunch. First I would like to pick up a point already made about the length of time it took to get anywhere near a squadron. I started my flying training at the end of 1943 and I actually got back to this country on VE Day. It really was a terribly long time. The other relevant point is that the Royal Air Force had a tremendous influence because of the spread of

training globally but equally we had the enormous advantage of the Commonwealth and all those splendid chaps that they produced themselves who were so vital to us particularly in Bomber Command where we flew with mixed crews for a very very long time. I had the privilege of being a Commissioner of the War Graves Commission until fairly recently and one of the things that is very noticeable as you go round the various cemeteries in Northern Europe is the way the Commonwealth is represented in a crew; an RAF captain. a New Zealand navigator and so on and so forth.

FLYING TRAINING IN INDIA 1942-44

Air Vice-Marshal A D Dick

As I understand it, the Royal Air Force had set up the flying training organisation, along its traditional lines, to train the expanding Indian Air Force. The staff were about 85% RAF, and 100% at Flight Commander and above.

The Organisation had a staff representation in Air HQ Delhi: in the field it comprised: (Fig. 1)

a. In Initial Training Wing, at Walton, near Lahore.

b. Two Elementary Flying Training Schools (EFTSs), one at Begumpet, near Hyderabad, and the other at Jodhpur.

c. A Service Flying Training School (SFTS) at Ambala, about 125 miles north of Delhi. This undertook the advanced flying training for pilots and for observers. There was also a small Flying Instructor's School.

d. No 151 OTU which was based at Risalpur until April 1944, then at Peshawar, both in the North West Frontier Province.

There were other training units – such as conversion units –which I do not count as part of this flying training organisation, and which I shall not cover – typically some RAF conversion units – for instance the Thunderbolt and Mosquito conversion units at Yelahanka near Bangalore.

On many intakes a small element of RAF personnel was included; I was one of those, and my experience and analysis of my log-book forms the basis of this contribution. As the whole syllabus was unusual as late as 1942/43, and seems likely to have been representative of RAF training from many years previously, it was thought that some detail would be of interest, and just a little 'Nitty-gritty' detail about the training itself would not be out of place.

The RAF entrants comprised men who had either voluntarily transferred from other Services (we had three from the Army and one from the Indian Police), or from a branch other than GD in the RAF (there was one squadron leader from the Equipment Branch on the course ahead of mine); or UK civilians working or living in India, who had taken special steps to join the RAF rather than be conscripted into the Indian Army. I know of no u/t aircrew sent to India for training.

Both pilots and observers were required and accepted for training, and

the sequence was thus: (Fig 2).

The 10 weeks ITW course comprised the usual regime of intensive 'square-bashing', PT and ground school, which was extremely wearing in the intense heat of summer in the plains of northern India – long before the provision of air conditioning. Thence pilots went on to one of the two EFTSs, but the observers went straight to the SFTS.

The EFTS course lasted 11 weeks, and the aircraft flown were Tiger Moths. Communication between Instructor and pupil was by 'Gosport Tube' only. In my training there I flew 130 sorties, 51 of which were dual (including three formal tests) and 79 solo – all by day. 16 of the dual sorties were instrument flying under a hood; aerobatics featured strongly – on 75 of the sorties, 47 of them when solo; four of the dual sorties were low-flying; three of the dual and one of the solo sorties were pilot navigation cross-countries. I left EFTS with 117 hours flying time, 76 of which were solo; and I had done 8½ hours dual instrument flying under the hood.

Pilots then progressed to the SFTS Course which lasted 25 weeks. The aircraft which we flew on our course were the Hawker Hart variants – Harts and Audaxes . The essential differences between them were that the Harts had stub exhausts and a tail skid; the Audaxes had long exhaust pipes on each side of the fuselage, and hence could be flown at night; ours also had a tail wheel, which helped for night flying, and enabled them to use a runway. Most of the aircraft had not been converted to dual control. The back cockpit was rear-facing, and there was a prone position (head beneath the pilot's seat) with a sliding hatch through which the observer could aim bombs and take drift sights, etc with the CSBS. Bomb racks were fitted, as were fittings for fixed aerial cameras. Again, communication was by 'Gosport Tube' and no R/T was fitted.

Ambala was a large grass airfield, with its apron and a short east/west runway on its south side, and the grass area to the north. Take offs were carried out on the southern half of the grass area, and landings on the northern half. There were often 20 to 30 aircraft airborne, and one had to have one's eyes open and one's wits about one whilst in the circuit, especially when it was necessary to change the direction of take offs and landings! 'Re-joining the Circuit' was a serious formal procedure, of which noting well the contents of the signal square outside the Duty Pilot's office was crucial. The SFTS comprised an Initial Training Squadron and an Advanced Training Squadron.

The aim of the Initial Training Squadron phase was to make pupils proficient in flying the Hart variant. My phase comprised 70 sorties, of

which 31 were dual and 39 solo. A breakdown of the principal types of sortie I flew during the ITS Phase is thus: (Fig 3). The phase was well structured; the instrument flying, runway landings and some of the cross-country flying was completed before the night flying; the formation flying was one of the last items. At the end of this phase we were authorised to carry fellow-pupils as passengers.

The Advanced Training Squadron phase focused on Applied Military Flying. As shown, (Fig 4) mine comprised 62 sorties as pilot, of which 54 were solo – four at night. Eight sorties were dual, three of which were formal tests; two were at night. Seven sorties were as passenger, two being demonstration sorties and five being as crew member for a fellow pupil.

Details of my sorties and hours on receiving my brevet were exactly balanced between Tiger Moth and Hart variant. My overall total flying hours were 237, of which 167 were solo and 69 were dual. I had received 12 hours dual Instrument Flying and done 1 hr 40 mins as 1st pilot under the hood in the front cockpit with a crew member as safety look-out. Under the hood, the dual instruction did include stalling and spinning and recovery, but I do not recollect having had any instruction on recovery from what we would later call 'Unusual Attitudes'.

Most pilots passing out from the SFTS then went on to No 151 OTU at Risalpur to be trained to fly Hurricanes, and thence on to squadrons. A few, who were needed as flying instructors, stayed at Ambala to do a Flying Instructor's Course, after which they either stayed at Ambala or were posted to one of the two EFTSs.

Six of our intake were kept to be trained as Flying Instructors. For those of us destined to stay on at the SFTS, which was gradually being re-equipped with Harvards, the main tasks were conversion to the Harvard and, of course, the usual one of learning the 'patter' by heart, and then learning how to repeat it in the air, whilst co-ordinating it with the control actions needed. We had to learn the 'patter' from Roneoed sheets – we had no manuals; but it was classical CFS patter, albeit probably dating from some years before the war. A breakdown of the sorties I flew is here: (Fig 6).

When our instructors considered we had reached an adequate standard we had a flying test by the CFI, on the type of aircraft on which we were to instruct, and were awarded the Category 'Qualified (single Engined)' – 'Q(SE)'. I received my brevet on 12th March 1943, and flew with my first four pupils on 8th April.

Changes had to be made to the syllabus with the introduction of the

Harvard, but my log-book gives me no breakdown of sorties pupils flew, though I believe that the overall hours and sorties were much the same. Some of the applied flying exercise which had been done on the Hart variants could not be done on the Harvard, certainly the two wind-finding and the aerial photography exercises, and the student mutual instrument flying sorties. I see the value of these exercises as having been in giving a pupil pilot an appreciation of the rear crew member's tasks and abilities relative to his own; and of the difficulties which the pilot could compound by poor flying – or alleviate by smooth and accurate flying. Both the mutual experience, and the responsibility of flying a fellow pupil as passenger, did add confidence.

In the Harvard syllabus more sorties were added for circuit work with the greater cockpit management tasks and procedures compared with those on the very basic Hart, which was little more than a larger Tiger Moth. To counterbalance that, the Harvard was easier to fly. My log book shows emphasis placed on flapless landings, which had no equivalent on the Hart, and on precautionary landings rather than on forced landings. Low flying instruction was expanded to include formal bad weather low flying as well as that at normal speeds. My log book also shows that on the Harvard I gave more dual on steep turns than on the Hart. One real bonus was the addition, with Harvards, of dual low-level pilot navigation sorties – a most relevant and useful exercise – and more instrument flying. On the night flying syllabus, landings using the aircraft's landing lights (absent on the Audax) were substituted for landings with the aid of the Chance Light. R/T in the form of the TR9 set, and hence electrical intercom as well, was gradually introduced after we had had Harvards for about six months; up to then communication was still by Gosport tubes and the circuit was 'Free Range' as with the Harts/Audaxes.

I imagine that the course at 151 OTU was typical of that at other contemporary Hurricane OTUs. A breakdown of the sorties I flew is here: (Fig 7). It was divided into three phases – conversion into Hurricanes, during which I flew 25 sorties; applied flying on Hurricanes, during which I flew 21 sorties; and air gunnery, on which I flew 28 sorties, six of them dual.

Thus had I gone straight to OTU after training, I would have reached my squadron having flown 336 sorties (246 solo/1st pilot), in 310 hours (240 solo/1st pilot).

Those pilots who had flown only open-cockpit biplanes seemed to have had little difficulty in converting to the Hurricane via Harvards, despite

having to contend, for the first time, with a far more complex cockpit, which was also enclosed; cockpit drills with disciplined vital actions and engine handling which included constant speed propeller and supercharger; and an R/T-controlled regime for the first time. It would be interesting to be able to compare how much easier was the conversion to Hurricanes for those pilots who had done all of their training at SFTS on Harvards, in an R/T-controlled environment.

However perhaps really it was yet another manifestation of Sidney Camm's genius in that he *designed* the Hurricane to fly just like his biplanes! After all, if you removed the upper mainplane of the Audax – and the undercarriage – added an enclosed cockpit, what have you got?

Fig 1

INDIA — 1942-1944
FLYING TRAINING STATIONS

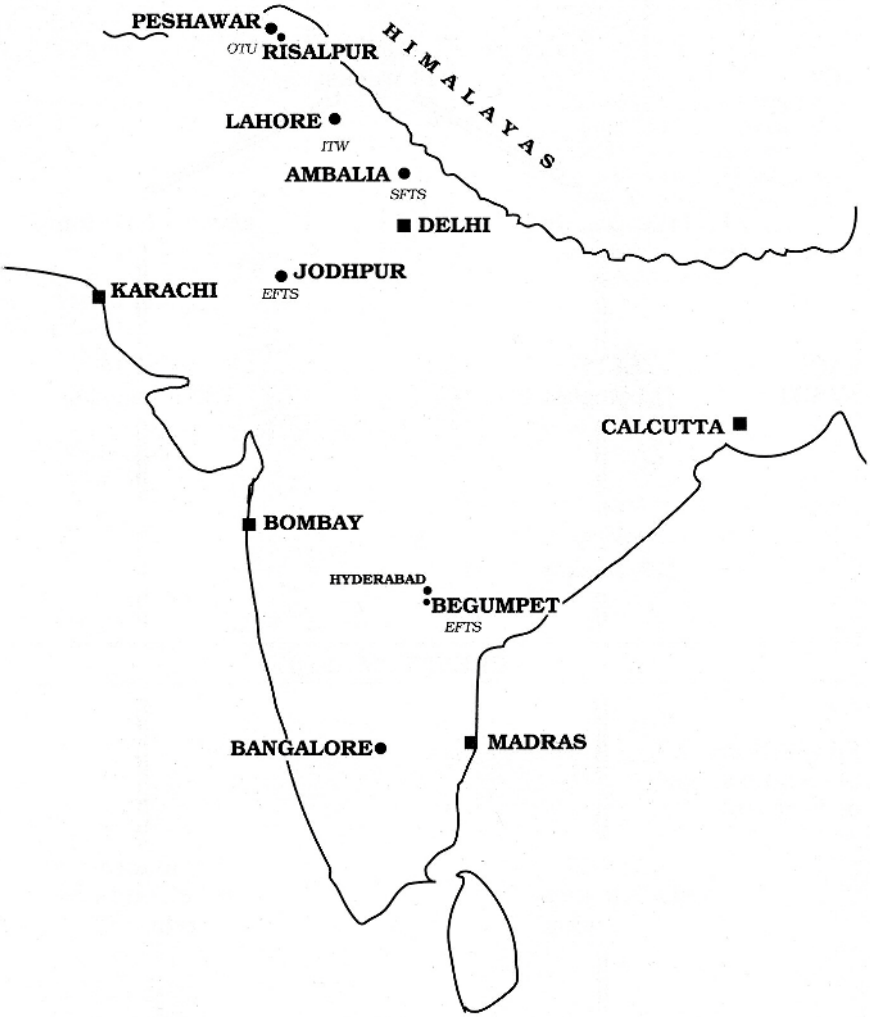


Fig 2

PILOT AND OBSERVER TRAINING IN INDIA 1942-44

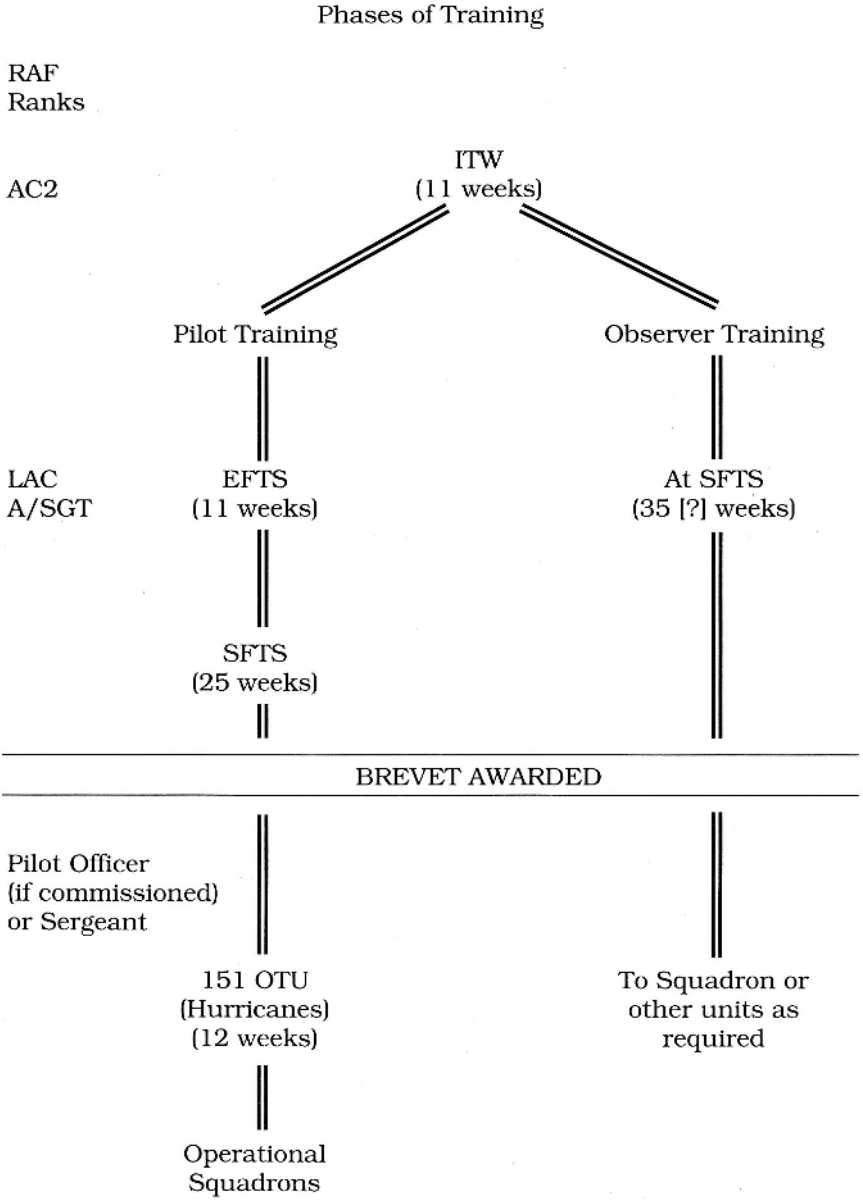


Fig 3

SFTS TRAINING ON HART VARIANTS IN INDIA — 1942/43
BREAKDOWN OF SORTIES IN ITS PHASE

Ser	Heading	SORTIES			Notes
		Solo	Dual	Passenger	
	(a)	(b)	(c)	(d)	(e)
1	General Flying	26	17		
2	Pilot Navigation	4	2	2	The two pax sorties were in a Leopard Moth for checking proficiency in map reading. The solo sorties involved landing at Delhi; on the first two we carried a (brave) Instructor as passenger — in a non-dual aircraft!
3	Night Flying		3	1	
4	Landing on Runways	5	2		Audax only.
5	Instrument Flying		5		Under a hood in the front cockpit.
6	Formation Flying	1	4		
	TOTALS Sorties	39	31	2	
	HOURS Day	31	21	4	
	Night	2	2	<2	

Fig 4

SFTS TRAINING ON HART VARIANTS IN INDIA — 1942/43
DETAIL OF ADVANCED TRAINING SQUADRON SYLLABUS

Ser	Heading	SORTIES				Notes
		Solo	Dual	Crew member	Passenger	
	(a)	(b)	(c)	(d)	(e)	
General Flying						
1	Practice and Revision	12				Two at night.
2	Instrument Flying	2		1		
Applied Flying						
3	War Load Ceiling climb	1				Usually to about 14,000ft — no oxygen!
4	Wind Speed and Direction Summers' method	3				One at night.
5	Wind Speed and Direction 3-course method with CSBS	2		2		
6	Pilot Navigation	3			1	One demonstration using 1:1,000,000 map.
7	Formation Flying	12	1			One solo was at night.
8	*Aerial Photography*					
	a. Stereo pairs	1		2		
	b. Fixed Obliques	1				
	c. Line Obliques	1				
9	*Air Gunnery*					
	a. Air-to-Air	5	2			Mostly camera gun.
	b. Air-to-ground	6	1			
10	*Bombing*					
	a. Low Level	3			1	Demonstration.
	b. High Dive	2	1			
11	*Formal Tests/Checks*		3			Two at night.
TOTALS — Sorties		54	8	5	2	
HOURS — Day		55	5	7		
Night			4	<1		

Fig 5

SUMMARY OF FLYING COMPLETED ON AWARD OF BREVET IN INDIA 1943

Ser	Heading	Total Pilot	Dual		Solo/1st Pilot		Passenger	Instrument Flying under hood
			Day	Night	Day	Night		
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
	Tiger Moth							
1	Sorties	130	51		79			19
2	Hours	117	41		76			8
	Hart/ Audax							
3	Sorties	132	36	3	86	7	9	5
4	Hours	120	26	2	85	6	10	4
	TOTALS							
5	Sorties	262	87	3	165	7	9	24
6	Hours	237	67	2	161	6	10	12

The next paper was researched and written by Flt Lt Ken Delve of 2 Squadron who was suddenly sent to the Gulf. It was presented at short notice by Flt Lt (now Sqn Ldr) Peter Jacobs, a navigator in Phantoms and then Tornados.

RAF AIRCREW OPERATIONAL TRAINING 1939-45

When Bomber Command was established in 1936 it took over an organisation and basic structure that had, in its essentials, been in existence since the mid-1920s, but was now in the process of changing over from a small-scale force of light/medium day bombers and in a limited sense night heavier bombers.

It is essential to understand the position of Bomber Command in the critical period of 1936 to 1939 in order to appreciate the problems for the training organisation. There was more to expanding the size of the bomber force than merely building more bombers, and not least of the problems lay in the provision of the manpower, both aircrew and groundcrew.

To illustrate the point, the standard day bomber of the mid-1930s was the two-seat Hawker Hind. A typical squadron comprised up to 20 pilots plus the wireless operator/air gunners. Assuming that half the pilots had to be replaced each year and that the total force comprised some 20 squadrons, the training organisation needed to produce 200 pilots a year. If it was then decided to double the number of squadrons then the annual requirement would be 400 and so the training organisation would also have to double in size. There was then the question of where the instructors would come from? If they were taken from the squadrons then the number needing replacement would increase yet again – a circle of ever-diminishing returns. It now became more complicated.

The next question was, 'how quickly could extra pilots get to the squadrons?' On average it took 15-18 months to train a bomber pilot, so from the decision to expand the force it would be at least 18 months before the first pilots reached the squadrons – and that assumed that the training machine was in place from day one! If it was then decided that the new heavier bombers required two pilots then the training would immediately double, imposing yet another drain of experienced pilots back to the training organisation.

So when eventually six or seven aircrew, each with his own specialisation, were required for each bomber then this put an immense strain on the training organisation, especially since many of the specialist roles were new.

All these problems were faced by Bomber Command whose success in providing the trained aircrew to the squadrons is one of its rarely recognised achievements. It was never easy; many mistakes were made and improvisation was often the key – that and the dedication of the staffs of the training units.

As early as 1937 the CinC, Sir Edgar Ludlow-Hewitt, had expressed concern over the prospect of rapid expansion and re-equipment at the expense of crew training and lack of suitable equipment. Surprisingly only pilot training was addressed as part of the overall RAF expansion scheme. It was eventually realised that the only solution was to reduce the front-line strength by allocating certain squadrons as training units. The policy began with pairs of squadrons at nominated stations becoming 'Group Pool' squadrons tasked to provide trained crews for the others. By April 1940 there were eight such units. The basic course lasted six weeks and comprised some 55 flying hours for pilots, observers and air gunners. The training attempted to rectify some of the problems revealed in the first months of the war, one of the main difficulties being that crews had trouble finding their targets in the dark – the poor standard of training simply had to be rectified.

The 'Group Pool' concept was short-lived and the units soon lost the squadron numbering to become designated simply as Operational Training Units (OTUs). Before long the OTU had become the key element in the training machine as the final step before a crew joined its operational squadron, and the basic structure of the OTU remained unchanged throughout the war.

Operational training was of course the culmination of a much longer process. After aircrew selection a trainee went to an Air Crew Reception Centre for a ten day period of kitting out and basic instruction. Here he got the first taste of discipline as well as aptitude tests, maths and general knowledge.

Next came the Initial Training Wing for 12 weeks of ground training. The syllabus consisted of drill and PT plus lectures on Morse code, gunnery, navigation, aircraft recognition and meteorology.

Moving up from the lowly rank of AC2 to LAC, the prospective pilot went on to the Elementary Flying Training School (EFTS) to begin flying training. The standard EFTS basic trainer was the excellent Tiger Moth, although the Miles Magister was also used.

Having been graded for multi-engine aircraft the student moved on to the Service Flying Training School (SFTS) equipped with Ansons or

Oxfords. The idea was to convert him to a more complex aircraft as well as a new series of air exercises including instrument flying.

Next came the Operational Training Unit. One of the most important purposes of the OTU was to find the right mix of individuals who would 'gel' together as an operational crew. In the first instance this was left to the individuals, the brief being that they should form into crews – those remaining would be allocated by the instructors. Some naturally gravitated towards each other, perhaps having met at various stages of training – others joined by recommendation.

The OTU was a different world after EFTS and SFTS: many were operated along the lines of operational squadrons with all that implied by way of high jinks. The syllabus was intended to provide the crew with basic handling and operational skills. Almost all the instructors were on rest tours from operations and therefore able to pass on the benefits of their experience. In the early days of 1940 and 1941 the courses were as short as they could possibly be with crews being posted to squadrons with the bare minimum of training. But by 1942 the courses had stabilised at a notional 80 hours with the inclusion of more instrument flying and night flying. With a posting to a squadron the 18 months process was complete. Yet although the crew were reasonably proficient in the operation of a bomber aircraft they had received almost no real operational training. Most Squadron Commanders endeavoured to give 'fresher' crews time to settle down and acquire more experience, including taSking them against theoretically 'easier' targets and new pilots usually flew as second 'dickie' with an experienced crew for one or more trips before being let loose with his own crew. This was very much dependent on the needs of the moment – if numbers were short then so was the introduction.

1942 proved to be the turning point in many respects. Bomber Command was at last receiving the four-engined heavies in increasing numbers and the experiences of over two years had been fed back into the training system. It was also decided that bombers would carry only one pilot and that a bomb aimer would be introduced into the crew – thus reducing the workload of the navigator. With two additional air gunners being included with the wireless operator, the basic heavy crew now stood at six. Another long-standing problem was also addressed – that of the flight engineer. When No 7 Squadron re-formed as the first heavy squadron with the Stirling bomber in late 1940 there were no flight engineers and so a number of groundcrew were selected and put through a squadron training programme. Soon after, the first qualified flight engineers started to reach

the squadrons. By May 1942 the first course started at St Athan and lasted six weeks. The posting procedure at that time seemed somewhat arbitrary.

The OTUs had always undertaken operational flying, usually on such tasks as leaflet dropping over France, as a way of introducing new crews to operational requirements and the thousand bomber raids of mid-1942 included both staff and student crews from the OTUs. For example, of the 1,047 aircraft which attacked Cologne on the night of 30/31 May the OTUs provided 299 Wellingtons, 21 Whitleys and 45 Hampdens. Although this was to be the largest single contribution by the OTUs, they participated in many other Main Force raids often suffering heavy losses.

This caused some discontent amongst those who thought they were on a rest period away from operations. Equally there were others who enjoyed the break from the 'dangers' of training flying. According to the Bomber Command Operational Research Section the big raids aroused great enthusiasm and served as a welcome break in the routine of the OTUs.

The OTUs tended to receive the old and battered aircraft no longer fit for squadron service and were last in line to receive modifications and improvements. All this added to the danger of flying with an inexperienced crew!

The introduction of the new four-engine heavies brought many other problems in that they were different from the Whitleys and Wellingtons being flown at the OTUs. Initially, therefore, an additional four aircraft per squadron were provided as a mini 'conversion flight' but this solution was far from ideal as the squadrons were not established as training units and the level of instruction was variable The next stage was to combine these extra aircraft into conversion flights for each group, again not an ideal solution, so finally the Heavy Conversion Units (HCUs) were born. The idea was that the crews could then convert to type ready for their squadrons. The early exception to this was the Lancaster where all available aircraft were required on the squadrons, although crews did go to a Lancaster Finishing School for a short introduction to the aircraft.

As the war progressed and operational experience was gained, a wide variety of specialist training units also appeared within Bomber Command many involving no more than about a week's training – an example being the Night Vision Schools, often incorporated within the HCU and specialising in teaching aspects of identifying targets at night.

By early 1944 it was recognised that although the war still had some way to go there was no need for large numbers to begin the 18 month route to an operational squadron and so the huge training organisation began to

run down. It had undoubtedly done its job as the success of Bomber Command depended ultimately on the standard of its training. That training was bought at the price of over 5,000 aircrew killed before they had a chance of a go at the enemy.

HEAVY CONVERSION TRAINING

Sqn Leader Jack Currie

There's a scene in an old Hollywood World War I movie called *Dawn Patrol*, in which a batch of replacement pilots arrive to join a hard-pressed squadron in France. The Flight Commander asks each pilot how much solo he has in his log book. 'Seven hours, Sir,' says the first proudly; 'Six', says the next. The Flight Commander shakes his head and sighs.

Now if I'd been asked that question when I joined No 12 Squadron in 1943, the answer would have been '235, Sir, plus another 190 dual or co-pilot.'

The last forty hours of that long apprenticeship were flown at a Heavy Conversion Unit in No 1 Group, Bomber Command, and it's that final three-week phase of a bomber pilot's training which is the subject of this talk.

My HCU was No 1662 at Blyton, near Gainsborough (frequent winner of the contest for the dreariest town in Lincolnshire). It was there that the five-man crew we had formed at OTU gathered – pilot, navigator, bomb-aimer, wireless operator and rear gunner. It didn't greatly concern me that the new gunner was only 17 (and looked younger), boys could fire Browning guns just as well as men – but I was slightly surprised that the engineer was no older. I had rather been expecting a horny-handed ex-mechanic – like a US Army Air Force crew chief. But at least I was no longer the youngest member of the crew.

Blyton had an establishment of 16 Halifax Vs and a similar number of Lancaster Is or IIIs. The gunners were detached to Binbrook for air-to-air firing practice, while the flight engineer and I got to know the Halifax. We flew circuits and bumps, and did five map-reading exercises for the bomb-aimer's sake. The wireless-op came along, too, in case we achieved a state of lostness.

Pilots who only ever flew the Halibag won't hear a word against it, and I grew quite fond of it myself when I was instructing between tours, but compared with the Lancaster it had a few defects. In the cockpit, for example, the blind-flying panel was as you would expect, but the layout of the other instruments looked as though it had been decided by a committee.

Another thing was that while three of the levers on the pilot's right worked in the natural sense – wheels up or down, flaps up or down, seat up or down – the fourth was different. It made you wonder how many Halifax pilots, having heard 'bombs gone' as they transited the target, tried to close

the bomb-doors, but lowered the wheels or flaps instead – or the seat.

My impression was that structured flying training actually ended at the OTU. From there on, the guy in the right-hand seat wasn't an instructor, but a tour-expired pilot, screened from operations, acting as a supervisor while you circuited and bumped. Naturally, they had varying ideas about how to fly the aircraft and little notion of instructional technique. What you had to do was to read the Pilot's Notes and work things out yourself.

I must admit that I've never understood why we flew the Halifax at all. That piece of the training seemed as redundant as the (P)AFU course, where I flew 35 hours in the Oxford – no more advanced an aircraft than the twins I'd flown in America. The Halifax and the Lancaster had different flying characteristics, different cockpit layouts, different crew locations and different performances. As a lead-in to the Lancaster, the Halifax (and this is only my opinion) was of little help.

As for all those map-reading exercises – they weren't much use either when we joined the squadron. On the rare occasions when we crossed the coast of Europe before night had fallen, the most map-reading the bomb-aimer was required to do was to distinguish between one Frisian Island or one lowlands coastal feature and another. At that time of the war, map-reading in daylight was as often needed as the close formation flying I'd practised in the States. Air Marshal Harris required much of his pilots, but seldom close formation.

The Lancaster, of course, was a pussy-cat to fly, like an Anson with four engines, and conversion was suitably brief – a few circuits and bumps, three-engined landings and overshoots, day and night, then a high level bombing detail, half-an-hour of what was called 'fighter affiliation' – practising evasive action with a Spitfire from Kirton-in-Lindsey as a 'playmate', and a six-hour night cross-country. That, incidentally, was the closest we got to a proper operation.

It may surprise one or two of you to know that the first time I took off in a fully-laden Lancaster was on my first operation. That was to Cologne. It took a little longer to get unstuck from the runway than the Lancasters at Blyton had, and the rate of climb was noticeably less.

In fact, those last few thousand feet up to 20,000 were always hard to climb on warm summer nights. Later in the tour, I found a little trick: bang ten degrees of flap down, bounce up a hundred feet, and milk the flap off so gently that the aircraft didn't notice. And keep on doing that until it didn't work any more. No one taught me that at HCU. But there were lots of little things you had to learn the hard way, as you went along: don't eat baked

beans; don't drink too much liquid; allow no chatter on the intercom; don't look into searchlight beams; ignore scarecrow flares; forget the standard corkscrew and turn straight into fighters if they're coming at you.

Some years ago a German night-fighter pilot told me about his first kill. He had a four-engined bomber nicely lined up in front of him (it was of course a Halifax), when it dived to the left and disappeared. He was sitting there, baffled, wondering where it was, when it loomed up again, right into his sights. That unhappy pilot was flying the standard corkscrew.

By the time my first tour was over, No 1 Group was getting a grip on heavy bomber training. Some of us were sent to a Flying Instructor School, became QFIs and formed an instructors' flight at Sandtoft (known in 1 Group as Prangtoft). All screened pilots had to fly with us and learn the standard patter and technique. It says a lot for those people – all of whom could fly the plane as well as I could – that none of them ever told me to get stuffed.

Summing up, my experience of wartime flying training was that it was excellent up to wings standard. (P)AFU was nugatory, OTU was fine because the Wellington was fine. Digressing for a moment, I should tell you that, in the States, General Arnold's men, with typical benevolence, had arranged a showing for us Brits in the base cinema of the RAF documentary *Target for Tonight*, and there I was at OTU, the captain of a bomber crew, roaring down the runway and up into the darkness, just like Percy Pickard in his 'F for Freddie'.

After OTU, as I've hinted, the system suffered from a shortage of qualified instructors. The employment of tour-expired pilots in the role was clearly expedient but not always satisfactory. That said, the whole process was extraordinarily thorough, with massive and unfailing administrative, technical and logistic support. I, for one, will always be grateful for that.

FRONT LINE OTU IN THE MIDDLE EAST

Air Marshal Sir Patrick Dunn

In Spring 1941 Germany's star was in the ascendant in a straight fight against Great Britain alone. Germany had swept up France and Western Europe: had not yet taken on Russia; and the Middle East seemed the prime objective.

Rommel had pushed us out of Libya, save for fortress Tobruk. We made a brave but futile effort to help Greece and been tumbled out of that country, through Crete, back to Egypt (May 2). We were threatened in Iraq but No 4 FTS held out: Syria had to be cleared of Vichy French and a German occupation prevented. Wavell and Longmore had a heavy task on their hands for which they had inadequate forces.

The Mediterranean was all but closed and supply came round the Cape save for an incipient aircraft reinforcement route by Takoradi (West Africa).

Under Longmore's command, in 1940, were twenty-nine squadrons of antique aircraft: a second line force. With so many obsolete types, shortage of replacements and spares caused rapid wastage. For the trickle of new aircraft there were no reserves or spares at all nor was pilot and other manpower being replaced sufficiently.

Longmore made abundantly clear that we were rapidly consuming reserves with no immediate prospect of replacement from the UK.

This was to continue to the beginning of 1942 and to be a profound misunderstanding between Cairo and London. It must have maddened the CAS to be addressed by the Prime Minister as follows:

> '… 1,000 aircraft and 17,000 personnel …. provide 30½ Squadrons, 395 operational types of which I presume 300 ready for action. In the disparity between this great mass of men and …. aircraft on charge and the fighting product available, *which is painfully marked both here and at home, lies the waste of RAF resources ….'*

A day or two later the Prime Minister addressed Longmore direct (about 12 Nov 40), declaring he was trying to speed up Hurricanes and other things:

> 'Pray report daily what you actually receive and how many you are able to put into action. I was astonished to find that you have nearly 1,000 aircraft and 1,000 pilots and 16,000 air personnel …. Pray report through Air Ministry any steps ….. to obtain more fighting

value from the immense mass of material and men under your command.'

The PM took no account of the running requirement for repairs, inspections, overhauls, aircraft awaiting spares, to be scrapped in crates, on the high seas, on the Takoradi route, etc.

Air Chief Marshal Sir Arthur Longmore was called home for a conference about 2nd May – when we were pouring out of Greece – and did not return.

Middle East was only a side-show for Germany, but it was the only theatre where axis and allied forces were visibly fighting one another. In Middle East eyes it was the No 1 struggle, and ME seemed to be criticised and not readily helped.

Smarting from the Prime Minister's blistering comments, the CinC, now Air Marshal Tedder, and his well experienced but rueful staff continued to make the best use of what they had, and to expand the Force as resources started to fill the long pipe-line.

There was a substantial number of qualified pilots already in the Command, as yet untrained for an operational role. Others were beginning to arrive from Australia, New Zealand, South Africa, Southern Rhodesia, our own No 4 FTS in Iraq, Free French and some other oddballs.

On 1st June 1941 No 71 (F)OTU was established at RAF Station, Ismailia, taking over the Fighter and Army Co-op, elements of 70 OCU, which, with the Bomber element moved off to Kenya and became a Bomber OCU.

The output was planned to be 30 per month: 40 hours each trainee, and to produce 1,200hrs plus some more for the instructors, a total of 50 staff and students, plus 600 NCO's and airmen. From memory I think 36 fighter aircraft.

Available at Ismailia on start-date were 7 Hurricanes: 3 Lysanders, 2 Wellesleys (one a dual), one Harvard and one or two unserviceable Magisters and Hawker Harts. 13 aircraft useable for the training to be given.

The first month produced 800hrs and turned out 38 pilots at about 20 hours apiece, but there were 11 aircraft accidents: three by instructors, (two by the same Free French instructor); eight by students (four by Free French and four RAF). 15 aircraft were allotted during the month which was ended with 13 serviceable and 15 unserviceable aircraft, usable for training.

Apart from the accidents which seemed horrendous, this seemed quite a good performance by 11 officers and 240 NCO's and airmen.

Additionally, a night readiness of two or three fighters was maintained on about twenty nights but the enemy never came. Our enemy was domestic; insufficient aircraft, senior NCOs, spares, airman tradesmen, tool kits, and only a trickle coming in.

In the month of July actual performance was 850 hors: 18 students trained: 10 accidents. July was found to be too hot for training: plastics melted, surfaces of aircraft were untouchable.

Total of 3 Tomahawks were allotted in August.

Specific performance not bad. 815 hours: 20 output: 26 officres. 375 NCOs/airmen.

Yugoslavs sent back home: Welcome to the Turks, (4) with their own Tomahawks.

Enemy action having a grave effect on output. Ismailia too easy to find in angle Suez Canal, Sweet Water Canal and Railway.

Town heavily attacked: labour deserts: no services: shops shut: dependents ordered into camp.

8th: Heavy attack on airfield: 13th Airfield blitzed: four waves. One barrack block destroyed: 4 UXBS.

12th Three hours alert but no attack.

13th Inspector General visits. Query, how good are Colonials (*sic*) sent us for training.

Airfield blitzed midnight: 4 a/c destroyed and numerous others peppered shrapnel. Gun post hit: one killed, all crew injured. Station had to call on OTU for clearing up.

27th 2 Barrack Blocks totally destroyed. Armoury, MT Section, Married Quarters all subject UXBs; 3 airmen killed.

Disperse to desert about three miles off: aircraft and personnel. Set up tented camp.

Maintenance and training coming to a standstill.

10 accidents: four by instructors: four by Yugosla^{v}s, one fatal. Only two by students.

In September work was badly held up by lack of typewriters …. damaged by enemy action!

3/9 Serviceability only 2 Hurricanes. Maintenance going to pieces: airmen now making sufficient effort to get to work. 100½ march to work tomorrow.

5/9 Airfield blitzed: my remaining three barrack blocks totally destroyed: many a/c destroyed: bombs on runway and airfield.

6/9 Clearing up: another raid aimed Abu Sueir: but one stick of four on my runway: 9 aircraft damaged. No flying but no human casualties.
10/9 Decision to leave Ismailia for Gordon's Tree (Khartoum).
12/9 Eight Tomahawks leave, four flown by Turks: all arrive at G. Tree.
Great enthusiasm to get away from Ismailia.

The flight from Egypt was as follows:
10/9 Reveille 0430: entrained 0800: off at 0830.
20/9 Embarked stern wheeler of the fleet which arrived too little and too late for General Gordon's trouble decades before.
26/9 Arrive Gordon's Tree.
Draft to bring up to Establishment – 245 men – on way.
Plain sailing from now on.

SIR JOHN GINGELL. It occurs to me that in a short summing up there are two things. The first is that we have talked about flying training, rightly because that was what was intended, and we talked about the enormous organisation that had to produce the aircrew who eventually flew operationally. You have to set that against the enormous operation to produce the ground crews without whom none of us would have been able to fly and that puts some sort of scale on the whole operation of flying training. The other thing which Henry Probert has just mentioned to me is that it would be very interesting to set against all that we have heard today, the manner in which the *Luftwaffe* set about the business of training its crews without access to overseas training airfields and lots of allies prepared to give us Arnold Schemes and all those things that went on in delectable places like South Africa. This is the sort of thing that at some stage we ought to look carefully at to get it all into proportion. I don't know if our society chairman feels this as well, having heard all the things that have been said today.

Now we have the presentation from CFS. Without bringing us up to date, and things have changed rather substantially, the whole exercise would be a little unreal.

HQ CFS PRESENTATION PILOT TRAINING 1945-92

Sqn Ldr M Wylie

At Kittyhawk, North Carolina, a coin was tossed to decide who would be the first man to fly. It is with some relief that today the Royal Air Force's selection procedure is a somewhat more complicated affair. Indeed only 10% of applicants are accepted for pilot training. Although the selection procedure has changed the aim of pilot training remains the same – 'To produce sufficient independent-minded pilots with the skills needed to meet the demands of the front line.' The following presentation is a history of pilot training from the end of the Second World War to date.

During WWII, pilot training for the Royal Air Force existed in Australia, New Zealand, South Africa, Southern Rhodesia, India, Canada, the USA and the United Kingdom. In 1992 only six pilots train outside the UK. This takes place in the USA as part of a Joint NATO Scheme.

Over 60 Flying Training Schools (FTSs) were once used, both Service and Civilian, which produced 15,000 pilots during 1945. Today, there are only seven FTSs in use covering all flying training up to 'wings' standard. In the last year only 164 students graduated.

It cost £10,000 during the war to train a pilot to front line standard. The equivalent pilot cost today is approaching £3M. Aircraft costs have also risen dramatically: a 1940's Spitfire cost some £20,000; today a Tornado costs £20M.

The accident rate in 1946 was nearly nine accidents per 10,000 hours. Today, the rate is one per 10,000 hours. This is due to advanced aircraft systems, far greater aircraft reliability and the attitude of the pilots, which starts at initial flying training.

Even in 1944 the Flying Training System had started to wind down, the ending of the war merely accelerated this process. The future requirements of the Service were still uncertain. Training continued with a mixture of EFTS grading and elementary flights, Service Flying Training Schools and units for pilots awaiting their OTU. In 1947, Training Command reshaped itself into a new peacetime format. All pre-entry training and most Elementary Flying Training Schools were handed over to the ready-formed Home Command. Basic and Advanced Flying Schools were split between 23 Group and 21 Group respectively.

23 Group had six FTSs, each with a capacity of 144 students. Students carried out a 12 month 'all through' basic training course of 60 hours on Tiger Moths and 120 hours on Harvards.

The Tiger Moth entered Service in 1931 and over 7,000 were introduced into the FT system. It provided initial training for most wartime pilots and is affectionately remembered.

One student was practising forced landings on a cold winters day and was not progressing too well. He claimed to his instructor he was freezing and this was the reason for him being rather 'ham-footed'. The instructor was not pleased and so landed the aircraft and told the student to get out. The student thought he was going to walk back to base. However, he was ordered to remove his boots, put them in the storage area and jump back in. The student's feet were frozen but the forced landings were far less heavy on the rudder pedals!

One grading school found that the wings of their Tiger Moths had been slashed by mystery saboteurs. An investigation followed and it was noticed that it was only the underneath of the top wing that was being damaged. The culprits – the students who patrolled the airfield at night – were very keen to look into the new aircraft they were going to fly; unfortunately as they did so, the bayonets attached to their rifles slung over their shoulders were quietly cutting away the fabric of the wing.

However, in 1947, after 16 years in service, it was beginning to show signs of old age and a replacement was badly needed. The Harvard was originally bought as a training aircraft as a stop gap measure prior to the war, British aircraft manufacturing companies being heavily involved in the production of operational aircraft.

However, the Harvard had two main weaknesses as a training aircraft. The forward visibility from the front cockpit was very poor, giving the student problems in take-off, landing and taxying. It was also very noisy. However, the Harvard was regarded as a 'hot ship' by the Tiger Moth student pilots who could not wait to fly this more powerful aircraft.

On one occasion a student was authorised for some solo cross-country at night. However, in order to impress his girlfriend he picked her up on the taxiway, flew the trip and dropped her off before returning to the crewroom.

21 Group had training units at RAF Swinderby (Wellington), RAF Driffield (Mosquito) and RAF Finningley (Harvards, Oxfords and Spitfires). The introduction of the Advanced Flying Schools (AFS) in May 1947 represented a major change in training policy. Operational type aircraft were now needed on a large scale for pre-OTU training. Previously

the Advanced Flying Units (AFU) had operational aircraft which were used for familiarisation trips but the AFS was now an additional stage between the FTS, where the 'wings' course was completed and the OTU. These courses varied in length but generally lasted 2-3 months with 30-50 hours flying.

In 1948 a new pilot training scheme was introduced. The student pilot was to remain at the same training school to achieve his 'wings'. This all through training programme incorporated an all-weather policy and two new aircraft types would be used for the basic and advanced stages.

A replacement for the Tiger Moth was already being considered in 1943 when the Government put out a requirement for an economical, all-weather monoplane. The Percival Prentice, or 'Clockwork Mouse' as it became known, was chosen and deliveries started in 1947 for trials. RAF Feltwell became the first FTS to receive them for flying training in September 1948. It was originally designed as a three-seater aircraft; this would allow a second student pilot to sit in the back and glean information from his fellow student. However, the aircraft had nowhere near enough power to cope with the extra load and the idea was quickly dropped. Over 350 Prentices were produced but Percival were already researching into a new aircraft – the Provost –which in one of many formats would last for over 40 years.

The practice forced landing technique was an exercise that was carried out on many occasions. When carrying out this exercise it is necessary to warm the engine regularly so that it would respond when the overshoot was carried out.

> An instructor had taken control at a very low height and applied full power. The engine failed to respond and the Prentice sunk lower and lower into a cornfield. After what seemed a lifetime the engine burst back into life and the instructor climbed the aircraft away. Not a word was said between the two and the aircraft returned to RAF Syerston. As they taxied in they noticed that people were stopping to stare at them. It was not until they got out that they realised why – the undercarriage was stuffed with sheaves of corn!
>
> On another occasion a student had the misfortune to actually carry out a forced landing away from base. The instructor that was sent to pick him up spotted the aircraft parked in what appeared to be a very small field. However, he thought, 'If he can land there, so can I!' The instructor landed but could not stop in time and hit the end of the field, the aircraft ending up on its nose. When asked how he

managed to land in such a short space the student replied that he had actually landed two fields away but had bounced into this one.

The other trainer chosen was the Boulton Paul Balliol. Initially this was fitted with a single turboprop and so was the first single-engined turboprop aircraft used by the RAF. However, this new idea was dropped and the engine finally chosen was a de-rated Merlin. Although an order for 500 was originally placed, the jet engine was rapidly becoming commonplace and only 175 were produced. The only FTS to receive the Balliol was 7 FTS at RAF Cottesmore. Having originally intended to replace the Harvard, the Balliol was to serve alongside it until the early 1950s.

The late 1940s and early 1950s saw an expansion in Flying Training. The Korean situation, the Cold War beginning, the formation of NATO and the Berlin Blockade all had the affect of stimulating the growth of pilot training. Conscription had been re-introduced in 1947 and National Service aircrew were now being introduced to operational standards. The new requirement from the FTSs was three times the existing rate, of which 1,000 were National Service. These pilots were to have a basic flying training course at civilian flying schools on the De Havilland Chipmunk.

The 'Chippy' was introduced as a replacement for the Tiger Moths at the University Air Squadrons (UAS) in 1950. Its robust nature and handling characteristics are such that although it was replaced on the UASs in 1973 it is still in use at RAF Swinderby on the Elementary Flying Training Squadron (EFTS). EFTS was formed in 1985 from the Flying Selection School (FSS) which had started in 1979.

At one particular UAS the callsign used was 'India' followed by a number. One student, when solo one afternoon, became 'temporarily unaware of his position.' He managed to speak to Air Traffic and was given a heading. In an attempt to find out more information, the controller asked:

'Are you on instruments?'

Silence.

'Lost student, are you on instruments?'

'Negative.' came the reply 'I'm on a parachute.'

The by now infuriated controller then asked:

'Lost student – are you IMC – India Mike Charlie?

Quick as a flash the student brightly replied:

'Negative – I'm India 46!'

The aircraft landed safely.

Grading was to be re-introduced, initially for National Service aircrew only but later for regular entrants as well. To cope with this expansion the whole Command structure was reorganised:

54 Group was re-formed to take over initial training.

23 Group were responsible for Basic Flying Training.

1 FTS was re-formed at RAF Oakington and five AFTSs were set up to cater for the National Service aircrew.

25 Group re-formed in 1951 as an all jet Group with six AFSs to operate the AFTSs and Refresher Units taking over responsibility from 21 Group which became more concerned with training other aircrew.

By the end of 1952 the output of pilots from Training Command was the greatest it had been since 1941. 1,387 pilots were trained compared to the planned figure of 400. This increase in output meant that the front-line was filled faster than anticipated and a rundown of the training organisation began.

The grading system was again closed in February 1953. Even in four years the Training Command was a very different-styled organisation. During the Korean War, two new aircraft were being introduced. It was no longer practical, or possible, to operate the all through training system at individual stations so 23 Group FTSs became basic training units and 25 Group FTSs continued with the second stage of training.

The basic trainer which was selected to replace the Prentice was the 550hp/200mph Provost. At the time of introduction many instructors feared that the aircraft would be too powerful for *ab initio* student pilots. However, it was soon to be recognised as a delight to fly and a first class trainer in all respects. Many could not believe it came from the same factory as the 'Clockwork Mouse'! The side-by-side seating arrangement proved to be a life-saver on one occasion.

A foreign student was carrying out circuits and, whilst attempting a roller landing, did not apply enough power to get airborne. The student then froze and refused to respond to the instructor's orders. As the aircraft was heading towards the ATC tower the instructor took dramatic action; he punched the student! This had the desired effect; the instructor took control and just missed the tower.

Another couple had a very lucky escape during the 'circuit

bashing' stage. After one particularly heavy landing the instructor asked if everything was OK on the student's side. 'Wing looks a bit wrinkled, Sir' came the nonchalant reply. After landing, the wing was examined and found to have moved one inch; it was hanging on only by the skin.

Coupled with the introduction of the Provost, the jet era finally reached the flying training world with the Vampire T11 being introduced in 1954 at 5 FTS, RAF Oakington (1 FTS moving to RAF Moreton-on-the-Marsh). This allowed pilots to gain their wings on jet-aircraft and also gave an early indication of a pilot's suitability for a fast jet squadron. Over 3,000 pilots graduated on 'Vamps'; dual trips being carried out on the Mk 11, and solos in the single seat Mks 5 and 9.

The transition to jet flying brought with it new problems as one student found:

> After carrying out a high level sortie he called for recovery but was unable to raise RAF Valley on the R/T. He descended through cloud and breaking out over the sea duly headed East. As the fuel tanks started to run dry he reached land and came to rest at an unfamiliar airfield. He had flown into a jetstream, mistaken the North Sea for the Irish Sea and had landed in Belgium!

Throughout all these early changes the Central Flying School (CFS) had re-formed and taken an active role in these major advances in flying training. CFS was revived in 1946 at the orders of the Air Ministry. Group Captain Britton and his staff of No 7 Flying Instructor School moved to RAF Little Rissington on 3 May. Although it had to adapt itself to continually changing requirements and to rapid scientific developments CFS maintained the aims laid down by the first Commandant, Capt Godfrey Paine, RN, in the early days at Upavon and followed the principles evolved by Maj Smith-Barry at Gosport.

The introduction of the Provost/Vampire training system started only after the first production batch of Provosts had been thoroughly tested at RAF South Cerney, CFS's airfield for the basic trainer. RAF Little Rissington remained the station for the advanced Vampire trainer.

CFS continued to expand with a helicopter development flight being introduced in 1954 at Middle Wallop which was soon to transfer to RAF South Cerney. In 1955 the Jet Provost T1 was introduced for testing at CFS. This was to become a milestone in the history of flying training.

It was in 1952 that the idea to fit a jet engine into the Provost airframe

was first mooted. This was to become the basic trainer and remain in service for the next three years. As had happened when the Provost replaced the Prentice, it was felt that *ab initio* students would not be able to cope with the more powerful aircraft. However, a trial at 2 FTS, RAF Hullavington where two courses ran alongside each other, one on the Piston Provost, the other on the JP, proved a success. In 1959 the JP, now the T3 variant, entered service, again at 2 FTS which had now moved to RAF Syerston. Periodic upgrading of the JP continued, with the T4 first entering service in 1960. This featured a 2,500 lb thrust engine and it was found that this increase in power actually enabled the pupils to achieve a higher standard of flying! In 1967 the T4 was upgraded to the T5, the adding of the pressurised cabin allowing high altitude training. The T3 and T5 were now used alongside each other. In early 1972 both types received an avionics upgrade and were re-named T3A and T5A. The incorporation of VOR/DME/ILS allowed a more comprehensive instrument and instrument procedure training system to be carried out at the earliest stage of flying training.

An aircraft that flies for over 40 years builds up an enormous array of incidents.

> On one occasion a foreign student had just been taught steep turns. That afternoon he was briefed for a solo trip; his instructor told him not to carry out the turns that he had learned that morning. The student took off and proceeded to fly in a straight line; after travelling through two Air Traffic Zones, his instructor was sent to the tower to ask the student what he was doing. The student replied that he was told that he was not authorised to carry out any turns and could only fly in a straight line!

Due to the new aircraft operating higher and faster than their predecessors, an area free of air traffic control restrictions was needed and so a migration of FTSs began to the north-east of England, with 7 FTS at RAF Leeming and 3 FTS at RAF Church Fenton becoming operational.

Initially Jet Provost students completed their training on the Vampire where they were awarded their ‘wings’. However, in 1962 the first all-through Jet Provost course was completed and thereafter pilots were awarded their wings at the end of the Jet Provost stage of training. After this pilots went to Advanced Flying Training at 5 FTS, RAF Oakington, equipped with the Varsity, or to 4 FTS, RAF Valley, where the newly introduced Gnat, and later the Hunter, were used to train pilots for Bomber

and Fighter Commands.

The Gnat was originally designed as a lightweight fighter but the RAF saw it as an ideal twin-seater advanced trainer. The tandem-seat approach was accepted for advanced flying as it was felt that the student pilots did not need to be as closely watched and it would prepare them for front line service. The Gnat, slightly unstable in flight, had great manoeuvrability. However, its range was limited and the serviceability, which was originally hoped to be good, was poor with over 30% becoming unserviceable by lunchtime on a normal day. Over 100 Gnats were built and were used by 4 FTS and CFS.

The Varsity first flew in 1951 and pilots new to the multi-engined environment adapted quickly during the 10 week course. The aircraft was introduced at a number of units, giving advanced instruction to pilots, navigators and bomb-aimers. From August 1960, 4 FTS at RAF Valley had a small number of Varsities for training pilots bound for the Britannia and Shackleton aircraft. This tasking later transferred to RAF Oakington.

The Hunter T7 was introduced in 1967 to 4 FTS, RAF Valley, to give advanced pilot tuition alongside the Gnat trainer, and was later used by the two Tactical Weapons Units (TWU) at RAF Brawdy and RAF Chivenor. When RAF Chivenor closed, the TWU moved to RAF Lossiemouth, returning to RAF Chivenor when that station re-opened.

In 1965 the Initial Training School at RAF South Cerney had started to give flying instruction on Chipmunks, prior to the students attending an FTS. The Chipmunk squadron at RAF South Cerney later moved to RAF Church Fenton and was re-named the Primary Flying Squadron (PFS). The PFS continued until 1974 when the squadron was disbanded in favour of the ‘all-jet’ policy. The policy marked another new era for flying training; the policy makers believed that the ‘ideal’ training pattern should comprise basic training, after which a student would ‘streamed’ into one of three routes: fast jet, multi-engined, or rotary for their advanced training..

This new approach significantly reduced the number of hours required to train a pilot without reducing the standard of those that graduated. This was because the training aircraft were more effective and more emphasis was placed on simulators and instrument trainers.

In 1973, three new aircraft entered service.

The Chipmunk was replaced at the UASs by the Bulldog T1 which is also in service with the Royal Navy Elementary Flying Training School at RAF Topcliffe. Built by Scottish Aviation, the Bulldog is a fully aerobatic side-by-side two seat aircraft. It has excellent visibility and better

performance than the Chipmunk.

The Jetstream was introduced to replace the Varsity as the multi-engined trainer. This twin-engined aircraft is an ideal trainer for the multi-engined front line and was used initially by 5 FTS. However, by January 1975 this FTS was disbanded due to the reduction of the front-line multi-engined fleet. In 1976 the Jetstream was re-introduced by 3 FTS at RAF Leeming and in 1979, 6 FTS, RAF Finningley received their first Jetstream. 6 FTS is now the only Multi-Engined Training School.

The Gazelle was first flown at CFS in 1973 and replaced the Sioux and Whirlwind. It was regarded as a delight to fly and was light and responsive to pilot control. This became a problem as the advanced student could not be 'loaded' and so the Wessex was introduced to help in this matter. The Gazelle is also used by 2 FTS, RAF Shawbury.

By the mid-'70s there were only 2 BFTSs, 1 FTS at RAF Linton-on-Ouse and the RAF College. In 1978, it was realised that the two schools could not cope with the load and RAF Church Fenton, previously the RAF Linton RLG, was upgraded into a BFTS and named 7 FTS.

Also by the mid-'70s the Gnat was becoming outdated. The Hawker Siddeley Hawk was found to be a most suitable replacement and entered service at 4 FTS, RAF Valley in 1976. The Hawk had excellent performance characteristics and the engine is so economical that a full sortie can be carried out with enough fuel to divert to RAF Lossiemouth. So impressive was the Hawk that it was used at the TWU at RAF Brawdy in 1978, and later at RAF Chivenor, replacing the Hunter.

At the same time, the award of wings was delayed to after the completion of the advanced stage of flying training. This policy has remained to date and pilots receive their wings as they graduate from AFT.

The flying training syllabus has remained fairly standard throughout the 1980s but the end of the decade saw the introduction of the Tucano. By the mid-'80s the JP was reaching the end of its service and a new, more economical aircraft was needed. Unlike the case of the first turboprop training aircraft, the Balliol, some 40 years earlier whose engine was changed for a piston, the Tucano entered service with a turboprop powerplant. The aircraft has tandem seating so making the progression onto the Hawk as smooth as possible. The first FTS to receive the Tucano in 1989 was 7 FTS at RAF Church Fenton and, after the overcoming the inevitable teething problems that occur with a new type, it is proving to be a worthy successor to the JP. RAF Church Fenton closed in 1992, its tasking being taken over by both 1 FTS, RAF Linton-on-Ouse and the RAF

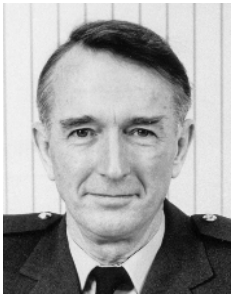
College.

The late 1980s also saw the arrival of female aircrew at BFT, although they had been accepted at UAS for flying training since late 1985. As they have progressed through the training system, the barriers to their future employment have been removed. There are now female co-pilots on operational squadrons and one girl attending TWU. As yet we have no female QFIs.

In September 1992 the Hawk course changed. To save hours and prevent duplication of sorties, the AFT and TWU elements were combined into a new 100-hour course. This new phase of advanced training will be carried out in parallel at both RAF Valley and RAF Chivenor (RAF Brawdy having closed in August of this year).

Flying Training has never remained constant. It has been continually changing due to the demands placed on it by the front line. The selection procedure, however, has still produced potential pilots, now both male and female, of a high calibre and determination. The training techniques used are still based on Smith-Barry's principles which John Taylor covered this morning. These principles are also reflected in the selection of instructors. Smith-Barry claimed that the mental attitude towards flying of an instructor is reflected in all the pilots he turns out – that is as true today as it was then.

We believe that the RAF Flying Training system is the best system in the world. It is a testament to the system that many other air forces have based their training on that used by the RAF. The Service of today has to be effective and flexible; with the correct aircraft and current training techniques the RAF can meet any challenges that it is set.



Air Chief Marshal Sir John Gingell CBE KCB KCVO

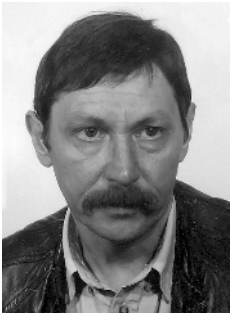
Sir John Gingell began flying in 1943 – a conventional first solo in a Tiger Moth. There followed a slow progression via Canada towards Basic and Advanced Training in the USA completed just in time to arrive back in Liverpool on VE-Day. A transfer to the FAA provided stimulating experience on Fireflies and Seafires, but demobilisation soon came. Five years in industry then led to a return to the RAF in 1951.

At that time Mosquito PR aircraft provided inviting prospects with 58 Sqn, and the CFS Course opened the way to the Canberra PR OCU as an instructor. Later, command of No 27 Vulcan (Blue Steel) Squadron filled out most of his productive flying time.

Staff College inevitably intruded and pointed the way happily to Air Planning in Cyprus. Tours as MA to the Chairman of the Military Committee at NATO HQ, as AOA RAF Germany and then as the last AOC 23 Group led to a central staff job as ACOS Policy.

In his final years in the Service he was AMP for two years followed by a short spell as CinC Support Command before a last appointment as Deputy CinC Allied Forces Central Europe.

Following his retirement he became Gentleman Usher of the Black Rod – a post he held for seven years.



Michael Paris

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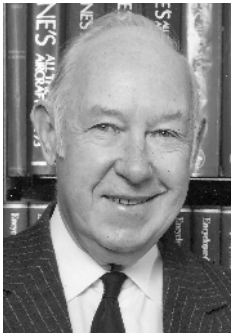
Recent publications: *The Novels of World War Two* (1990) and *Winged Warfare: The Literature and Theory* of *Aerial Warfare in Britain* (1992).

Now working on a social history of the RAF and a book on aviation and popular cinema.



John W R Taylor OBE FRAeS FRHistS AFAIAA

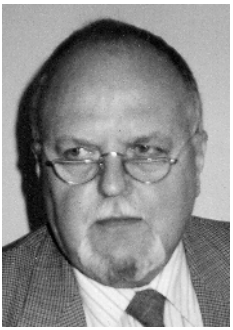
Born 8 June 1922, Ely, Cambridgeshire. Invited by Mr (later Sir) Sydney Camm to join Design Office, Hawker Aircraft Ltd, Kingston upon Thames, March 1941. Responsible for drawings of engine armour, bulletproof windscreen and part of 40mm gun fairings for Hurricane IID; all drawings to convert Typhoon into a radar equipped night fighter; for 'productionising' Tempest V at Langley factory; for producing first service bulletins which enabled fighters to be modified at bases rather than returned to factory; for writing pilot's notes, descriptive, servicing and repair manuals for Tempest, Fury, Sea Fury series of fighters. Left Hawkers September 1947 to become Editorial Publicity Officer of The Fairey Aviation Group. Resigned to follow career as writer and consultant. Professional writing career had begun with features for *The Aeroplane* and *The Aeroplane Spotter* in first months of 1943. Became Air Correspondent of *Meccano Magazine* (1944 until 1972), and contributor on policy and technical matters to the *Royal Air Forces Quarterly/Air Power*. This led to special commissions, including compilation of *Commonwealth Technical Training Year* booklet and the standard RAF recruiting booklet *Into the Seventies with the Royal Air Force.* In 1955 was appointed Consultant Editor of new *AirBP* magazine on behalf of British Petroleum. First book, a history of the Spitfire fighter written on behalf of the Supermarine company (with Maurice Allward), was published in 1946. Compiled first of 26 annual editions of *Aircraft Annual* for Ian Allan Ltd in 1949, and first of 29 annual editions of *Civil Aircraft Markings* (with Gordon Swanborough) for same publisher in 1950. Produced more than 100 books for Ian Allan, including series of aircraft recognition manuals based on practical experience as wartime factory defence anti-aircraft machine-gunner and subsequent 15 years as a Post Instructor in the Royal Observer Corps.

Invited by Editor of *Jane's All the World's Aircraft*, Leonard Bridgman, to become his Assistant Compiler on leaving industry in 1955. Was appointed Editor immediately after publication of the 50th Year edition in December 1959. Editor Emeritus 1990. Total of books published now 229. Awarded C P Robertson Memorial Trophy, 1959; Member, French *Academie Nationale de l'Air et de l'Espace*; Liveryman of The Guild of Air Pilots and Air Navigators; hon. member, RAF Central flying School

Association; Awarded OBE, 1991; Received Lauren D Lyman Award of the international Aviation/Space Writers Association (first non-American recipient), 1991.

Group Captain Hans Neubroch OBE FBIM

Commissioned as one of the last observers in 1943, Neubroch was retained in Canada as a navigation instructor. The end of the war saw him in 8 (PFF) Group, Bomber Command. He then took a pilot's course and served with 35 Squadron in Bomber Command (Lancasters and Lincolns), and as CFI at Cambridge University Air Squadron. In the 1960s he commanded 35 Squadron (Canberras) and RAF Wattisham (Lightnings), before becoming Group Captain Operations at 11 Group. Later he was the senior British officer at SEATO, Bangkok, and served on arms control duties at SHAPE and in Vienna. Neubroch is a graduate of the Central Flying School, the RAF Staff College and the RN War College, and served on the Directing Staff of the Joint Services Staff College. When the RAF Historical Society was formed he became its first Secretary.



Dr Tony Mansell

Tony Mansell graduated in chemistry at Manchester University and did research for his doctorate there. During his career as a university teacher he has migrated from pure science into the territory of the history of science within education. In addition to scientific papers and a book, he has published work on scientific education in the 19th Century with particular reference to the public schools; on the history of biological education in the universities, and on the place of science in the medical curricula of London University and the Royal Colleges of Physicians and Surgeons of England around the turn of this century. He is presently writing a paper on the Royal Indian Engineering College, which trained civil engineers for the Indian Public Works Department in the days of the Raj. However, his major

current work, which is nearing completion, is an analysis of the origins and deployment of pilots in the Battle of Britain. He was led to it by a wish to explore an historical question of the type once posed by Sir Lewis Namier – 'Don't ask what the guys did, ask who the guys were'. He has just taken early retirement from a Senior Lectureship at King's College, University of London, and has been appointed as a Senior Visiting Research Fellow there.

Edgar L Spridgeon

Born in Peterborough in March 1920 – in a house which later gave a distant 'grand-stand view' of No 7 SFTS.

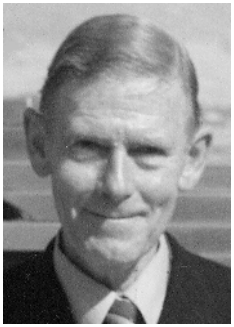
In 1939 was in the Post Office Engineering Department dealing with Telecommunications for the Services and therefore in a 'Reserved Occupation'. In February 1941 the Home Office published an Order releasing Telecommunication Engineers (and Policemen) to volunteer for service in the Royal Air Force as pilots or observers in the RAFVR.

Immediately volunteered and was called to the colours in August 1941. After ACRC, No 2 ITW Cambridge, No 22 EFTS, Cambridge, went to the USA for training in the 'Arnold Scheme'. Graduated as a pilot in August 1942 and was selected to remain in the USAAF as an instructor.

On return to the UK in July 1943 was told of a shortage of instructors and would have to do more. No 7 (P)AFU, Peterborough, No 2 FIS, Montrose, back to Peterborough and then back to Montrose on the staff of 2 FIS as an instructor and Flight Commander, where an Al Category as an instructor was awarded.

On the closing of 2 FIS in 1945 was again posted to Peterborough which was by then No 7 SFTS again. Soon after the Unit moved to Kirton-in-Lindsey, was 'demobilised' in accordance with the Home Office Order to return to Telecommunication.

Awarded the King's Commendation for Valuable Service in the Air. In 1948, resigned from the Civil Service and joined a Peterborough Machine Tool Manufacturer.



Air Vice-Marshal A D Dick CB CBE AFC MA FRAeS

Air Vice-Marshal David Dick joined the RAF in 1942 and trained as a pilot in India. Commissioned in 1943, he served first as a flying instructor; after OTU he served on 30 Squadron until the end of the war, and flew P-47 Thunderbolts over Burma. After the war he went up to Cambridge where he flew with the UAS and gained a degree in Mechanical Sciences, rejoining the RAF in 1950. After two years on the staff at CFS, mostly flying Meteors, he completed the ETPS Course, followed in 1954 by three years on 'A' Squadron at A&AEE Boscombe Down, flying all of the (then) new jet fighters. Six years on the ground – three on Bloodhound trials at North Coates, and three at Staff College, Andover, was followed by command of 207 Squadron (Valiants). In 1964 he returned to Boscombe Down as Group Captain, Superintendent of Flying, until moving in 1968 to CTTO for two years. IDC in 1970 led to four years in Whitehall – DD Air Plans followed by three years as DOR 1. After briefly returning to Boscombe Down as Commandant, in 1975 his final three years were as Deputy Controller Aircraft (C) in MOD(PE).

Flight Lieutenant Peter Jacobs RAF

Peter Jacobs was born near Southampton in 1958 and joined the RAF in 1977 as a technician apprentice. On completion of training he was posted to Brize Norton as a junior technician before being selected for training as a navigator in 1980.

Commissioned at Cranwell in March 1981, Peter was posted to 6 FTS at Finningley and on completion of training was posted to the F-4 Phantom at Coningsby. He served four years with 29 Squadron in the Air Defence role including a tour with 23 Squadron in the Falkland Islands.

At the end of 1986 Peter was posted back to 6 FTS as an Air Navigation Instructor teaching advanced low level navigation in the Dominie. During the last year of his tour he was the Air Defence specialist in designing the new navigator training course which has recently been introduced at Finningley.

At the beginning of 1990, Peter returned to Coningsby as a navigator instructor on the Tornado F3 with 229 Operational Conversation Unit. With the recent 'Options for Change' and the re-numbering of some squadrons within the RAF, 229 OCU has now become 56 Squadron where Peter is still serving. He has currently some 2,000 hours flying, all of which are in the air defence and low level environment.

Married with two children, Peter lives in Lincoln. His hobbies include writing and researching and is the co-author of the recently published book *The Six Year Offensive*. Now a squadron leader at Farnborough.

Squadron Leader J A L Currie DFC LGSM RAF (ret'd)

Born Sheffield, 7 December 1921. Educated Lower School of John Lyon, Harrow 1933-39.

Served in RAF as GD Pilot, 1 September 1941 to 7 December 1964, including wartime operational tours on Lancaster (12 and 626 Squadrons) and Mosquito (1409 Met Flight PFF). Awarded CinC's Commendation August 1943, Distinguished Flying Cross February 1944; Qualified Flying Instructor March 1944.

Civil Defence Officer, Nottinghamshire County Council, 1965 until disbandment 1968.

Registrar, Arnold & Carlton College of Further Education 1969 to 1971.

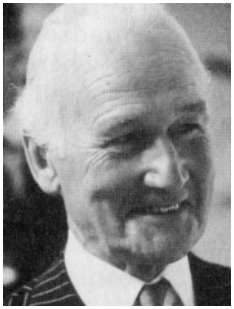
Air Display Director 1972 to 1974.

Tutor, Home Defence College, Easingwold 1975 to 1987.

Member RAFA, ACA, Wickenby Register, 44 Sqn Ass., RAF Club, Easingwold Golf Club.

Author *Lancaster Target* (New English Library 1978, Goodall Publications 1981), *Mosquito Victory* (Goodall 1983), *The Augsburg Raid* (Goodall 1987), *Wings Over Georgia* (Goodall 1989), *Round The Clock* (Random House, with Philip Kaplan), *Battle Under The Moon* (Goodall), *The Last Target* and *Flight Lieutenant* pending publication.

Presenter, narrator or writer of various BBC TV documentaries *(The Lancaster Legend, The Watchtower, The Augsburg Road, RAF Scampton, Girl in a Glider, From Hull Hell & Halifax)* and commercial documentary videos 1980 to date.



Air Marshal Sir Patrick Dunn KBE CB DFC FRAeS

1934-37, flying boats 201 Squadron; 1937-38, Flying Instructor 500 (County of Kent) RAuxAF; 1938, Long Range Development Unit; 1939, Flying Instructor (of Instructors), CFS Upavon; 1940-41, Sqn Ldr commanding 80(F) Squadron (Gladiators) ME, 274(F) Squadron (Hurricanes) ME; 1941, formed and Commanded 71 (F)OUT, ME (Ismalia & Sudan); 1942-44, Staff of CAS (Head of Overseas Operations (ME Branch)) intermittent duty as PSO to MRAF Lord Trenchard on overseas visits; 1944, Group Captain (Ops) 12 Group, Fighter Command; 1945-46, Group Captain Sector Commander, Fighter Command Coltishall; 1946-49, Group Captain DDPS, Air Ministry; 1949-50, Group Captain SASO, AHQ Malaya; 1951-52, Instructor NATO Defence College, Paris; 1953-56, Group Captain (Plans, Air Commodore (Ops) Fighter Command; 1953-58, ADC to HM the Queen; 1956-58, AOC and Commandant RAF Flying College, Manby; 1958-61, Deputy Air Secretary, Air Ministry; 1961-64, AOC 1 Group Bomber Command (Vulcans and Thor IRBM); 1965, AOC in C Flying Training Command (founded Red Arrows); 1966, Retired.

Since retirement several directorships and voluntary appointments including British Steel Corporation, Deputy Chairman British Eagle International Air Lines, Chairman Eagle Aircraft Services (Beechcraft in Britain), Managing Director of four Industrial Trading Estates and others. Voluntary Appointments include the committee of Governing Bodies of British Independent Schools.

Squadron Leader M D Wylie

Squadron Leader Michael Wylie joined the RAF in March 1966 as a cadet at the RAF College. After graduation and advanced training on the Varsity he was posted to Cyprus and served on 35 Sqn which equipped with the Vulcan aircraft. Returning to the UK in 1972 he completed a tour as a Flight Commander at the School of Recruit Training. A tour on the Canberra from 1975-77 was followed by QFI training and a tour as a Jet Provost instructor. Sqn Ldr Wylie was then

posted to the staff of CFS 1980-81 and then onto the HS 125. Another tour on the CFS staff was followed by a tour as a Squadron Commander at 1 FTS, again on the Jet Provost. From 1988 to1990 he served as an instructor at the RAF Staff College before being posted back to CFS as a staff officer. Married with three children his interests include golf, computers, and reading.

Air Commodore G L McRobbie RAF, Commandant Central Flying School

Air Commodore McRobbie was born in Edinburgh in 1944 and joined the Royal Air Force at RAF South Cerney straight from school in 1962. Following flying training his first tour was an 18 month secondment to the Sultan of Oman's Air Force prior to attending the Central Flying School, RAF Little Rissington, in 1967. He then moved to RAF Leeming as a Qualified Flying Instructor on the Jet Provost basic trainer. A return to operational flying started in 1971 with conversion to Hunter and Buccaneer aircraft, prior to consecutive tours on XV and 16 Squadrons, at RAF Laarbruch, in the Strike/Attack Role. In 1976 he became Officer Commanding Universities of Glasgow and Strathclyde Air Squadron. This tour was succeeded by attendance at the RAF Staff College, Bracknell in 1978. Promoted to wing commander in 1979, there followed Tornado GR1 staff tours at the Ministry of Defence and at Headquarters Strike Command until 1984, when he took command of the Tornado Weapons Conversion Unit, at RAF Honington. A further ground tour followed with the RAF Presentation Team, as a group captain, prior to becoming Station Commander at RAF Laarbruch in 1988. Air Commodore McRobbie next moved to Greenwich and joined the staff on the Joint Service Defence College. A year later, in October 1991, he took up his appointment as Commandant CFS.

During his career Air Commodore McRobbie has been involved in introducing the Buccaneer to the overland role and also the Tornado GR1's introduction to service. More recently, as Deputy Air Commander, he set up the Air Headquarters in Riyadh during Operation GRANBY.

A home computer enthusiast, Air Commodore McRobbie is married to Pamela and they have two daughters; Karen is a Health Visitor working in Manchester where she graduated from the university, whilst Jane is reading Sociology at Liverpool University.

COMMITTEE MEMBER PROFILES

Air Vice-Marshal F D G Clark CBE BA

David Clark joined the Royal Air Force in 1953 on a short service commission as an Education Officer after reading Geography at the University College of the South West, Exeter and doing three years post-graduate research on the historical geography of the Cornish Ports. His first tour was as an instructor at the RAF OCTU Jurby in the Isle of Man until 1956 when he transferred to a permanent commission in the GD Branch. He was awarded his 'wings' in 1959 and served as a day fighter ground attack pilot on Hunters in RAF Germany with 14 Squadron until 1962. On his return to England he qualified as a flying instructor and became a Flight Commander flying Jet Provosts at the Royal Air Force College, Cranwell. In 1963 he was promoted squadron leader and served for three years as Station Commander RAF Woodvale and Officer Commanding the University of Liverpool Air Squadron where he was awarded the OBE. In 1969 he was promoted wing commander and posted to the Joint Services Staff College at Latimer and then to RAF Linton on Ouse as Chief Flying Instructor at No 1 FTS where he was awarded the Queen's Commendation for Valuable Services in the Air. He returned to Latimer in 1972 as a JSSC instructor for two years before being promoted to group captain in 1973 and going as Station Commander to RAF Masirah in the Oman. He returned to the MOD as a member of the Defence Policy Staff C Team in 1975. He was promoted air commodore in 1976 and served as Director of Air Plans for three years. In 1979 he was appointed CBE and went to the Royal College of Defence Studies. On leaving Belgrave Square he went back to Latimer as the Commandant of the National Defence College from 1980 to 1981. In 1982 he was posted to RAF Support Command as the Air Officer Commanding Training Units where he learned to fly helicopters and ran in the inter-services marathon. He returned to the MOD in 1983 for his last tour in the Royal air Force as Assistant Chief of Air Staff (Policy). On leaving the service in 1984 he served as Military Deputy to the Head of Defence Sales until 1987. This was followed by a three-year contract as a member of the Policy Complaints Authority. AVM Clark is now engaged on a three-year course to qualify as a teacher of the Alexander Technique. He is married with two sons. The elder son, Rupert, was a Tornado pilot on 15 Squadron during the Gulf War and is now

serving as a Hawk QFI at RAF Valley. Golf and Bristol cars absorb most of the AVM's spare time and money and he still runs in the London Marathon when his entry is accepted.

Group Captain J C Ainsworth CEng MRAeS

Born 1926 in Wembley and educated at Latymer Upper School, Joe Ainsworth enlisted in the Royal Air Force in 1943 as an aircraft apprentice. Graduating from Halton as a fitter armourer in 1945, he serviced aircraft armament in Britain and the Middle East and worked on experimental aircraft torpedoes before being selected in 1951 to join the Guided Weapons Trials Division at RAE Farnborough as one of the first airmen to work with guided weapons.

Commissioned in the Engineer Branch in 1954, he studied Electrical Engineering at Henlow, then was Electrical & Instrument Officer at the Central Signals Establishment before returning to Henlow for the post-graduate Advanced Weapons Course. While a missile systems project officer at the Central Servicing Development Establishment he was selected to take part in the stillborn Skybolt trials. After Staff College in 1964 and a brief involvement in the first European space launch programme he spent three years on exchange with the USAF at Wright-Patterson AFB, Ohio, as a Branch Chief and rocket propulsion specialist. He attended the Joint Services Staff College in 1969, then commanded the Engineering Wing at No 1 FTS. After a year flying with the Inspectorate of Radio Services as the 'golden voice of IRIS' he was promoted group captain and spent six months in MOD as a Deputy Director of Signals before transferring to the Procurement Executive to manage the XJ521 (Sky Flash) project through development to production.

On retiring from the RAF in 1977 he joined British Aerospace Dynamics sales and marketing, initially at Stevenage. In 1980 he moved to Hatfield as an Executive to lead the strike weapons sales team which won Sea Skua and Sea Eagle sales worldwide. Before finally retiring in 1990 he represented Dynamics' interests in the USA as a Vice-President of BAe Inc, based in Washington.

Since retiring he has joined the Council of the Halton Aircraft Apprentices Association and edits the Association Newsletter. He has a special interest in the history of Halton and of the apprentice scheme.

Addendum

This script was not delivered due to the author's ill-health. It is. however, of particular interest and is therefore included here.

THE TRAINING OF A BOMBER PILOT 1943

John Chatterton

I had been piloting a Lancaster for over two months before I went solo on my Austin Seven. We still used horses on the farm in those days and there were not many cars about. Mentioning this to a friend forty years later he said he has always been amazed how boys of twenty could so calmly take into their stride the complicated business of flying a heavy bomber. It made me realise that our pilot training had been quite well planned, and having managed the first moderately simple hurdle, the remaining sequence, though each harder than the last, was never so dauntingly impossible that we would not expect to overcome it. I myself was not a 'natural pilot', and usually found that the change up to the next aircraft was hard work, but with one exception the instructors were a patient and forgiving body of men who managed to keep me progressing with an 'average' assessment.

So the New Year 1943 found me, with my brand new wings, on a troopship between Halifax Nova Scotia and Gourock on the Clyde, looking forward to the next step and, although trained on Harvards, most likely to find myself destined for bombers. There was always a holding period between courses, which became more prolonged later as the supply of trained aircrew outstripped the losses, but in early 1943 we still chafed at the 2½ months that were spent doing Army exercises on the Pannal Ash Golf Course near Harrogate and a 'commando' course at Whitley Bay where the sea was quite cold before breakfast.

The last week in March found me at No 6 (P)AFU ((Pilot) Advanced Flying Unit) at Little Rissington doing the ground school for conversion to the twin-engined Oxford, and flying started at one of its satellites, Chipping Norton, in the first week in April. Well away from the fighter airfields in the south and the bomber stations further north, this part of the country abounded with training airfields. What a contrast to the blue skies of Arizona where we flew every day with no thought of the weather, where the next turning point on a cross-country could be seen from miles away, and night navigation was made simple by the dazzling street lights. Here in blacked-out Britain it was very easy to get lost on a dark night, and come to

think of it, not all that difficult to get lost on a cloudy, rainy day. Thank goodness for the railways, which together with a few rivers and distinctively shaped woods, (one near Buckingham with a circular hole in the middle was a favourite) got me back to the nondescript little grass field that was Chipping Norton.

I spent two months on the Oxford flying 50 hours dual and 70 solo, and during this time went to two other airfields for other duties. One was Pershore, where I spent an intensive week solidly flying 10½ hours of Standard Beam Approach, numbingly boring, but which probably saved our lives a month later when our Whitley got lost in the Birmingham Balloon Barrage. The other airfield we worked from was Chedworth, which had runways and a lighting system for our 20 hrs night flying. Flying alone over the blacked out countryside was at first a very lonely and frightening experience until we could trust our ability to find the red 'pundits' that marked each airfield. These flashed two letters in Morse and as long as we had the pundit code list with us, we could get around fairly confidently except in the remoter areas which had no airfields.

One of the most important things we .learnt on twins was asymmetric flying and how to cope when losing an engine in various circumstances. In addition to the Beam Course we did quite a lot of instrument flying and duplicated all the exercises in the Link Trainer where I got in 15 hrs.

I now had a total of 320 flying hours (120 on twins) and the next step was OTU. (Operational Training Unit). On June 7 I was posted to Tilstock (formerly Whitchurch Heath) in Shropshire for a course on Whitleys and began to realise that we were getting a bit nearer to the sharp end of the war. These aircraft had been front line bombers the previous year and after the Oxford felt really heavy and purposeful. Future friends in No 5 Group (Bomber Command) were all trained on Wellingtons at this stage, presumably there were more available at this time. When comparing notes in later years it seemed to me that there were a lot more crashes at Wellington OTUs than on our Whitleys. OTUs were linked to their operational bomber groups and Whitley training often led to No 4 Group Halifax squadrons in Yorkshire. However No 81 OTU at Tilstock had instructors who had finished tours with Lanc squadrons in No 1 Group and they gave us the first intimation of our likely destination in North Lincs. I spent just over two months on Whitleys (7 June to 15 Aug) doing ground school at the parent Tilstock, and the rest flying at the satellite airfield, Sleap. This was, as the name suggested, a pleasant rural area near the market town of Wem, with sun-drenched fields and the Welsh mountains

blue in the distance after a shower; but work was real and earnest, the aeroplanes black and menacing, real bombers fresh from action the previous year. We began to feel part of the bomber world as we lumbered round the skies with sand-filled bombs and sometimes even full tanks. I did another 15 hours in the Link Trainer and 79 hours in the air, of which 15 was dual, and began to learn how to evade searchlights and fighters, drop practice bombs, feather an engine and fly on one, air-to-air firing, etc, etc, but the most important thing was that I became captain of a crew.

Experts in man management would today exclaim in horror at the casual attitude adopted by the Service in forming this band of individuals who would become knit closer than brothers in the task ahead. In a few cases I've heard that crewing was done arbitrarily by the Flight Commander putting up a list of names comprising one of each trade who then made the best of it as a team – often with outstanding success. The haphazard method used at 81 OTU was no more efficient but it did at least have an element of choice. During the three week's ground school, pilots, navigators, bomb aimers, wireless operators and gunners, trained mainly in their own trade groups, but in off duty hours spent a lot of time eyeing each other's behaviour in the Mess and outside, and making mental notes.

I can't remember exactly how many pilots there were in my course, probably about twenty, all sergeants, but unfortunately the twenty navigators who had been posted in with us were all officers so we did not come across them off-duty without a special effort. At the end of the time, we were given one day to sort ourselves out into crews, and I was feeling very helpless – after all the Nav was the key man, and the only two I had any experience of in our mixed exercises had failed to impress. I was told later by my navigator that they were all feeling the same, only for them it was more worrying, they had to pick a driver and to put their lives in his hands. As luck would have it, I had joined the RAF halfway through a University degree and probably had more practice in exam techniques than my peers, so I found my name (thoroughly undeserved) on the top of the ground school exam list. This was no indication of my ability in the air but one navigator, clutching at straws, evidently thought that for want of better evidence this might just be a promising clue, sought me out and rather diffidently asked if I was fixed up. It was flattering to be asked and I liked the look of him, accepted the offer gratefully and never had cause to regret it. It turned out that we had both been in the Services since 1940, I as an armourer on Blenheims waiting for the aircrew medical standards to be slightly relaxed, and he as a despatch rider in the Army abandoning his

motor cycle on the beach at Dunkirk

I had spent some hours in the train on the way to Tilstock with a couple of sergeants, a wireless operator and a bomb aimer. Both seemed reliable types and further contact during the next few weeks had not changed my mind, so I asked them to join me. The Wop, a Dundee Scot, knew another Scot who was a gunner so brought him along and Lo, we had a crew of five, the number required for the Whitley. Later events proved that I had made a good choice with the two Scots who proved to be worth their weight in gold, calm and resourceful under stress, cheerful and willing at all times. With the BA however I had made a mistake! I was impressed by his ability and competence as a bomb aimer and the way he took in his stride all the little infuriating stupidities that the Service flung at us from time to time. He had joined the RAF as a boy entrant and knew all the ropes. Unfortunately, as time went by a worse side of his character seemed to develop into a 'clever dick' attitude with too much criticism and 'get some in' remarks particularly towards gunners who had become sergeants after only six months. None of this was manifest during training but a few months later on the squadron when we had done our first three ops it was beginning to niggle the crew, and alas, as skipper, I hadn't found the answer to it. A crew that was not a happy family had no future in the stress of battle so I was seriously thinking of asking the Wing Co. for a replacement when fate took a hand. We were standby crew (first reserve) one night when a bomb aimer was stricken with appendicitis at the last minute, so my man was taken and was shot down over Berlin. The ex-appendix man joined us when he recovered, fitted in well and we all got to the end of our tour very happily.

Although I was a sergeant and the Nav a Fg Off there was no question in our crew, or in any other, that the pilot was the skipper. It was a matter of common sense that the driver, whose reflexes in decision making could save or lose the aircraft, should be in charge. As with most bomber pilots at this time my commission came through after about a month on the squadron which meant that I was able to see more of the Nav in off duty hours in the Mess, but with the disadvantage that I no longer shared a Nissen hut with the rest of the crew.

It was quite normal for crews at the end of OTU to get fringe operational experience by penetrating 100 miles or so into France to drop propaganda leaflets (codenamed NICKEL) and sometimes when the occasion demanded, make up the numbers for a special raid into Germany itself, *viz* the 1,000 bomber raid on Cologne. The latter type could prove

expensive when screened instructors were lost with half trained crews.

Our crew did not get sent on a 'Nickel'. I can't remember why but think it was cancelled at the last minute.

In the *Bomber Command War Diaries* Martin Middlebrook shows that twenty-two OTUs did operations at some time, some of them got in more than 300 sorties: and the eight HCUs also helped out. None went over enemy territory after 1944 but often did diversionary sweeps over the North Sea in numbers to help spoof raids. At the time of D-Day, my FE and I were instructors at No 5 LFS and we prepared Lancasters on two occasions ready for take off if things had gone adversely.

But all this is in the future.

We said goodbye to the Whitley in mid August, had a week's leave, and being destined for No 1 Group reported to Lindholme Heavy Conversion Unit for our four-engine training. As the farm on which I was born, was at this time being made into a bomber airfield near the Wash, I naturally would have preferred being posted to No 5 Group which occupied South Lincs, but of course had no say in the matter and was thankful that 1 Group was not any further north. The Nav, who also preferred South Lincs, to be near to his new wife, was however able to play a useful card. Unbeknown to us sergeants, a bit of a furore had arisen in the Officers' Mess where an Australian squadron leader who had been promised a squadron at Binbrook (1 Group) (and not suffering from inhibited reserve) was raising Cain because bureaucracy had, in error, sent him to 5 Group. Resenting his forthright attitude, they insisted on keeping him in 5 Group unless he found a 1 Group crew willing to swap with him. Alerted by the Nav, I immediately volunteered, gained his undying gratitude and the promise of unlimited beer whenever we should meet, and Chatterton's crew were on their way to 1660 HCU Swinderby in 5 Group.

The delay had put us back a course so we did a fortnight's PT and cross country running before starting the ground school that would introduce us to the four-engined bomber and its operation. We started flying on 16th Sept over a month after leaving the Whitley.

Due to squadron losses and Harris' expansion plans, Lancasters were in short supply, Manchester fuselages were used for ground drills and the barrel was scraped in the Command to find four-engined trainers. By 1944 this was solved when the Stirling was taken off operations and crews were able to do 40 hours on Stirlings at HCU with a brief Lancaster conversion at a Lancaster Finishing School. In autumn 1943 Stirlings were not available and I found myself doing my first four hours dual on a few

ancient Halifaxes that had been acquired to help out. These were an early Mark and prone to problems. All three crashed during my first four days, and luckily my crew was not on one of them, though I did lose my instructor. With great relief I did 2½ hours dual on the Lancaster and went solo. She seemed big and heavy but with an innate eagerness, was a delight to fly and very forgiving to a pilot who wasn't sure to within a few feet where the ground was.

The two extra crew members were given to us (no choice this time) bringing the crew to its normal total of seven. The mid-upper gunner was an 18 year old Canadian, very keen, who appeared a bit brash at first but we soon got used to him and really appreciated his eagerness and keen eyesight. The flight engineer was a real bonus – he had done a flight mechanics course before his FE training, so was well versed in the ways of Merlins. I was not used to having help with throttles, pitch levers, flaps and undercarriage, but took it very well and found it very useful to have a second pair of eyes monitoring the instruments and keeping a look out. We developed into a very good team in the cockpit and honed and streamlined the drills and checks into such an efficient package, that when we finished our tour we were sent as a two-man team to No 5 LFS (Lanc Finishing School) to pass it on to new crews.

We did longer navigation exercises (Bullseyes) where we contested our own searchlights (but fortunately not our 'ack ack',) dropped more practice bombs, practised corkscrews and fighter affiliation. We flew on three and two engines and tried it on one, we practised overshoots and taking off with loads. Finally, after 39 hours flying and 6 on the link trainer, where I started the Flight Engineer off at the controls so that later on he would, after practice in the air be able to fly the Lancaster sufficiently well to get it over friendly territory for a bale out, we were posted to No 44 (Rhodesia) Squadron at Dunholme Lodge just north of Lincoln. I was going to be an operational pilot at last with a grand total of 400 flying hours – half of which had been on singles.

There was still some training to do on the squadron, practice bombing, and navigation exercises as new radar equipment became available, ground practice at abandoning aircraft and launching a dinghy from a Manchester carcass in a nearby gravel pit, but the early obligatory bit was for real – a second dickey trip with experienced crews for the pilot and navigator. These were a bit of a nuisance for the old hands, especially in the cockpit where a second pilot got in the way of the team. When, later in my tour, my turn came to pass on experience I always tried to wangle 2nd Navs instead

of 2nd pilots as the trainees; there-was much more room in the Nav's department.

I actually had to make two 2nd dickey trips, the first, the day after I arrived, with the Flight Commander was entirely enveloped in cloud and we saw nothing of the target marking at Leipzig; so he said 'You didn't learn much from that!' and sent me off a few days later to Dusseldorf on a clear night with a seasoned NZ flight sergeant. It was only a four hour trip but I had a vivid initiation into the lively *Flak*, searchlights and night fighters of the Rhur. Actually the Flight Commander was wrong – what I learnt from his cloud-ridden trip to Leipzig and the nonchalant way he coped with icing and loss of the airspeed indicator was to save our crews lives in the future.

After the 2nd dickey trips we went on our first trip as a crew to block a rail tunnel in the Alps where supplies were going through to Italy. It was a gentle initiation but the next three in a row were to the Big City – Berlin itself!

It was about at this time that I invested three weeks pay and bought my Austin Seven for £15 – and that's where I came in.

Closing Remarks

Air Marshal Sir Freddie Sowrey, Chairman RAF Historical Society

Thank you CFS for such a wonderful presentation

Can I give you a word or two about the Genesis of today. It was as a result of the exchange of letters between Group Captain Ian Madelin of the Air Historical Branch and the previous CinC, Sir John Thomson. We considered in the Society what we might do at Brampton and training seemed to be the subject that fitted into everybody's experience and one in which we are all instant experts. We are delighted, CinC, to have hit you with this on your first day in post and thank you and your Command, in particular Hugh Griffiths and Andrew Thompson, for all the hard work that has been put in; on the Society side, Henry Probert's Programme Committee and of course David Clark, the mastermind and architect of today. We owe him a tremendous debt. John Gingell has already been thanked and given a modest little document which may remind him what flying training was like many years ago.

Perhaps one of the historical lessons of today could be the keeping of flexibility, listening to the comments, views and experiences of others but then making your own judgement and making up your own mind. Secondly, when you have done an apprenticeship in a unit at whatever level and you have got some practical experience, be prepared to plough that back into the system by becoming an instructor and by being the squadron or unit trainer in whatever your particular field may be. The greatest mistake that the *Luftwaffe* made was to keep their best aircrew and administrators always at the sharp end in the front line; thus the experience that they had gained was never passed on to subsequent generations of pilots coming up. Lastly, it is well to remember that it is at the working level of flight lieutenants, squadron leaders and wing commanders where all decisions and successes are being made; the amount of effort and training that we put into that mid-rank, mid-career structure is one of the keys to the professionalism of the Royal Air Force today. Thank you all gentlemen very much.

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Membership Secretary: Since this issue of *Proceedings* went to press, regretfully Peter Montgomery resigned and Jack Dunham was elected at the 1993 Annual General Meeting to replace him. At the same meeting Joe Ainsworth was also confirmed and elected as General Secretary.

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