

RAF COLLEGE CRANWELL

College Journal Extracts



January and December 1970

January 1970 - Passing Out 96 Entry (1)



The Reviewing Officer inspecting the Graduation Parade of No 96 Entry

THE GRADUATION OF No 96 ENTRY

The Graduation Parade of No 96 Entry took place on the morning of 1st August, 1969. The Reviewing Officer was Generale Duilio S. Fanali, Chief of the Air Staff, Italian Air Force. The parade was commanded by Senior Under Officer A. P. Matthews and the Parade Adjutant was Under Officer C. J. Morris. The Sovereign's Squadron was commanded by Senior Under Officer E. J. Waterfall and 'A', 'B' and 'C' Squadrons were commanded respectively by Under Officer P. N. Derbyshire and Senior Under Officers S. G. Appleton and S. W. Hunt.

After the Advance in Review Order, the Reviewing Officer presented the Sword of Honour to Senior Under Officer A. P. Matthews, the Queen's Medal to Under Officer C. J. Morris and the Groves Memorial Prize and Kinhead Trophy to Senior Flight Cadet C. C. Baldwin. He then gave the following address :

Cadets of the 96th Senior Entry, Ladies and Gentlemen : The Italian Air Force and I, personally, are deeply honoured to have received this invitation to officiate this important ceremony, so much more considering the long list of illustrious figures that have preceded me, above all your gracious Sovereign, Her Majesty Queen Elizabeth.

However, I like to feel that I am not a complete stranger amongst you. As a young officer in the early thirties, while I was training for the Schneider Trophy, I first experienced a competitive and friendly feeling towards the Royal Air Force pilots whom I was going to race against.

World events unhappily put a stop to all this and during World War Two, I had first-hand proof of the gallantry and skill of the Royal Air Force in the skies of Malta, of North Africa, of the Mediterranean and, later, almost at the conclusion of the war in Europe, with the Italian Fighter Units, as part of the Balkan Air Force.

I served as Air Attache to the Italian Embassy in London immediately after the war. I have now the great privilege of counting in the Royal Air Force many friends, most of whom graduated from this famous College.

The links between this College, so full of tradition, and the Italian Air Academy are, today, very close ; they reflect, as well as a similarity of institutions and customs the bonds which have existed for many years between the Royal Air Force, the first in the world to be born as an independent Service, and the Italian Air Force, who very closely followed.

Bonds of friendship and reciprocal esteem started years ago during peaceful competitions and developed in wartime with episodes of great chivalry, generosity and respect on both sides.

The Atlantic Alliance has decisively sealed an old and historic bond.

Aviators are bound by firm links and perhaps more especially the military ; this gathers them into a unique family whose ties are sometimes even stronger than brotherhood.

I am sincerely happy to be among you today and to be present at this ceremony. That it holds a deep meaning for you and most certainly for me is confirmed by the solemnity of the occasion and the roll of important figures who presided over it in the past.

It would seem a superfluous platitude to say that the parade was carried out to perfection, given the tradition for perfection which your College has.

Perfection is not just a habit, however. The shining glory of the past creates and demands a greater zeal for the future and increases the burden of responsibility which has to be shouldered.

Being convinced of this, I wish to offer my most sincere congratulations first to the prize winners ; for the ceremony and the parade, to all those who were concerned in it — the Commandant, the Officers and you all, the Cadets, who are the real hope of the future.

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I would like to address you (guardandoli a ventaglio) in particular and from my previous statements it will no longer seem strange that an officer who is a foreigner, and fervid friend, belonging to an Allied Country, should speak to the Cadets of this College as though they were his own.

We, Airmen, recognize each other and understand each other, beyond all language barriers. In fact some amongst you may even understand what I am saying. You all have anyhow already experienced this feeling as some of you come from different countries.

This kinship is the natural outcome of three fundamental causes :

- The aim of our profession ;
- The sphere in which we work ;
- And the training which we have received.

The aim of our profession undoubtedly demonstrates a noble and courageous reason for its existence.

The Armed Forces throughout the ages have always been inspired by a noble ideal.

They have always been the most genuine expression of a people, leading them through

the most significant and important moments through better and worse, ready to bring glory and success to the entire nation and withstand hardship and sacrifice in times of distress.

The position of the Armed Forces today is even nobler than in the past, since in the civilised and peaceloving nations of the world their role is solely defensive.

Defence is a sacred right of all the peoples in the world. It is born from the right to survive within the bounds of liberty, from tradition and from the outlook on life.

The Armed Forces are an assurance to civilisation and are only called upon when a threat darkens the skies ; whilst they are a means of training, of friendship and of education when peace and security reign.

The cells of these vital organisations can be compared to white corpuscles in the blood ; ready to fight against illness and to sacrifice themselves in order to restrain, destroy and ward off evil.

Here lies the true merit of the man who dedicates himself to military life, who is still



The Reviewing Officer with Under Officer C. J. Morris, Senior Under Officer A. P. Matthews and Senior Flight Cadet C. C. Baldwin



The Reviewing Officer presenting the Sword of Honour to Senior Under Officer A. P. Matthews

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more worthy because of his unselfishness and spirit of abnegation, when one takes into consideration the large scale competition at all levels of civilian life, especially regarding personal gain.

The sphere in which we work : if we ponder on the Airman's environment we have to admit that it places him in a position not fully natural to man. He finds that he is in continual conflict with himself.

By dominating an ever more powerful and complex machine, breaking the natural barrier and living the loneliness found in continually comparing himself with the universe, the Aviator modifies and exalts his state of mind. He creates a certain psychological wall, and thus Airmen are a race apart, ready to consider themselves as the sole citizens of a world real but fantastic, unusual and expensive and above all materially and spiritually distant from the many sorrows of life.

And finally there is the training.

Youth is moulded both physically and spiritually and welded into an exact model of perfection by the moral preparation given in Military Colleges. This is due to the conscientious education, the exaltation of spiritual and inner values, such as loyalty, generosity, spirit of sacrifice and submissiveness of the individual to Society.

What I have already said should be sufficient to explain fully the spiritual affinity, the unity of purpose and dedication in work among the Airmen of many different countries.

However, I would like to refer to another question which, I think, is very pertinent and to the point ; I am referring to the sentiment and realisation which drives all Europeans, whether they are continentals or islanders, and more especially the younger generation, to feel themselves citizens of a greater, nobler Motherland, without loss of love or loyalty to their individual Countries. This nation that provided our origins and traditions ; this Motherland in whose bosom every patriotic ambition and dissention will be understood and quelled, linked by a common brotherhood and unity : this Europe !

You who are listening to me today, the young Cadets of this College, may perhaps be bored and impatient with this long speech given by an old Aviator, but listen to me just another moment and think upon the message that I want to bring to you.

One of man's greatest conquests is Aviation ; it has laid open the way to the exploration of the Cosmos.

You, the youth, are fortunate in the life that awaits you. I do not imply that it will be paved with flowers and roses, but I think that you are fortunate because what counts now and will count in the future will be overall the inspiration of your choice.

A whole universe of discoveries, sensations and success lies before you : so wonderful that it is able to feed the spirit of man with a perpetual flame of enthusiasm, and compels an old man, as represented by the person who is addressing you today to say : " I wish I could start all over again."

Besides, being made officers today, a degree of Authority will be conferred upon you. You are destined to lead other men and not just means of war that are developed by the high technical ability, ingenuity and diligence, to be found in the British people.

Added to this Authority imparted to you there will always be a corresponding responsibility, for even if man is an integrating part of this huge mechanism called progress, he is also the only true protagonist in the grandiose happenings of this century, particularly in these days when we have been spectators of the realization of a world-old dream : man's conquest of the moon, due above all to his intelligence, to his will, to his perseverance and to his courage.

I am sure that you fully understand the real meaning of the life that awaits you and that you will always be worthy of the glorious tradition of your College, your Air Force and your Country.

Speaking to you with the heart of an old and knowing Airman, I extend to you my warmest wishes for your future career and life. Very good luck. Buona fortuna.

THE WINGS AND PRIZES CEREMONY

Presentation of Wings and Prizes to No 96 Entry were made by the Commandant, Air Vice-Marshal T. N. Stack, CB, CVO, CBE, AFC, in the Whittle Hall on 31st July, 1969.

After making the presentations Air Vice-Marshal Stack addressed his audience :

Ladies and Gentlemen : It is always a great pleasure to welcome so many parents, relations and friends of the Senior Entry to this ceremony which precedes the parade tomorrow.

I realise that some of you have come long distances and are put to considerable inconvenience to be here for these two days of celebrations but your presence adds considerably to the occasion and I am sure anyway that you wouldn't wish to miss it, for it marks the end of all the basic training which we can give here to the members of 96 Entry. Tomorrow we see them march off the parade ground as commissioned officers in the Royal Air Force.

Having just given out the bulk of the prizes I remind you that the three major ones have yet to be presented : and they will be given tomorrow during the parade by our visiting Reviewing Officer, Generale Fanali, the Chief of the Italian Air Staff.

The General is an extremely experienced pilot - with 8,000 hours - and is a graduate of the Italian Air Force Academy - our opposite number in Italy. Among his many appointments he has served as air attaché in London and has been Commandant of the NATO Defence College in Rome. He visited Cranwell last year and we're delighted that he has been able to come back.

And now I am sure you would like to join with me in congratulating the winners of the three main awards :

Senior Under Officer A. P. Matthews, who has won The Sword of Honour ;

Under Officer C. J. Morris who has won The Queen's Medal ; and

Senior Flight Cadet C. C. Baldwin who has won the R. M. Groves Memorial Prize and Kinkead Trophy for Flying.

Well done you three - and indeed well done all the winners - but don't forget that there is often only a very fine dividing line between the first who gets the prizes and the others who don't. So there's no need to be despondent just because you haven't won anything. There will be other opportunities in life and your turn will come.

While on the subject of prizewinners I must make mention of 'A' Squadron's achievements - they have (as you will have noted), pretty well have swept the board of cups and trophies and I commend them on becoming Sovereign's Squadron as a result of their efforts. However, I don't doubt that the other Squadrons will make up their minds to do something about this next term !

Now before I regale you with the success (or otherwise) of No 96 Entry I would like to comment on one or two matters of concern to us here.

We have seen at the College, particularly during the period that the Entry has been under training, a number of plans for changes in the College training pattern. And as the outcome, which we all know of, we are now working towards the Graduate Entry Scheme : and this means that very shortly the only entrance qualification acceptable for coming to Cranwell will be a degree. This is perhaps the most important change in recruitment policy in the 49 years history of the College and while I have heard much discussion on the rights and wrongs of this step, I firmly believe it to be right.

The Royal Air Force must continue to demand the highest qualities of leadership and ability from its young men but — as the world advances so quickly in the sociological as well as in the technological field, we must ensure that our officers have the trained minds to cope with the complexities which have yet to come.

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This doesn't mean that those of you on 96 who won't get diplomas or degrees are therefore "thickheads" - as was suggested in your Review ! (although I'm willing to bow to your well-informed opinion on the matter!) - but it does mean that we've got to look ahead to the next decade and beyond and plan our training accordingly, and not just assume that what has suited the last fifty years will do for the next fifty.

To take an example, a week ago we all watched enthralled while the most adventurous event ever known to man unfolded. The three astronauts, Armstrong, Aldrin and Collins embarked on a mission to the moon of immense complexity and they, the top of the pyramid of 400,000 people of all disciplines engaged on the project, brought it to a successful conclusion.

Some say it was the biggest event in human history since the Wright Brothers; others say since Columbus. Yet others liken it to that moment in our human evolution when the first fish moved on to dry land. That last is perhaps too fanciful; but it is certainly true that the moon landing is the first time we humans have moved into a completely alien environment by setting foot as we did on another celestial body.

By any standard it was a stupendous step forward and one for which we in the Air Force naturally feel a greater affinity and a greater understanding than do the other two Services. As "Flight" commented the other day: "We mustn't forget that this greatest achievement of the human species is an aviation achievement. And when we talk about Man's awesome technological progress, we are nearly always talking about aviation progress."

I'm not saying that any of you here are necessarily destined for the moon just yet, but I'm sure that we in the Air Force must in due course be concerned in space, either in a European space venture or more probably in a joint US - Europe programme. And when the time comes our young men must have had the necessary mind training to cope; and here we see one of the reasons for moving to the graduate scheme.

For the moment of course lack of money

keeps us out of space, but the time will come. Until it does, however, you must keep aware of the military implications of events such as this and not feel that space is something for others but never for us.

But as well as keeping an eye on space matters you must keep abreast of successful advances in techniques for current operations and you should be ever seeking better and more efficient methods of doing your job - which is - I must remind you - to wage war, so that you are at the peak of your efficiency should this country ever again need defending.

Of course the problem in all the studies which lie ahead of you is that events and achievements never stand still. One so often wishes that they did for a few years at least! But the rate of scientific discoveries and their exploitation will continue to increase ever faster. An example will show you what I mean.

After many thousands of years of the world's history, the first humans ever to experience powered flight, the Wright Brothers, left the ground for 150 yards in the early 1900s, flying at about 30 to 40 mph. Some 40 years later 400 mph was reached and for some time after, this was considered near the upper limit because of the sound barrier. Today jets fly at 1,500 mph and we have spacecraft doing no less than 25,000 mph.

Admittedly to get comfortably about our solar system and certainly to leave it and to reach the nearest star we have to think in terms of speeds approaching a respectable fraction of the speed of light, which is of the order of 200,000 miles per second. This appears to be quite unattainable now - after all a round trip from here to the moon and back in 2½ seconds is moving some - but I suggest to you that just as we went through the sound barrier so we will eventually deal with what we might call the light barrier.

Similar examples of the fantastic rate of advance in science and of the forecasts that follow from them could be drawn from the fields of weapons, communications, methods of computation and indeed from a host of areas vital both to the civilian and the military man.

The biggest loss rate of the Entry (50%) has been sustained by the Navigators, and only four remain. They have put up an above average performance however, and indeed one of this small band has won the second highest prize here.

The pilot contingent is 27 strong - much smaller than normal. They have kept their failure rate down to a commendable 12% and pass out at a good average standard. They have also bettered the Command Ground School exam. average.

And how has the Entry performed academically? Overall they are assessed as average. In common with previous entries the written work has not matched oral ability but the Director of Studies Essay Prize competition entries were of a high standard and Senior Under Officer Appleton is to be congratulated on his submission.

Senior Flight Cadet Page did very well to gain his Civil Service Linguist examination in French and Senior Under Officer Waterfall and Senior Flight Cadet Deacon-Elliott are also to be congratulated on qualifying for the award of £100 apiece for their proficiency in that language.

Finally, mention must be made of the Entry's sporting activities. They have gained no less than 39 sports colours, with 11 flight cadets winning double colours. This is a splendid record.

They have played for and represented the College in practically every sport we have to offer and have also represented in various sports the Command, the Royal Air Force and the local County. One flight cadet managed to be in the pair that won the Royal Air Force Inter-Station tennis doubles.

You have all set extremely high standards in your support of College and Service activities and I suspect it could be many years before we see such an excellent performance again. Well done! I would also like to say that by and large yours has been a happy course and a pleasure to have at the establishment.

Now before I finish I want to impress one point upon you all this afternoon concerning your results and your general standards - and this is that during your stay at Cranwell you have had the benefit of first class and dedicated instruction.

From what I know of the staff here and staffs elsewhere I consider that you have been privileged to have some of the best that the Royal Air Force can produce. This covers your officer training, your specialist training, and your academic training.

For example, you may not be aware but the ground training staff includes 114 graduates, of whom 38% hold post-graduate qualifications.

On the flying staff, of 64 pilot instructors, we boast three A1's and eighteen A2 category instructors. These are high standards indeed. Among our navigation instructors we have the only A1 navigation instructor in the whole of the Command.

And to add point to our quality, for the second year running a Cranwell flying instructor has won the coveted Training Command Wright Jubilee Trophy for aerobatics.

I sing the praises of the instructional staff to remind you and your parents that you have started your careers with the best possible grounding that the Royal Air Force can offer. I would like to record my thanks and appreciation to all the staffs - and in many cases, to their wives - for the devoted and loyal manner in which they go about their most demanding duties.

Don't forget the standards that you have seen during your stay at the College. If you profit from this start I am sure every one of you should have a full and worthwhile career ahead of you.

Well, there you are - I've given you a little advice and I've done a little crystal-gazing. I've run through your achievements and given you a pat on the back; and I've given the establishment a pat on the back! And I'll finish by wishing you all good luck in your very exciting future.

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COMMISSIONING LIST No 96 ENTRY

- S. G. APPLETON, Senior Under Officer (Secretarial): Director of Studies Essay Prize 1968; Cross-country (Vice-Captain, Colours), Royal Air Force Athletics (Vice-Captain, Colours).
- S. W. HUNT, Senior Under Officer (Pilot): The Philip Sassoon Memorial Prize; Squash (Colours, Captain); Golf (Colours); Rugby; Cricket.
- A. P. MATTHEWS, Senior Under Officer (Equipment): The Sword of Honour and the R. S. May Memorial Prize; The Ministry of Defence Prize for Equipment Flight Cadets; The Alastair Black Memorial Trophy for General Service Training; Football; Cricket; Debating; Cadet Editor of College Journal, 1968.
- E. J. WATERFALL, Senior Under Officer (Pilot): Cricket (Colours); Rugby; Hockey; Athletics; Paragliding; Aeronautical Society.
- D. T. BILLS, Under Officer (Regiment): Judo; Rugby; Go-Karting.
- P. A. BOTTERY, Under Officer (Engineering): Judo (Royal Air Force); Soccer; Walking; Radio Society.
- R. J. G. CALDER, Under Officer (Pilot): Rugby; Judo; Squash; Parasailing; Skiing.
- R. M. COLLIER, Under Officer (Secretarial): Basketball; Cricket; Music Society.
- M. DAVIES, Under Officer (Engineering): Canoeing (Command Colours); Sailing.
- P. N. DERBYSHIRE, Under Officer (Pilot): Football; Cricket.
- C. D. EVANS, Under Officer (Secretarial): Rugby (Colours); Athletics (Colours); Mountaineering; Dramatic Society; Walking.
- C. J. EVERITT, Under Officer (Pilot): Hockey (Colours); Golf (Colours); Sailing; Motoring Society.
- G. F. HODGSON, Under Officer (Navigator).
- B. N. B. LEIGH, Under Officer (Secretarial): Athletics (Colours); Cross-country (Colours).
- W. METCALF, Under Officer (Pilot): Rugby; Sailing; Gliding; Aeronautical Society.
- C. J. MORRIS, Under Officer (Navigator): The Queen's Medal; The Ministry of Defence (Royal Air Force) Prize for War Studies and Humanities and the Royal New Zealand Air Force Trophy; Basketball.
- C. K. NEO, Under Officer (Engineering): Badminton (Colours); Tennis (Colours).
- A. J. PARK, Under Officer (Pilot): Rugby (Colours); Athletics; Badminton; Tennis; Hillwalking.
- W. G. SIMPSON, Under Officer (Equipment): Fencing (Colours); Motoring; Walking; Aeronautical Society.
- P. M. AKEHURST, Senior Flight Cadet (Pilot): Basketball (Colours).
- K. L. ANDERSON, Senior Flight Cadet (Secretarial): Football; Athletics.
- G. BAIRSTOW, Senior Flight Cadet (Pilot): Football.
- C. C. BALDWIN, Senior Flight Cadet (Pilot): The R. M. Groves Memorial Prize and Kinkhead Trophy for Flying; The Dickson Trophy and Michael Hill Memorial Prize for Applied Flying; Badminton; Flying Club.
- BANDAR SULTAN, Senior Flight Cadet (Pilot): Fencing; Squash; Soccer; Flying Club.
- H. M. C. BATES, Senior Flight Cadet (Pilot): Cricket (Colours); Soccer (Colours).
- C. BRADSHAW, Senior Flight Cadet (Engineering): Aircraft.
- A. F. CANT, Senior Flight Cadet (Equipment): Walking.
- J. K. CARTLIDGE, Senior Flight Cadet (Engineering): Skiing (Colours).
- A. W. CHACKSFIELD, Senior Flight Cadet (Regiment): Sailing; Rugby.
- J. B. CLARK, Senior Flight Cadet (Pilot): Athletics (Colours); Cross-country (Colours); Walking.
- R. A. COLE, Senior Flight Cadet (Pilot): Gliding; Shooting; Rowing; Canoeing.
- R. C. DEACON-ELLIOT, Senior Flight Cadet (Pilot): Squash (Colours); Cricket; Hockey; Rowing; Paragliding; Gliding; Dramatical Society Aeronautical Society.
- A. DUNMORE, Senior Flight Cadet (Engineering): The Chicksands Cup for B.Sc. (Hons) Sandwich Course in Electrical/Mechanical Engineering; Riding; Radio Society.
- F. W. FOSTER, Senior Flight Cadet (Pilot): Sailing (Colours); Ocean Sailing; Motoring; Gliding Instructor.
- J. L. HAMER, Senior Flight Cadet (Engineering): Riding (Colours).
- B. G. HANDYSIDE, Senior Flight Cadet (Pilot): Skiing; Cricket; Rugby; Editor of College Journal.
- D. J. V. HARDIE, Senior Flight Cadet (Pilot): Shooting (Colours).
- P. J. HARDING, Senior Flight Cadet (Engineering): Hockey (Colours); Tennis (Colours); Skiing.
- W. A. HOUSEMAN, Senior Flight Cadet (Engineering).
- N. B. HUNTER, Senior Flight Cadet (Pilot): Swimming (Colours); Water Polo; Parasailing; Debating.
- R. H. HUNTER, Senior Flight Cadet (Pilot): Skiing (Colours); Sailing; Shooting; Parasailing; Ocean Sailing; Gliding; Photography.
- C. D. JOYNER, Senior Flight Cadet (Pilot): Basketball (Colours); Tennis (Colours); Athletics.
- R. N. LAWRENCE, Senior Flight Cadet (Regiment): Motor-Cycling; Parashuting; Angling; Pop Group.
- A. H. MANN, Senior Flight Cadet (Regiment): Badminton (Colours); Modern Pentathlon (Colours); Fencing.
- J. McCARTNEY, Senior Flight Cadet (Engineer): The Ministry of Defence (Royal Air Force) Prize for the Higher National Diploma Course; Badminton; Radio Society; Record Society.
- P. C. MINTER, Senior Flight Cadet (Engineering): Photography; Radio Club; Climbing; Walking.
- B. S. PAGE, Senior Flight Cadet (Equipment): The Ecole de l'Air Trophy for French Studies; Cricket; Rugby; Skiing; Mountaineering.
- J. W. PEARSON, Senior Flight Cadet (Pilot): Hockey; Motoring Society.
- A. G. PROCTER, Senior Flight Cadet (Pilot): The Hicks Memorial Trophy for Ground School Subjects; The Abdy Gerrard Fellowes Memorial Prize for Maths and Science; Hockey; Canoeing; Badminton Swimming; Sub-Aqua; Choir.
- R. P. RADLEY, Senior Flight Cadet (Pilot): Water-Skiing; Music Society.
- J. V. RAIMONDO, Senior Flight Cadet (Engineering): Sailing; Canoeing; Photography; Skiing.
- Z. A. SAIFURRAHAM, Senior Flight Cadet (Engineering): Hockey (Colours); Radio Club.
- J. SARGENT, Senior Flight Cadet (Pilot): Badminton; Motoring Society; Photography.
- P. J. SCOTT, Senior Flight Cadet (Engineering): Golf (Colours); Cricket.
- D. G. SEFTON, Senior Flight Cadet (Equipment): Sailing (Colours); Ocean Sailing.
- M. SHREWRY, Senior Flight Cadet (Regiment): Swimming (Colours); Water-polo; Judo; Skiing.
- I. R. McN. SPALDING, Senior Flight Cadet (Secretarial): The Ministry of Defence (Royal Air Force) Prize for Secretarial Flight Cadets; Cricket; Soccer; Skiing; Canoeing.
- T. J. SUMMERS, Senior Flight Cadet (Pilot): The Battle of Britain Trophy for Aerobatics; Photography; Gliding.
- G. D. P. THORPE, Senior Flight Cadet (Secretarial): Sailing (Colours); Go-Karting; Skiing; Ocean Sailing.
- C. E. WADE, Senior Flight Cadet (Navigator): The Institute of Navigation Trophy and the Ministry of Defence (Royal Air Force) Prize for Navigators; Go-karting.
- R. J. N. WARREN, Senior Flight Cadet (Engineering): Squash; Cricket.
- J. H. WOMPHELY, Senior Flight Cadet (Pilot): Basketball (Colours); Paragliding; Water-skiing; Fine Arts.

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No 96 ENTRY

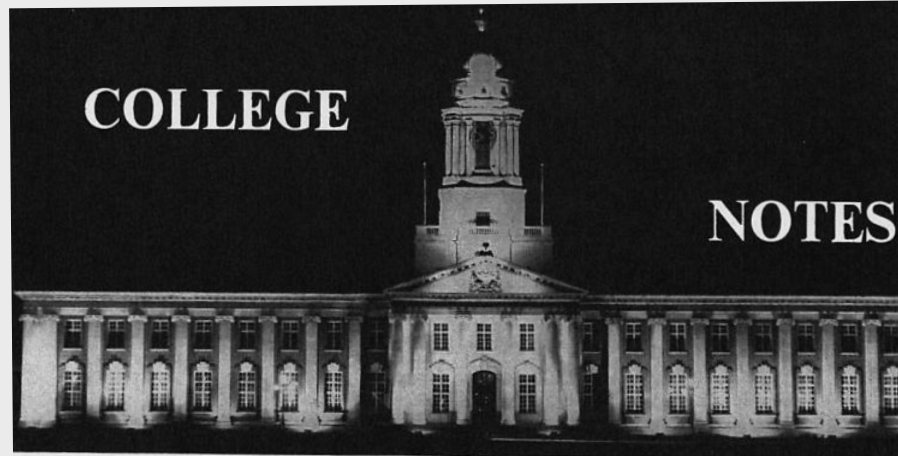
Back Row : Senior Flight Cadets R. N. Lawrence, R. J. N. Warren, J. K. Cartlidge, Z. A. Saifurrahman, N. B. Hunter, A. F. Cant, J. M. Womphrey, A. W. Chacksfield, P. J. Harding, A. G. Proctor, D. G. Sefton, J. C. Bradshaw, J. B. Clark, R. C. Deacon-Elliott, R. A. Cole, K. L. Anderson.

Third Row : Senior Flight Cadets R. H. Hunter, J. V. Raimondo, J. Sargent, J. D. V. Hardie, C. C. Baldwin, C. E. Wade, B. S. Page, C. D. P. Thorpe, R. P. Radley, T. J. Summers, G. Bairstow, P. C. Minter, P. J. Scott, F. W. Foster.

Second Row : Under Officers W. Metcalfe, R. M. Collier, Senior Flight Cadets W. A. Houseman, B. G. Handyside, Bandar bin Sultan bin Abdul Aziz, I. R. McN. Spalding, J. McCartney, J. W. Pearson, H. M. C. Bates, P. M. Akehurst, C. D. Joyner, A. Dunmore, J. L. Hamer, M. Shewry, Under Officer D. T. Bills.

Front Row : Under Officers W. G. Simpson, P. A. Bottery, A. J. Park, B. N. B. Leigh, C. J. Morris, C. J. Everitt, Senior Under Officers E. J. Waterfall, S. G. Appleton, A. P. Matthews, S. W. Hunt, Under Officers C. K. Neo, P. N. Derbyshire, R. J. G. Calder, G. F. Hodgson, M. Davies, C. D. Evans.

January 1970 - College Notes (1)



GROUP CAPTAIN G. R. D. CALDER, DCAe, C Eng, AMI Mech E, AFRAeS

After three years in the post of Chief Instructor Mechanical Engineering Wing, Group Captain Calder, who was promoted to his present rank in January 1969, left the Royal Air Force College in July 1969 to take up an appointment at the Ministry of Defence.

During his tour at the College he has done much to develop and improve engineering training and the Department of Engineering owes much to his energy, drive and ability. He made a significant contribution to the development of the new CNAA Degree Course and by his untiring efforts has done a great deal to improve the professional recognition of Royal Air Force Officers by the Institute of Mechanical Engineers.

He has always shown a great interest in the welfare and progress of the students under his control and was highly admired and respected by all ranks.

We extend our very best wishes to Group Captain and Mrs. Calder for their continuing happiness and success in the future.

GROUP CAPTAIN G. E. THIRLWALL, B Eng, DCAe, C Eng, AFRAeS, MBIM

Group Captain Thirlwall came to the College from CFS in April 1967 to fill the newly established post of Group Captain Training in the Department of Engineering. It was his second training appointment, having been a member of the staff of Systems Engineering Wing at the Royal Air Force Technical College from 1958-1960.

At the time of his arrival, the Department was still in the process of settling down after the merger with the Technical College Henlow and with his customary energy he was soon deeply involved in the many problems facing the Department. He played a major part in the restructuring of the new CNAA Degree Course and throughout his tour his logical approach and tremendous drive has been an inspiration to all those who have worked with him.

He left the College in April 1969 to become the Officer Commanding No 30 MU Royal Air Force Sealand. We extend our very best wishes to Group Captain Thirlwall and Mrs Thirlwall and wish them every happiness and success in the future.

GROUP CAPTAIN A. W. CULMER, MBE, BSc (Eng), DCAe, C Eng, MI Mech E, AFRAeS, ACGI

Group Captain A. W. Culmer was appointed Group Captain Training in the Department of Engineering at the Royal Air Force College on 14th April 1969.

He first served in the Royal Air Force from 1942-1945 and during this period gained his pilot's wings. He left the Service in 1945, but re-joined in 1949 as an Education Officer. Shortly after, he completed a two year course at Cranfield, being awarded a Diploma with Distinction and the Governor's Prize. He subsequently served as an instructor at Henlow before transferring to the Engineer Branch in 1956. As an engineer officer he has served in a wide range of appointments at home and in the Middle East. More recently he has been with the Ministry of Defence in the Directorate of Mechanical Engineering, with special responsibility for the engineering aspects of the introduction into service of the Phantom.

We extend a very warm welcome to Group Captain Culmer, Mrs Culmer and their family.

HONOURS AND COMMENDATIONS

The *Journal* offers its congratulations to the following College personnel, who have received honours, awards and commendations:

Group Captain D. B. Craig, OBE, MA, Officer Commanding College Unit, was appointed Aide-de-Camp to Her Majesty the Queen.

Flight Lieutenant D. G. Robinson, LRAM, ARCO(CHM), ARCM, was made a Member of the Order of the British Empire.

Flight Sergeant T. J. Palmer, Chief Technician J. E. G. Fallen and Sergeant M. Bethune were awarded the British Empire Medal.

Flight Lieutenant R. L. B. Bell was awarded the Queen's Commendation for Valuable Service in the Air.

The Air Officer Commanding-in-Chief has commended Flight Lieutenant K. Broughton, Warrant Officer J. S. Foot and Mrs I. E. Burrows for meritorious service.

The Air Officer Commanding has commended the following for meritorious service: Mr. R. C. Dickinson, Mr. J. Louth, Mr. T. B. Wheeler and Mr. G. M. Williams.

Mr. P. A. Pulford, who has completed 31 years' service with the Air Ministry Works Department and the Ministry of Public Buildings and Works was awarded the Imperial Service Medal.

PROMOTIONS - No 97 ENTRY

The following promotions were made in No 97 Entry in August 1969:

'A' Squadron: Flight Cadet Senior Under Officer T. C. Hewlett; Flight Cadet Under Officers A. R. Taylor, M. S. Rees, W. L. J. Coyle, A. J. W. Boyd.

'B' Squadron: Flight Cadet Senior Under Officer R. M. Thomas; Flight Cadet Under Officers R. A. Forsythe, M. A. Micallef-Eynaud, J. J. E. Parr, K. J. Burgess.

'C' Squadron: Flight Cadet Senior Under Officer D. S. Pollard; Flight Cadet Under Officers D. B. Bowden, G. Timms, P. D. Scoffham, R. C. Wardhaugh.

'D' Squadron: Flight Cadet Senior Under Officer R. J. North; Flight Cadet Under Officers G. A. Paterson, C. Fitzpatrick K. A. Hartley.

INTER-SQUADRON COMPETITIONS

The competition for the Prince of Wales Trophy and the title of Sovereign's Squadron was won in the Summer Term by 'A' Squadron who won the Knocker Cup, the Ferris Cup and the Chimay Trophy.

January 1970 - College Notes (2)

THE GRADUATE ENTRY SCHEME

THE INTER-WAR YEARS

Following the publication of the article 'Thirty Years On' in the July 1969 *Journal* we are very grateful for the following retrospective view of the life of a Graduate Entrant of the 'thirties' from Wing Commander E. A. Howell, OBE, DFC, RAF (Retd.):

Dear Sir,

As a University Entrant (BSc Hons) at Cranwell in the second of three courses held from 1934 to 1936, I read with interest Flight Cadet Hilton's article "Thirty Years On" in the July 1969 *Journal*.

Our Course (1935) was a very happy one and our experience at Cranwell was entirely rewarding. Friendships with the main group of cadets and with some of our instructors proved permanent, though many individuals did not survive the war. Of my course, the only other one alive today, is W. F. Beckwith.

We were all sorry that these courses were discontinued in 1936. My impression was that the mixture of University with other cadets was more an administrative headache than one of incompatibility as the article suggests.

For instance, I had already completed 400 hours as a Flying Officer in the Auxiliary Air Force (602 Squadron) before coming to Cranwell. Others had flown with the University Air Squadrons. So our instruction had to be tailored to suit and we could not be fitted into the general cadet courses.

Whatever the reasons, it was a pity that all regular officers could not enter the Service through Cranwell as we were fortunate enough to do. The new scheme now provides for this.

As a postscript may I add that I enjoyed my 14 years of Royal Air Force service more than somewhat! I was a Flight Commander (16 Squadron) by 1936 and a Squadron Leader by 1939. I commanded 33 Squadron (Hurricanes) in the Battle of Crete

in 1941, was wounded there and taken prisoner. After escaping in 1942 I served on the Air Staff as a Wing Commander at the Air Ministry and in the Pentagon. After Staff College in 1946, war wounds necessitated my retirement. Men like Brian Burnett, Bill Beckwith, Brian Roberts and others enjoyed long and distinguished careers in the Service and amply justified the *raison d'être* of the University Entrants at Cranwell of the Thirties.

Yours sincerely,
E. A. Howell.

No 99 ENTRY PRE-UNIVERSITY STREAM UNIVERSITY AND COLLEGE PLACING

Archer J., GD/P, Hull, BA Geography; Attwood D. J., GD/P, Southampton, BSc Aeronautical Eng; Bannister A. J., Equip, Cranwell, BSc, Engineering; Chamberlain D. B., GD/P, Edinburgh, BSc (Ord) Geography; Cheeseman S. B., GD/P, Manchester, BSc Aeronautical Eng; Clifford G. F., GD/P, Southampton, BSc Eng Science; Daffarn G. C., GD/N, City BSc Civil Eng; Edenbrow R. A. O., GD/P, L Chelsea, BSc Geology & Biology; Fry B. G. P., Sec, Portsmouth, BA English & History; Garstin J. C., GD/P, Portsmouth, BSc Economics; Gash C. A., Equip, Portsmouth, BSc (Ord) Elect Eng; Graves D. G., GD/P, Manchester, BSc Aeronautical Eng (4-year); Greeves B. J., GD/P, Exeter, BSc Eng Science; Griffiths R. O., GD/P, Belfast, BSc Aeronautical Eng (4-year); Grigor H. S., GD/N, Edinburgh, BSc (Ord) Civil Eng; Hurrell A. J., GD/P, Strathclyde, BA Hotel & Catering Management; Hutchinson R. D., GD/P, Portsmouth, BA Geography; Jasinski N. Z. R., GD/P, Loughborough, BSc Modern Europe; Johnston M. A. I. GD/P, Sheffield, BSc Electronic Eng; Kenvyn I. P., GD/P, Manchester Inst of Sci/T, BSc Civil Eng; Lannen C. A., Sec, Heriot-Watt, BSc Civil Eng (4-year); Mallaband P. D., GD/P, Manchester, BSc Metallurgy; McCarthy K. R., GD/P, Leicester, BSc Eng; McLean A. H., GD/P, City, BSc Chemistry; Moules P. L., GD/P, Kent, BA Law; Oakley D., GD/P, Bristol, BSc Geography; Oliver J., GD/P, Manchester, BSc Mechanical Eng;

Pedley J. F., GD/P, Reg St Poly, BSc Sociology; Pritchard K. H., GD/P, Southampton, B.Soc. Sci. Economics and Politics; Quick G. J., GD/P, L Chelsea, BSc Human Biology; Rank M., GD/P, City, BSc Aeronautical Eng; Rees G. D., GD/P, Manchester, BSc Aeronautical Eng; Richey F. A., GD/N, Manchester, BSc Electrical Eng; Robinson J. E., GD/P, Durham, BA General; Slater, N. J., GD/P, Southampton, BSc Aeronautical Eng.; Smith A. J., GD/P, NW Poly, BA General; Sproates G. N., GD/P, NW Poly, BA English; Stacey P. W., GD/P, Birmingham, BSc Physics; Swann A. H., GD/P, Reading, BA Modern History and Politics; Symes G. D., Sec, Birmingham, BA History; Todd F. W., GD/P, Glasgow, BSc (Ord) Appl Science; Togneri, R., GD/P, Edinburgh, BSc (Ord) Elect Eng;

Walker P. B., GD/P, Durham, BA General; Wells T. J. G., GD/P, East Anglia, BSc Maths & Physics; West A. M., Equip, Leeds, BSc (Ord) Fuel Science; Weston D. J., GD/P, Southampton, B.Soc. Sci. Economics; Wilcock, N. J., GD/P, L QMC, BSc Aeronautical Eng; Witts J. J., GD/P, Portsmouth, BA Geography; Yarrow T. B., GD/P, Portsmouth, BSc General.

Mr FREDERICK BROWN

We have just learned, with deep regret of the death of Mr Frederick Brown, Head Steward in College Hall. Mr Brown served at Cranwell for over thirty years and we express our sincere condolences to his widow.

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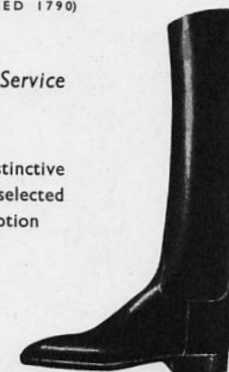
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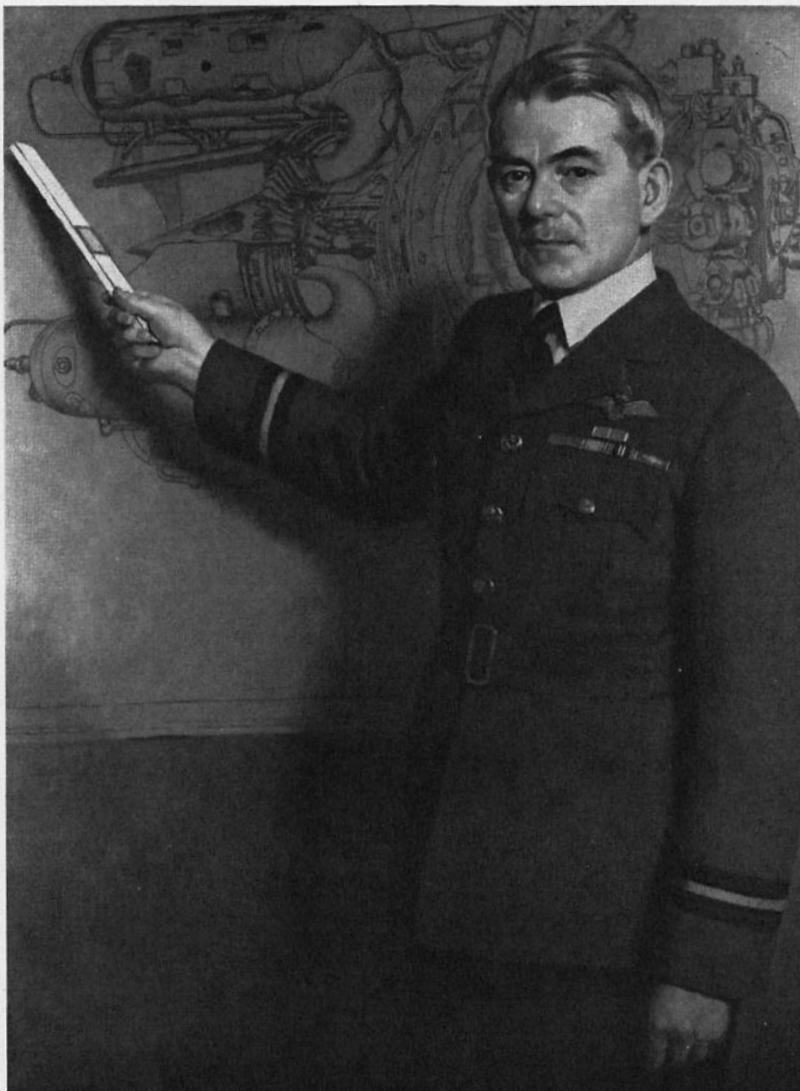


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January 1970 - Lead Article (1)



AIR COMMODORE SIR FRANK WHITTLE

SPECULATION *

By FLIGHT CADET F. WHITTLE.

I was once asked by an optimistic sub-editor of this magazine for an account of how I intended to reach the moon. I was naturally a little shaken at first, as I have never contemplated leaving this homely planet, but, thinking that I might write a little light fiction, I promised; only to find that I cannot rise to the level of Verne or Wells. It, however, caused my thoughts to soar above the tropopause (for the benefit of those who have never been initiated to the mysteries of meteorology, the tropopause is that altitude above which the temperature of the atmosphere remains constant), and the following speculation is the result.

The trans-Pacific flight marks the greatest step in aviation to date, yet it is little more than a score of years since the crossing of the Channel by air was acclaimed as a marvellous feat. There is no reason to suppose that this progress is going to cease, and it is my intention to discuss possible lines of future development. We are not yet satisfied. We want greater range, greater speed, better freight-carrying ability, and more economical air travel.

The formula connecting distance which may be flown with the characteristics of an aeroplane using petrol is

$$R = 2800 (\eta \psi \gamma \text{ Log. } \left[1 + \frac{\omega}{W} \right])$$

where R is the distance in miles which may be travelled in still air, by an aeroplane of weight W lbs. (without fuel) carrying ω lbs of petrol ;

(η) is the thermal efficiency of the engine ;

ψ is the airscrew efficiency ;

γ is the lift drag ratio of the whole aircraft.

It may be seen that R will be decreased by increasing the speed of a given aeroplane beyond that for its incidence of maximum Lift / Drag ratio, as the rapid increase of passive drag would cause a decrease of γ .

It may also be seen that as R is in air miles, the actual range depends upon the winds encountered. Now above the tropopause (about 35,000 feet) such things as depressions do not exist, because this region is isothermal, consequently there are no convection currents. Therefore winds, if any, will be of constant value.

There is another case for high altitude flight. The density of the atmosphere falls off very rapidly with altitude, and for an aeroplane flying at a given incidence (its best) at any altitude,

its speed in level flight must be $\sqrt{\frac{\rho_0}{\rho_H}} V_0$, where V_0 is its speed at ground level for level

flight, ρ_0 is the ground level density of air, and ρ_H is the density of air at the altitude of flight. As the lift and incidence are the same as for ground level, so also will be the drag. Therefore

$HP_H = \sqrt{\frac{\rho_0}{\rho_H}} HP_0$, where HP_0 and HP_H are the horse power for level flight at ground level, and the power for level flight at that altitude respectively. Similarly, as the air forces on

the airscrew will be the same, $N_H = \sqrt{\frac{\rho_0}{\rho_H}} N_0$ where N_0 and N_H are the rate of rotation

* This article first appeared in the 'RAF Cadet College Magazine,' Autumn 1928.

January 1970 - Lead Article (2)

of the airscrew at ground level and at that altitude respectively.

The value of $\sqrt{\frac{\rho_0}{\rho_H}}$ is given by the curve (Fig. 1).

This curve clearly shows that the most efficient method of obtaining great speeds is to attain great altitudes, as an increase of speed obtained through altitude does not mean an increase of landing speed.

For example, an aeroplane at 80,000 feet must go five times as fast as at ground level. The HP necessary for level flight must also be five times as great, so also must the airscrew revolutions.

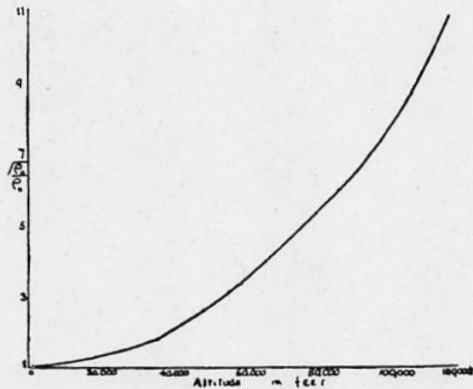


Figure 1

Example :—

Aircraft weight 2,000 lbs fully loaded.

Overall L/D of 10.

Air speed 60 mph at ground level.

Drag will be $\frac{2,000}{10} = 200$ lbs.

Speed is 60 mph = 88 fs.

∴ HP for level flight = $\frac{88 \times 200}{550} = 32$.

At 80,000 feet this machine would fly at 300 mph for the same incidence and would require 160 HP for level flight.

The reasons why we cannot yet reach these altitudes are :—

(1) The engine speed is limited, and thus the only method of obtaining the extra airscrew speed would be by gears.

(2) The tip speed of an airscrew is given by $\frac{V}{P} \times \pi D$, where V = velocity of aeroplane in ft / sec, P is practical pitch of air-screw in feet, D is airscrew diameter in feet. It has been found by wind channel research that the efficiency of an airscrew falls off as the tip speed approaches

1,100 fs, therefore for great speeds $\frac{P}{D}$ must be greater than one, and efficiency falls off for increasing values of $\frac{P}{D}$.

(3) The present type of aero engine depends for its power on the weight of mixture it takes into its cylinders per unit time, and as practical limitations prevent the increasing of revolutions as the density of the atmosphere decreases, a supercharger must be used which will supercharge the air to ground level density to maintain full power. A supercharger which will cope with the rarified atmosphere of great altitudes without absorbing much power has not yet been devised.

Even if winds do exist at these altitudes, their effect on aircraft would be very much less than at ground level. For instance, a 100 mph wind against a machine travelling at 300 mph at 80,000 feet would have the same effect as a 20 mph wind against the same machine doing 60 mph at ground level.

If such advantages are to be attained by high altitude flight, how are we going to overcome the difficulties which prevent it ? The solution seems to me to be the development of a more suitable power unit.

We have heard much recently about the rocket-driven car, and of proposals for an aeroplane to be driven on the rocket principle. The principle is this :—If gases be ejected from rest, under pressure in a chamber, through a nozzle, there is a reaction equal and opposite to the force giving the gas its kinetic energy in the nozzle. Now suppose W lbs of gas per second pass through nozzle with a final velocity V fs. Then the force exerted on the gas, and therefore the reaction = $\frac{W}{g} V$ lbs. The kinetic energy per second given to gas by heating agent = $\frac{W}{2g} V^2$ ft lbs — ie,

power given to gas = $\frac{W}{2g} V^2$ ft lbs / sec. Now if the vehicle being driven in this manner has a

velocity v.f.s. in the direction of the reaction, then the power for driving

= Reaction \times v ft. lbs / sec = $\frac{W}{g} Vv$ ft lbs per sec.

Efficiency = $\frac{\text{Output}}{\text{Input}} = \frac{W}{g} Vv \div \frac{W}{2g} V^2 = \frac{2v}{V}$

Now suppose we want a thrust of 200 lbs and we can at most pass 1 lb of gas per second through the nozzle.

Then $200 = \frac{W}{g} V = \frac{1}{32} V$

∴ Velocity of gas = 6,400 fs
and the efficiency of the "engine"

= $\frac{2v}{6,400} = \frac{v}{3,200}$

where v fs is the velocity of the object being propelled. Thus in this particular case, we should require 1 lb of rocket mixture for every second of flight, and even if the velocity were as great as 300 mph — ie, 440 fs — efficiency would only be $\frac{440}{3,200} = 13.7\%$.

The rocket principle is obviously impracticable unless one applies it to a rotating nozzle where high linear speeds are possible ; then one is, of course, approaching the principle of the turbine, which I now propose to discuss.

January 1970 - Lead Article (3)

The steam turbine is the most efficient prime mover in common use. It has a high thermal efficiency compared with the aero engine and is a smoother running machine. Of course, a steam turbine is out of the question for aircraft owing to the enormous weight, but there seems no reason why an air turbine should not be developed, with petrol or crude oil as the heating agent. In the case of an air turbine the heating agent may mix directly with the working agent and thus exhaust via the nozzles. There being no heat wasted in flue gases, an air turbine should have a greater thermal efficiency than a steam turbine.

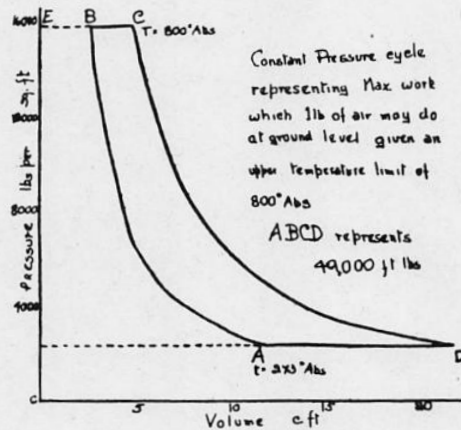


Figure 2

The cycle is shown in the two examples, Figs 2 and 3, which are actual constant pressure cycles for 1 lb of air at ground level (Fig 2) and at 115,000 feet (Fig 3).

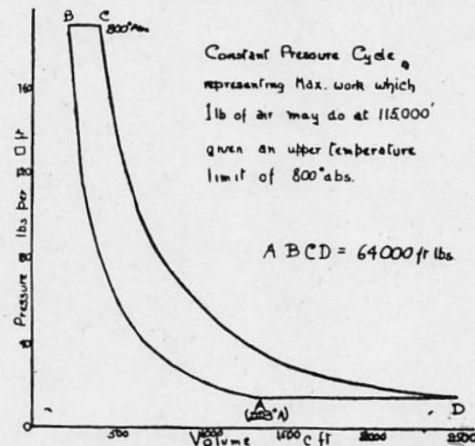


Figure 3

Air is compressed adiabatically AB. It then passes into a heating chamber and is heated at constant pressure BC. It then passes through the nozzles, expanding adiabatically CD, and finally cools at atmospheric pressure outside the engine DA.

The efficiency is given by $\eta = 1 - \frac{1}{R^\gamma - 1}$, where R is the compression ratio.

The velocity of the gas at the nozzles, on which depends the most efficient velocity of the turbine rotor [the most efficient velocity of the turbine blades = $\frac{1}{2} V \cos \alpha$, where V is velocity of gas at nozzle, and α is the angle that the axis of the nozzle makes with the rotor] is such that the kinetic energy of the gas equals the area ECDF (Fig. 2); thus the power of the turbine is not dependent on the rpm.

The power is given in the particular cases shown by

$$\text{IHP} = W \times \text{area ABCD} \div 550,$$

where W is the weight of air undergoing the cycle per second.

The maximum work which 1 lb of air may be made to do is only limited by the maximum temperature which the materials of the heating chamber will stand and the temperature of the atmosphere.

Maximum work = $336 (\sqrt{T} - \sqrt{t})^2$, where T is the maximum temperature (absolute) and t is the atmospheric temperature (absolute).

The idea as a whole is very similar to the steam turbine, the differences being that air is pumped adiabatically into a heating chamber, where it mingles with a burnt petrol-air mixture instead of water being boiled. As far as the nozzles and rotor are concerned, such an engine would be similar to the steam turbine.

The advantages of such a power unit may be stated as follows :-

- (1) The only limit to the compression ratio is the maximum temperature which the heating chamber may stand.
- (2) Power is not dependent on r.p.m., as in the case of the petrol engine.
- (3) The work which may be done by 1 lb of air increases with altitude, and partly compensates for the smaller quantity of air available.
- (4) Supercharging does not appear to be necessary.
- (5) Rotors of different diameters may be used to act as gearing.

The main disadvantage as far as air work is concerned is the gyroscopic effect of the rotors, but on reviewing the points for and against it seems as though the air turbine is the aero engine of the future.

January 1970 - Lead Article (4)

COMMENT ON SPECULATIONS OF 1928

by AIR COMMODORE SIR FRANK WHITTLE, KBE, CB, MA, ScD, FRS, C.Eng, RAF (Ret'd)

The Editor has asked me to agree to the re-publication of 'Speculation' which appeared in the College Magazine for the autumn of 1928 shortly after I had graduated from the College. He also asked me to write a similar article giving my present views about the future. However, I felt obliged to excuse myself from the latter on the ground that, though I have kept in general touch with aeronautical engineering over the past few years, I have been mainly concerned with oil well engineering, and I would need to do a lot of brushing up to attempt such a task. Moreover, the thought was in my mind that one can stick one's neck out a long way as a Flight Cadet aged 21 and get away with it, but I cannot do that today with impunity. Inter alia, there is too big a risk of inadvertently forecasting things which may already be on the drawing board and under security wraps. That could lead to awkward questions as many would assume that I am 'in the know' when, in fact, I am not. I have run into this difficulty in the past. For example, in 1943 I wrote a paper on probable developments in submarine design which was submitted to the Admiralty. A few years later (long after the war) I requested permission to publish. This permission was granted but only subject to important deletions, because I was rather too close to secret work then in progress. However, I agreed to the re-publication of 'Speculation' and to write this commentary on it.

I fear it was a very amateur effort, but I suppose it has some historical value because — so far as I recall — it was the first article on a technical subject by me to be published. It was a condensation of part of my fourth term thesis "Future Developments in Aircraft Design."

Unfortunately, it was marred by printing errors to such a degree that it was probably only comprehensible to anyone so familiar with aerodynamic and thermodynamic theory that the mis-prints would have been obvious. The proofs were never submitted to me for correction, so I cannot wholly be blamed for the apparent errors though, undoubtedly, my handwriting was largely at fault. Generally speaking, the errors took the form of the Greek letter 'rho' appearing as 'P'; the Greek letter 'gamma' appearing as 'Y'; indices appearing as coefficients; + signs instead of the word 'and'; 9 for the symbol 'g' etc. eg

$$\sqrt{\frac{P_0}{\rho_H}} \text{ appeared as } \sqrt{\frac{P_0}{PH}}$$

As may be seen, I looked into the possibilities of rocket propulsion and into propellers powered by internal combustion turbines — it had not then occurred to me that the gas turbine was the best way of producing a propelling jet (for aircraft propulsion at least). The penny dropped just over a year later, by which time I had raised my sights to speeds of the order of 500 mph.

Though I did not know it at the time, the first formula in the article (for range) was a form of the Breguet Equation (the figure 2,800 was the calorific value of petrol in foot pounds per pound divided by 5,280 — to convert feet into miles). It can be applied to jet aircraft by the substitution of the appropriate efficiencies.¹ The formula tends to ignore climb and descent — I

¹ It is now often written in the form

$R = \frac{V}{f} \frac{L}{D} \text{Log} e \frac{W_1}{W_2}$ where V is flight speed (mph if R is in miles or knots if R is nautical miles); f is specific fuel consumption in lbs / hr / lb of thrust; W₁ is all up weight at beginning of cruise and W₂ is all up weight at end of cruise.

probably assumed that the extra fuel required for climb was compensated for by fuel saved on descent. It also requires that the flight condition is at constant lift / drag ratio ie, at constant incidence, which implies a gradual climb as the weight is reduced by fuel consumption. I did not then foresee that traffic control requirements would usually prevent adherence to this optimum flight plan. (With jet aircraft one must fly at a speed somewhat higher than that for maximum L / D because as the thrust of a jet engine varies only slightly with speed at cruising speeds any attempt to fly at maximum L / D — ie, minimum drag — would mean that the slightest deceleration would result in the drag becoming greater than thrust, thus causing further deceleration)²

My views about conditions in the stratosphere were distinctly optimistic but I could not know this as no-one had ever been there nor, so far as I knew, had anyone devised any means for regular exploration of the stratosphere. Such things as jet streams had yet to be discovered as also the fact that the tropopause is very much higher in the lower latitudes (I have seen cumulonimbus towering many thousands of feet above when flying across the Caribbean at 35,000 feet).

The discussion of propulsion by rocket leaves a great deal to be desired, but I was, of course, thinking only in terms of aircraft propulsion. (I think I would have been as disbelieving as anyone if someone had suggested that man would set foot on the moon within 31 years). I remember being very uneasy at the expression I derived for the efficiency of rocket propulsion because of the implication that if the flight speed became more than half the jet velocity, the efficiency would exceed 100% which is improbable to say the least of it. However, this condition would have meant flight speeds more than seven times greater than the 300 mph I was considering. I must have decided not to worry about such a seemingly remote possibility. One of the things I did not take into account was the work done in imparting kinetic energy to the vehicle in addition to overcoming drag. A satisfactory definition of the efficiency of rocket propulsion still seems to me to be a somewhat elusive thing.

The discussion of the gas turbine in the latter part of the paper is, I fear, very amateurish. It is evident that I was thinking only in terms of what was then known as the simple impulse turbine of the de Laval type and that I was still far from being familiar with turbine theory. The most serious defect of this section, is that I evidently assumed that the losses in the processes of compression and expansion would be negligible whereas, as I came to realise shortly after, compressor and turbine efficiencies were all important. The low values then usual for rotary machinery of this type was, coupled with the lack of materials capable of withstanding high stresses at high temperatures, the main stumbling block in the several unsuccessful attempts to develop the gas turbine in the early years of the century.

On reflecting on this serious defect in my argument, my embarrassment is somewhat mitigated by the knowledge that I wrote a paper entitled "The Case for the Gas Turbine" while I was a floatplane and catapult experimental test pilot at the Marine Aircraft Experimental Establishment, Felixstowe between January 1931 and July 1932. This paper was never published but, though I had still to receive my engineering training at Henlow and Cambridge, it shows that I

² When I embarked on the task of finding a range formula I fully expected to find that great increases of range could be obtained by flight at great altitudes and my disappointment was great when I was forced to accept that maximum still air range was independent of height.

January 1970 - Lead Article (5)

had greatly advanced in my knowledge of gas turbine theory and had acquired a much more realistic approach and become well aware of the importance of component efficiencies and the need for suitable turbine blade materials. By that time I was, of course, concentrating on the jet engine application of the gas turbine.

The advantages as listed at the end of 'Speculation' also show that my ideas were still somewhat nebulous. The first would have been better stated as "The limiting pressure ratio is governed by the component efficiencies and the maximum cycle temperature which available materials will permit." Item (2) is wrong. I was evidently thinking of steam turbine characteristics. Even so it should have read "Power is not as dependent on rpm". However, as everyone now knows, when the compressor is driven by the turbine, power is in fact far more sensitive to rpm than in the case of the piston engine. (The static thrust of our first flight engine — the W1 — was 860 lbs at 16,000 rpm, 1,000 lbs at 17,000 rpm and 1,240 lbs at the full design speed of 17,750 rpm.)

Item (3) was (and is) quite sound and becomes even more true when compressor and turbine losses are taken into account. Item (4) also proved to be sound in the event, but I cannot remember what I had in mind when I included (5). I am also puzzled by the fact that I did not include the advantages of low weight, absence of vibration, insensitivity to fuel type etc. However, a year or so later I was in the habit of including these.

The formula given for the maximum work per lb of air per second for a constant pressure cycle (the last formula in the article) looked very unfamiliar and I thought that there must be quite a serious misprint but on checking I found that, except that the coefficient 336 (the specific heat of air at constant pressure in ft lbs per lb) appeared as 356 it was correct for the ideal cycle. In later years I would have preferred it in the form

$$w_{\max} = K_p T_o \left[\sqrt{\frac{T_m}{T_o}} - 1 \right]^2 \text{ where } w \text{ is the work/lb of air/sec, } K_p \text{ is the}$$

specific heat at constant pressure, T_m is highest cycle temperature and T_o is lowest cycle temperature (ie atmospheric static temperature in an open cycle engine).

A particularly interesting thing about this formula is that it indicated the beginning of a very useful line of reasoning. As time passed I acquired the habit of dealing with thermal cycles almost entirely in terms of absolute temperatures, temperature ratios and pressure ratios. Included in this system was the practice of thinking of velocities in terms of temperature equivalents and vice versa. (The conversion is given by $V^2 = 2 g K_p \Delta T$ where ΔT is the temperature change corresponding to velocity V . It happens that $\sqrt{2 g K_p}$ has the same digits as the factor for conversion of mph into fps — 1.47 — hence the useful rule that kinetic temperature rise in °C is equivalent to the square of the speed in hundreds of miles per hour, eg, if air travelling at 500 mph is brought to rest the temperature rise is 25°C ; for 1,000 mph it is 100°C and so on—hence the problems of kinetic heating which arise at very high Mach numbers).

In detail design one has to allow for a number of minor factors such as increase of specific heat with temperature, the fact that the mass flow in expansion is greater than the mass flow in compression due to the added fuel mass etc., but these secondary 'adjustments' can be ignored for the purpose of preliminary design and especially for comparative purposes when seeking the optimum cycle for any particular application. With this system it is possible to 'work round' a jet engine cycle in a matter of three or four minutes after a little practice.

When compressor and turbine losses are taken into account the above formula for w_{\max} becomes modified to

$$w_{\max} = K_p T_o \frac{T_o}{\eta_c} \left[\sqrt{\eta_c \eta_t \frac{T_m}{T_o}} - 1 \right]^2 \text{ where } \eta_c \text{ is compression efficiency}$$

and η_t is expansion efficiency. This condition occurs at a temperature ratio $r = \sqrt{\eta_c \eta_t \frac{T_m}{T_o}}$

eg, for standard sea level conditions ($T_o = 288^\circ\text{K}$) with $T_m = 1100^\circ\text{K}$, $\eta_c = 0.86$, $\eta_t = 0.90$ the value of r for w_{\max} is 1.72 which gives $w_{\max} = 58,200$ ft lbs/lb or 106 hp/lb/sec. Thus the mass flow of air for 10,000 hp would have to be 94.3 lbs/sec.

Unfortunately, the temperature ratio for highest overall efficiency is substantially higher (about 2.1) so that peak efficiency can only be obtained at the sacrifice of output per unit flow, and vice versa.

In practice η_c decreases as temperature ratio (and therefore pressure ratio) is increased but η_t increases. Both effects are due to the conversion of losses into heat during the compression and expansion processes.

Well ! there is my apologia. If I did drop a few bricks, I can claim that I picked them up again a short time later and learned quite a lot in doing so.

When I look back-over the years I am struck by my own relative pessimism at a time when others thought me a wild optimist. The power, size, reliability and performance of jet aircraft have gone far beyond anything I ever predicted. I was, however, usually over optimistic about time and cost, though, in my opinion, my estimates of time **could** have been achieved. For example, there was no serious obstacle to the introduction of the large by-pass ratio turbofan about, say, 1946 or the successful achievement of supersonic flight at about the same time. Unhappily, the contracts for our large by-pass ratio engine (the LR1) and for the Miles M52 experimental supersonic aircraft were cancelled.

December 1970 - Lead Photo



*Her Majesty Queen Elizabeth II, Commandant in Chief of the Royal Air Force College
inspecting the Ceremonial Parade held in her honour 12th June, 1970*

December 1970 - Forward

Foreword by

THE COMMANDANT OF THE ROYAL AIR FORCE COLLEGE
AIR VICE-MARSHAL F. D. HUGHES, CBE DSO DFC AFC MA

In writing this brief foreword to the Fiftieth Anniversary edition of the Royal Air Force College Journal, I am privileged to find myself in very distinguished company.

In September, 1920, when the 'Royal Air Force Cadet College Magazine' first appeared, Lord Trenchard wrote the following words :—

' I hope this magazine will live and prosper . . . '

That it lives is self-evident; that it has prospered is reflected in its circulation of four thousand copies, distributed throughout the world to the military academies of many nations, to academic institutions and of course to Old Cranwellians serving and retired wherever they may be.

Wherever it is read the Journal reflects the ideas, attitudes and way of life of the Royal Air Force College. As the College enters its fifty-first year our task and the way we accomplish it are as vital as ever to the Royal Air Force and to the nation. The chronicle of our efforts and achievements will be provided, as ever, by the Journal, and I wish it every success in fulfilling this valuable role in the years to come.

December 1970 - Good Will Messages

50 YEARS AGO *Royal Air Force Cadet College Magazine*

VOL. I.]

SEPTEMBER, 1920.

[No. 1.

This is the first number of the ROYAL AIR FORCE CADET COLLEGE MAGAZINE, and I would like to write a few words.

I hope this magazine will live and prosper, and be a great help in forming and guiding the destinies of this College.

It was decided to form this Cadet College because it was realized from the first that such a College was the essential foundation of a separate Air Service. This College, in conjunction with the School of Technical Training for boys at Halton, will have the making or marring of the future of this great Service, which was built up during the war by all the gallant Pilots and Observers and other ranks who fought through it, and won a name in the air second to none in the world. It always held, and finally conquered completely, the German Air Service. If it is to continue its great work, which I am convinced we all intend that it shall do, we all realize that it has to live up to its war reputation, and we must ensure by every means in our power that it does so.

We have to learn by experience how to organize and administer a great Service, both in peace and war, and you, who are at present at the College in its first year, will, in future, be at the helm. Therefore you will have to work your hardest, both as Cadets at the College and subsequently as officers, in order to be capable of guiding this great Service through its early days, and maintaining its traditions and efficiency in the years to come.

H. TRENCHARD.

It pleases me very much to think that the R.A.F. Cadet College is to have a magazine of its own, and I hope that it will achieve the most complete success.

The Chief of the Air Staff has already sent you a message, the sentiments expressed in which I entirely endorse.

Nothing that has ever happened in the world before has offered to man such an opportunity for individual personal prowess as the air fighting of the Great War. Fiction has never portrayed such extraordinary combats, such hairbreadth escapes, such absolute superiority to risk, such dazzling personal triumphs. The devotion and courage of the airman was no higher than that of his comrade on the land or on the sea; nor were his trials or sufferings greater. But the battle to the death in the high air called forth a combination, for the purposes of war, of spirit, eye, and hand more complete and more harmonious than any previously believed to be within the range of human nature.

It is to rival, and no doubt to excel, these feats of your forerunners in the Service that you are now training yourselves, and I, for one, look forward with confidence to the day when you who are now at the College will make the name of the Royal Air Force feared and respected throughout the world.

WINSTON CHURCHILL.



THE CHIEF OF
THE AIR STAFF,
AIR CHIEF MARSHAL
SIR JOHN GRANDY,
GCB KBE DSO RAF

It is a great pleasure for me to contribute a foreword to the 50th Anniversary Edition of the College Magazine.

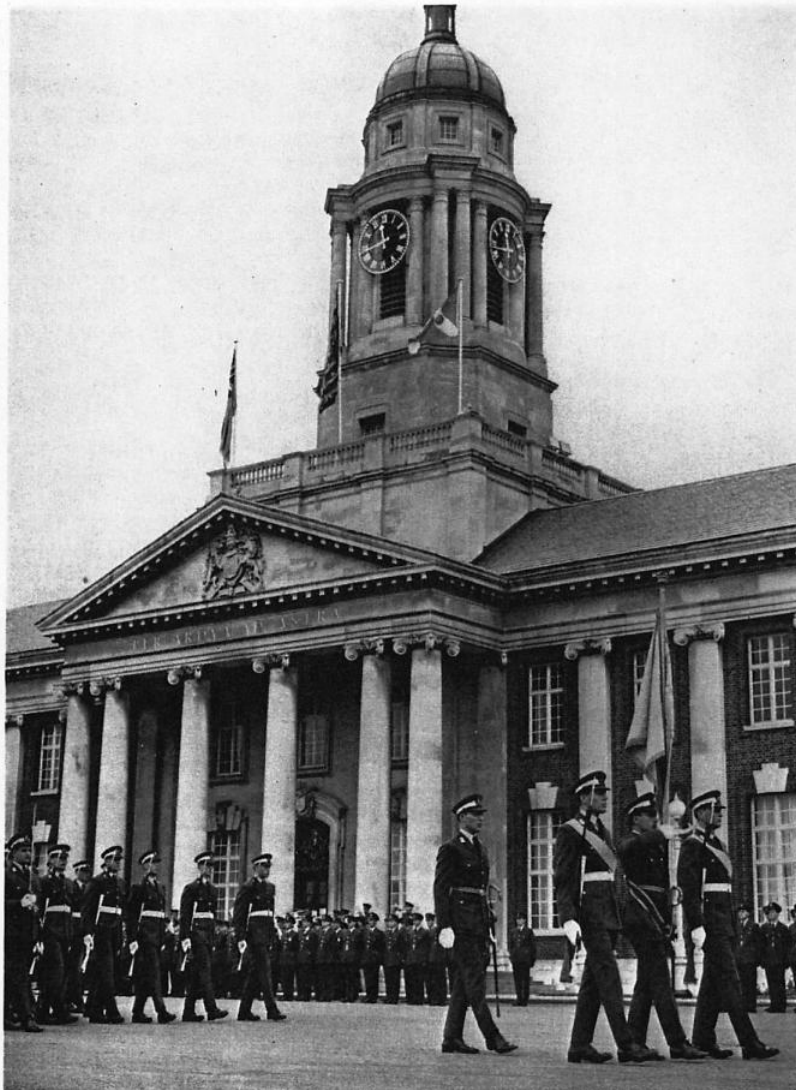
Lord Trenchard founded this College to meet the challenges of a young Service. He realised that, above all, the Royal Air Force needed officers with imagination and flexibility of mind to understand the potential of air power — and the determination to apply what they believed. These qualities had to be developed from the earliest days of training and this is what Cranwell geared itself to do. In meeting this responsibility Cranwell has faithfully reflected the spirit on which the Royal Air Force has been built.

The fighting traditions of the Royal Air Force in two world wars have been second to none. But we have also forged a reputation in peace no less to be admired and on which our traditions can continue to flourish. During the second 25 years of Cranwell's life our country has not been involved in any major war, but the Royal Air Force has nevertheless taken part in a large number of diverse operations, large and small, on many fronts worldwide. No doubt there will be others as the second fifty years of Cranwell's life unfold.

Cranwell training has undergone many changes during the last few years. The Service is ever ready to accept the need to introduce change and to adjust to changing circumstances. This is one of our strengths; one which Cranwell itself has always recognised.

Those at Cranwell today are fortunate to be there during this historic year. I wish you all every success in the splendid life you have chosen.

December 1970 - 50th Anniversary (1)



Ceremonial Parade : The Queen's Colour being paraded in slow time.



50TH ANNIVERSARY

Visit of

HER MAJESTY
THE QUEEN

and

HIS ROYAL HIGHNESS
THE DUKE OF EDINBURGH
to the
ROYAL AIR FORCE COLLEGE

Cranwell

12th June, 1970

December 1970 - 50th Anniversary (2)

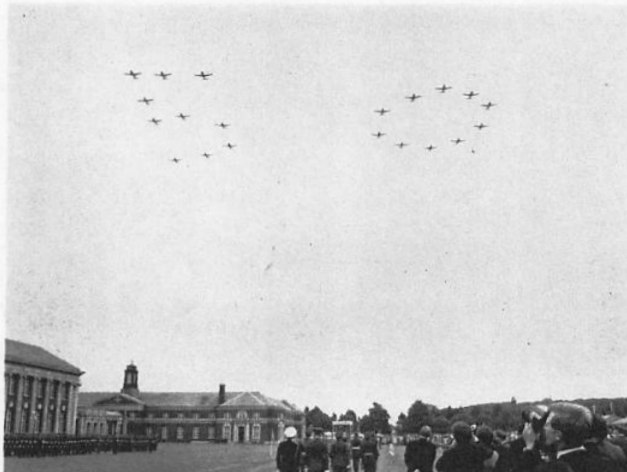
THE ROYAL VISIT

At 1120 hours on the morning of Friday, 12th June, 1970, the Royal Standard was broken simultaneously at the College flagmast and at Station Headquarters, to mark the arrival of the Royal Aircraft bringing Her Majesty the Queen and His Royal Highness the Duke of Edinburgh to Cranwell on a Royal Visit to commemorate the fiftieth anniversary of the founding of the Royal Air Force College.

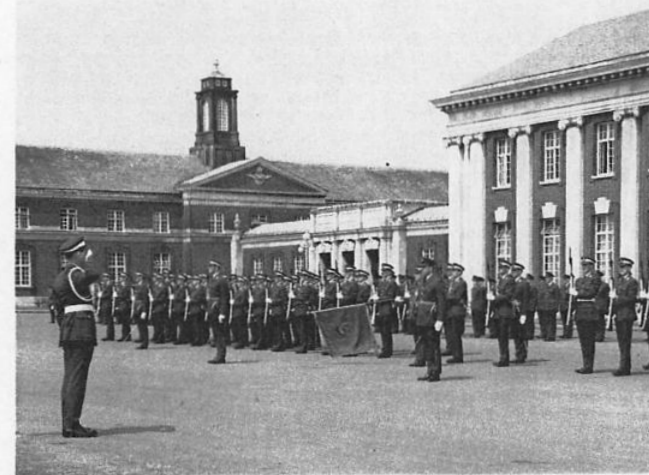
The Royal Party was received at the airfield by the Earl of Ancaster, TD, JP, Her Majesty's Lieutenant for the County of Lincolnshire, who presented the following officers to Her Majesty :

Air Chief Marshal Sir John Grandy, GCB, KBE, DSO, Chief of the Air Staff.
 Air Marshal Sir Leslie Mavor, KCB, AFC, Air Officer Commanding-in-Chief, Training Command.
 Air Marshal Sir Andrew Humphrey, KCB, OBE, DFC, AFC, Air Member for Personnel.
 Air Vice-Marshal F. D. Hughes, KCB, DSO, DFC, AFC, MA, Air Officer Commanding and Commandant, Royal Air Force College.
 Air Commodore J. E. Bazalgette, DFC, MBIM, Assistant Commandant (Cadets) Royal Air Force College.

The official reception over, the Royal Party then drove to the Orange for the Ceremonial Parade. As the Queen, escorted by the Commandant and the Duke of Edinburgh accompanied by the Assistant Commandant approached the dais, Jet Provost aircraft flew over in '50' formation. Her Majesty was received by a Royal Salute and was then invited by the Parade Commander to inspect the Parade. The College is honoured in having Her Majesty the Queen as its Commandant-in-Chief and on this occasion the Queen's Colour Escort Squadron was formed of Flight Cadets with Officer Students forming two supporting squadrons.



The Royal Party arrives at the Parade Ground as the '50' formation flies in salute overhead.



The Ceremonial Parade — 'Royal Salute'

COMPOSITION OF THE CEREMONIAL PARADE

Parade Commander	Flying Officer R. W. Hooper
Parade Adjutant	Flying Officer R. J. C. Dawson
Parade Warrant Officer	Warrant Officer J. Garbet

COLOUR PARTY

Colour Bearer	Under Officer C. J. Kennedy
Escorts	Flight Cadet C. D. Poate
	Flight Cadet I. S. Cartwright-Terry
Colour Warrant Officer	Senior Flight Cadet I. D. Vacha

ESCORT SQUADRON

Commanding	Senior Under Officer D. J. Edington
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No 1 SUPPORT SQUADRON

Commanding	Flying Officer J. M. Joint
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No 2 SUPPORT SQUADRON

Commanding	Pilot Officer D. S. Pollard
Commandant's Orderlies	Flight Cadet I. P. Burn
	Flight Cadet H. G. Britten-Austin

The Student Officers and Flight Cadets of the
 ROYAL AIR FORCE COLLEGE

THE BAND OF THE ROYAL AIR FORCE COLLEGE

The Director of Music	Flight Lieutenant D. S. Stephens, LRAM, ARCM, BBCM
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December 1970 - Letter from HM The Queen



BUCKINGHAM PALACE

13th June, 1970.

My dear Commandant,

The Queen, as your Commandant-in-Chief, has asked me to convey to you and to all at The Royal Air Force College, Cranwell, her warm appreciation for a splendid day on the occasion of the Golden Jubilee of the College. Her Majesty was most impressed by the outstanding smartness of the parade and wishes to congratulate all those concerned.

The Queen and The Duke of Edinburgh were delighted to have this opportunity of seeing so much of the College and of meeting so many former members, staff, student officers and cadets. They greatly enjoyed the static and flying displays and an excellent lunch, and were very pleased to see St. Michael's Church. I have written separately to Marshal of the Royal Air Force Sir Dermot Boyle to convey Her Majesty's thanks for the lovely silver chalice from The Old Cranwellian Association.

The Queen has also asked me to say how pleased she is that The Prince of Wales will be joining the College next year.

*Signed - Yours sincerely
Philip Moore*

December 1970 - Passing Out 98 Entry (1)

THE GRADUATION OF No 98 ENTRY

The Graduation Parade of No 98 Entry took place on the morning of 31st July, 1970. The Reviewing Officer was Marshal of the Royal Air Force Sir Dermot Boyle, GCB, KCVO, KBE, AFC. The parade was commanded by Senior Under Officer D. J. Edington and the Parade Adjutant was Senior Flight Cadet J. Harrington. The Sovereign's Squadron was commanded by Senior Under Officer C. D. O'Connell and Number 3 Squadron was commanded by Under Officer A. J. Gatland.

After the Advance in Review Order, the Reviewing Officer presented the Sword of Honour to Senior Under Officer D. J. Edington, the Queen's Medal to Senior Flight Cadet J. Harrington and the R. M. Groves Memorial Prize and Kinkead Trophy to Under Officer A. J. Gatland. He then gave the following address :

Gentlemen,

This is the second occasion on which I have had the honour and pleasure of being the Reviewing Officer of a Graduation Parade at this College. Last time it was 14 years ago and I was Chief of the Air Staff. Today it is in your 50th Anniversary Year.

Forty-six years ago yesterday I myself graduated on one of these parades. The Reviewing Officer then was Field Marshal Sir William Robertson and I see from the record that he then said to us that we belonged to the First Service of the three Fighting Services, and that everyone thought that the next war would be to a great extent decided in the air. This showed great realism and foresight on Sir William's part ; but, unfortunately, at that time very few people saw things the way he did.

I've had a fairly long and continuous association with this College for 48 years of the 50 years of its existence, and there is one simple practical point which I have learned in that time. That is — that here and now is not the time and place to expect any of you to remember anything that anyone standing here might say to you. According to the history books I heard Lord Trenchard say certain things when I was on parade here as a cadet which ultimately affected me. I wouldn't like to cross swords with the historians, but all I can tell you in absolute honesty is that I do not remember hearing these things. I was thinking about much more important, much more immediate things as you are ; and indeed I was much too modest in those days to believe that anything that Lord Trenchard might be saying about us in general would affect me in particular. When I tell you that was at the end of my first term, you will realise the height of my modesty. I am therefore going to be brief.

My first and most pleasant duty is to congratulate everyone concerned on the excellence of this parade and indeed on all the arrangements surrounding it. The flypast, the timing, on the ground and in the air, the smartness and the justifiable pride which you all show in taking part, whether as the principal performers — the Graduating Entry — or as organisers, parents or spectators ; all proud to be associated with the College — all glad to be here today — a very heart-warming occasion.

At my age and in my position in relation to this College I am going to risk making a suggestion for a small improvement in this parade ; and that is I think it is right that a flypast in honour of this occasion should be properly recognised by a proper salute from the Reviewing Officer — if not also from the assembled company. After all, a lot of skill and effort goes into that flypast, and in addition it is in a sense symbolic. It was flying that brought the Royal Air Force into being. It was because of flying that this College was founded, and it was by flying that the Royal Air Force saved this country from disaster in the last war. Therefore I say — ' Salute the Fliers, and don't forget what we owe them.'

As you will all know only too well, great changes are taking place in the organisation of this College at the present time. Changes are absolutely essential if we are to keep ahead of the changing conditions in which we live. The Royal Air Force has always been forward thinking. In fact the technology in which we operate compels us to be so, but we must try and ensure that in the midst of change we retain the essentials while merely modifying the methods of achieving them.



The Reviewing Officer with Under Officer A. J. Gatland, Senior Under Officer D. J. Edington and Senior Flight Cadet J. Harrington.

December 1970 - Passing Out 98 Entry (2)

There are three essentials as I see it for any cadet graduating from this College. The first is dedication to the Royal Air Force, the Service of your choice. Then full recognition and acceptance of the responsibilities and loyalties which fall to you as commissioned officers. This is of ever increasing importance since these loyalties are increasingly being challenged throughout the world, and finally professional competence in the branch of the Service for which you have been trained. These are the stepping stones to higher rank in the Service, but there is one further very important quality when you reach high rank. That is, that you should be able to argue the Royal Air Force case. Trenchard did this through foresight, faith and determination. He had virtually no proof as to what the air could do but he foresaw quite rightly (as history later showed) what air power — or the lack of it — could mean.

You too, I am sure, have got determination and foresight, but you also have one very great advantage, and that is unlimited proof of the dominant part played by air forces in

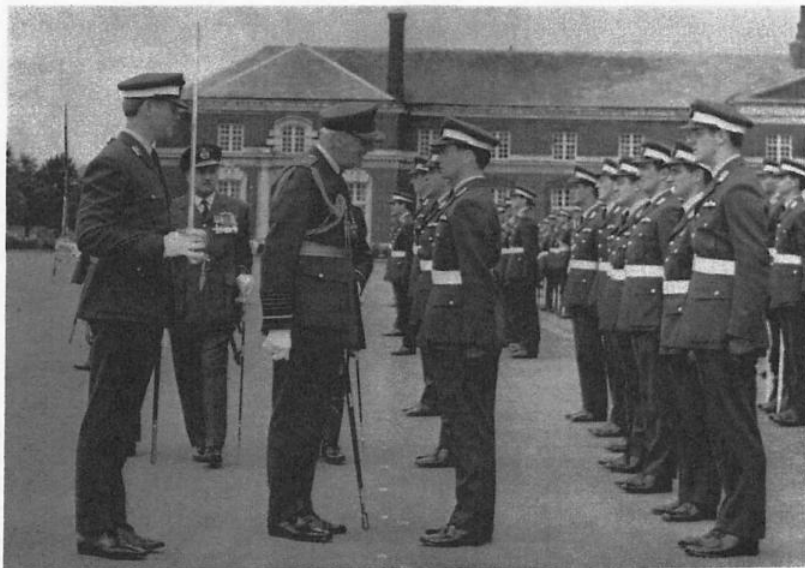
modern war. If you are to be successful as a negotiator for your Service in years to come, you must have all the unanswerable facts and arguments at your fingertips. The Minister of Defence is unlikely to agree to a large expenditure on equipment for the Royal Air Force unless he has first been persuaded by somebody that such expenditure is necessary. We hear much about inter-Service co-operation these days. This is nothing new, but even so I don't think we have reached the stage where we can expect the admirals and the generals to make our case for us, except perhaps in war when driven to it by dire necessity — but then it will be too late !

No, the future of the Royal Air Force must depend increasingly on the graduates from this College and your ability to argue a case that has already been proved beyond doubt in many different theatres of war, but is so easily and so conveniently forgotten in peace time. You've got to be able to re-establish the facts of war in the midst of peace — a difficult and frequently unpopular task.

And now a word for 98 Entry, whose day this is. First of all, my congratulations to you on your showing on this parade. I understand that you've had a very difficult time in the midst of all the changes that have been forced upon you in the last few months, and I also understand that this has not damped your enthusiasm or your unity as an Entry, or your cheerfulness — all valuable qualities — enthusiasm, good humour and comradeship. Perhaps it is not inappropriate for me to remind you that after 50 years of output from this College you follow in the footsteps of a great concourse of men, many of them of outstanding ability — and I am not referring only to those who have publicly made their mark and are known to you all, but rather to the greater number who have never made the

headlines of success, who are probably unknown to most of you, but, in spite of that, were very great men.

Those who have known the output of this College for as long as I have would be able to name dozens of people of the kind I have in mind, and I think it is right for me to remind you of this rich heritage so that you may be proud to succeed them as graduates of this College. You now go out into the Royal Air Force, and, with every sincerity I wish you every success. Ultimately as powerful advocates for the case of your Service ; immediately as dedicated men and experts in your particular Branch ; and always as officers holding the Commission of our Queen and Commandant-in-Chief.



The Reviewing Officer inspecting the Graduation Parade of No 98 Entry.



The Reviewing Officer signing the Visitors' Book.

December 1970 - Passing Out 98 Entry (3)

THE WINGS AND PRIZES CEREMONY

Presentations of Wings and Prizes to No 98 Entry were made by the Commandant, Air Vice-Marshal F. D. Hughes, CBE, DSO, DFC, AFC, MA, in the Whittle Hall on 30th July, 1970. After making the presentations, Air Vice-Marshal Hughes addressed his audience :

It gives me great pleasure to welcome all our guests to this Wings and Prizes Ceremony. I am especially grateful to those of you who have come long distances, often at considerable personal inconvenience, to be here for our two days of celebrations. I do assure you that your presence adds enormously to the occasion. It also allows me to thank you all for the support and encouragement you have given to your young men throughout their stay with us. My son came through Cranwell on 84 Entry and I well know how much parents become personally involved in their off-springs' progress. I do look forward to having you with us tomorrow, and will share your moment of emotion and pride as we see them slow-march off the parade ground to become holders of Her Majesty's Commission.

You will have observed that the three major prizes remain for presentation on the parade tomorrow. However, I am sure you would like to join with me now in congratulating the winners :

The Groves Memorial Prize and its conjoint Award, the Kinkead Trophy : Under Officer A. J. Gatland.

The Queen's Medal : Senior Flight Cadet J. Harrington.

The Sword of Honour : Senior Under Officer D. J. Edington.

Those prizes will be presented tomorrow by Marshal of the Royal Air Force Sir Dermot Boyle, our distinguished senior Old Cranwellian, and this ceremony serves to mark another important event in our Golden Jubilee Year at the Royal Air Force College.

Sir Dermot has had a very full and — need I say it — highly successful career. He passed out from Cranwell in 1924 and started his flying career on Sopwith Snipes and Woodcocks. After a tour in India he completed the Staff College course before returning to Cranwell as Chief Flying Instructor. He saw war service on Hampdens operating from nearby Scampton and then graduated to duties with the War Cabinet Office. From

here his promotion took him through a succession of important appointments including AOC of No 1 Bomber Group and C in C of Fighter Command, until he became Chief of the Air Staff in 1956. It was during this period that Sir Dermot had to put up with nearly three years of my ministrations as his Personal Staff Officer. In contrast to that severe trial, he had the great pleasure of reviewing a Passing Out Parade at the College when he presented the Sword of Honour to his son, Senior Under Officer Tony Boyle of 67 Entry, C Squadron.

As Patron of the Old Cranwellian Association he has continued to take a close interest in the future of the College and it is our privilege and my own very great pride and pleasure to welcome both him and Lady Boyle to Cranwell immediately after this ceremony.

I see from past Wings and Prizes speeches that on this occasion the Commandant is allowed the unique opportunity of giving an entirely 'captive' audience a few words of advice. This is a tradition I intend to perpetuate.

The first point I wish to bring to your attention is one that I am sure had not escaped your notice. You are starting your commissioned service in the Royal Air Force at a most interesting time in its history. The new aircraft appearing in the front line squadrons such as the Harrier, Nimrod, Phantom and Jaguar will be exciting machines to fly and operate. They bring new weapon systems, new tactics, and of course a host of new problems both tactical and technical. It is these problems that you young men will help to solve. I envy you this opportunity and wish I was starting all over again with you. But to succeed in this very professional force, you must keep abreast of developments. Keep yourselves well informed on strategic matters and scientific advances ; use some of your leisure time to read. Only by this conscious effort will both the Royal Air Force and yourself obtain the best results from our new equipment.

We are also entering a time however when I believe we may once again hear talk of take-over bids for our Service — not necessarily by our Sister Services themselves, but by well meaning but ill-informed economists. Both the Army and the Navy require us to give them aid in war. That aid must be given speedily and effectively. In peacetime, our ability to do this can only be demonstrated in realistic exercises. It therefore behoves us all to ensure that we fulfil any task we should be given in a highly operational and competent manner — and, what is more, we must be seen to understand their problems and have a burning will to solve them. In this way you will prove that the Trenchard doctrine of an independent air force is the just and right one.

My third and final point is that you should strive continually to present the Royal Air Force in the best light to the general public. Past experience shows that, in prolonged periods of peace, the Services tend to be regarded — even by people who should know better ! — as a bunch of idlers who are an unnecessary drain on the nation's resources. The long-outdated image of the officer whose week-ends last from Thursday to Monday, whose working afternoons are concerned chiefly with hunting, shooting and fishing, and whose evenings are devoted to demolishing bottles of port, dies hard. Wherever you may be stationed, make it one of your aims to get to know the locals. With the consummate tact with which you are all endowed, get across to your new friends the fact that the modern Air Force is a highly efficient and professional body of chaps whose global peace-keeping role, within NATO in particular, is essential to the wellbeing of the nation.

Many of you, in a surprisingly short time ahead, will find yourselves moving in high circles, meeting Royalty, Ministers, Ambassadors, rulers of overseas territories, the 'top brass' of foreign armed forces, and local dignitaries here at home. Never forget that it will be by your behaviour on these occasions that the quality and social standing of the Royal Air Force as a whole will be judged. What may appear to you just now as irritating and old-fashioned little social conventions are an essential part of the social scene throughout the civilised world. If you fail to observe them you will soon find yourselves crossed off the local guest lists. This will deny you much

enjoyment — but, far worse, gentlemen, you will have tarnished the image of the Service in which you have been commissioned.

Now what of the gallant 98th ? A quick glance at the statistics shows that they joined in April 1968, 53 strong, and tomorrow we are due to graduate 48. On the surface this would suggest the happy state of affairs that here was an Entry with only some 10 per cent falling by the wayside for one reason or another. Unfortunately, this rosy picture does not stand much examination for this Entry has achieved a remarkably high standard in cross-fertilisation ! Closer scrutiny reveals that no less than 31 per cent of those due to march off parade tomorrow started with 97 Entry and that 98 Entry itself has lost some 40 per cent of its original intake !

But first let us have a quick look at the academic studies. In the Humanities they are assessed as somewhat disappointing. At that stage of development there were no outstanding personalities among its members and they were reported to be somewhat unresponsive to teach, requiring considerable provocation before any positive reaction could be obtained. That, of course, was a year ago — I suspect the provocation 'flash point' has dropped a few degrees by now !

Let's face it, their examination results could have been better. In the final Humanities examination eight cadets failed in Economics, two in War Studies, and one in Associated Studies. All of them, however, by means of the achievement of group passes or by resitting examinations, managed to qualify. But, lest they should think the Old Man is being excessively brutal, I hasten to say that there were some bright spots. Some very good work was done in Associated Studies by Stirrup and Longhurst. Harrington, who gained 80 per cent in his final Economics examination, equalled the record set for the best mark in that examination by Butt of 93 Entry. Harrington, too, won the 1969 Director of Studies Essay prize with a very good piece of work on the Arab-Israeli conflict, and I must also make mention of the very deep research carried out by Salisbury in connection with his study on 'The Negro in America.' Orwell was specially commended for his essay on Russell Braddon's attitude to war ; Roberts passed the Civil Service Com-

December 1970 - Passing Out 98 Entry (4)

mission's Interpretation in German, and Sudlow the Linguist examination in French. In the Royal Air Force Colloquial examination Parsons and Stockill were successful in French and Trewinnard in German.

The Languages Department proved to be a very useful travel agency for flight cadets studying languages. Apart from the usual participation in Inter-College sports visits, no less than six flight cadets managed to arrange 'personal cultural and linguistic detachments' to France and Germany. And judging by the success of certain young men, who went to Salon for the Graduation Ceremony and Ball of our sister French Air Force College, in dancing till dawn with a series of gorgeous 'jeunes filles,' the value of colloquial French is now fully appreciated in some quarters! I'm all in favour of this and congratulate them on their enterprise.

The academic problems however were not confined to the Humanities. No less than 20 flight cadets were involved in Mathematics and Science re-sits, but I am glad to say that 15 of them went on to complete successfully the academic course.

Overall I am informed that the kindest thing that can be said of their performance in this sphere is that they finished the Applied Science much better than they started the Basic Science phase, and made more progress than some recent past entries. As they progress in their careers, however, I am confident that they will come to realise that the general broadening of their horizons by their academic year here will have been most valuable.

In November last year, joyfully shaking off the dust of Whittle Hall, the Entry got off to a steady start with their pilot training. Unfortunately, due to severe winter weather they had fallen 80 hours behind their task by February and, when bad weather dogged their night flying period, they were nearly 400 hours below their target by the end of the Royal Visit. Only concentrated efforts by instructors and ground staff enabled them to complete over half of their flying training in the last three months. The lads responded well to the demands made of them and the Chief Flying Instructor tells me that they really came to life under the stimulus of flying continuity. Piloting ability covered the normal average

band, but four members are to be congratulated on their above average assessments in their final handling tests.

I thoroughly enjoyed helping to judge the Aerobatic Competition. All four contestants put up a spirited performance but, once the judges had done their sums and compared notes, it was a unanimous view that Miller had nosed ahead to collect a well-earned Battle of Britain trophy.

The Entry's professional keenness in the Ground School is well reflected in the Command Examining Board's results which were the highest achieved by any Cranwell course. Their overall average of 77 per cent also follows the example of 96 Entry, being a higher average than the current results obtained at the other two Basic Flying Training Schools. This is a most praiseworthy achievement.

Unlike other specialisations on the course, the Navigator fraternity, having started only three strong at one time, increased their complement to eight by transfers from other entries and branches, and I am glad to say that seven have successfully completed the course. They are adjudged as a lively and interesting group who are well liked by their instructors. Two of them even managed to get me to Berlin and back — though not without drama! Harrington deserves our warmest congratulations on gaining the very rare distinction of an 'Exceptional' assessment at the end of his training.

As there were no Engineering flight cadets on this Entry I can speed straight on to the Supply and Secretarial chaps. The Suppliers (to give them their new title!) were about average in professional studies, but I must congratulate the Secretaries — both of them! — on attaining an above average standard, and also on applying themselves to their professional training with commendable enthusiasm.

The sole Regiment representative — Parsons, whilst not among the prize-winners, achieved the high standard demanded by his Branch and, of course, will be the first man of the Entry to begin productive service. I wish him good fortune in his tour with No 15 Field Squadron. It is sometimes said in Confidential Reports 'This man will go far.' It seems that

Parsons is going farther than most for his first post may be in Hong Kong. Any connection between this and his impersonation of the Senior Regiment Instructor during the Revue last Monday is purely coincidental!

On the square, the Entry has made steady progress in standards of drill and ceremonial throughout the course. They all deserve praise for this but I must make special mention of Edington on his able command of the Escort Squadron during our recent Ceremonial Parade for the visit of our Royal Commandant-in-Chief on 12th June. This took place under the eagle eyes of a record number of Old Cranwellians who were full of praise. Tomorrow will be the last opportunity that you have for demonstrating your prowess in this sphere and, with the Senior Old Cranwellian on the dais, I know you will pull out that last vital stop which makes all the difference between just a good and a truly memorable occasion.

What then of 98's achievements in the field of sport? As with their immediate predecessors, they have tended to shine more in the individual events such as fencing and rowing than in the major team sports. Exceptions to this are of course Edington whom I congratulate on representing Training Command at Rugby and Vacha who also had a game for the Command side.

The fencing accolade must of course go to Gatland. He has represented his own country, New Zealand, and was included in their team which reached the finals of the 1970 Commonwealth Games in Edinburgh. He has also fenced for the Royal Air Force and in slack periods he has proved himself to be an outstanding player in our College Basketball Team. Fencing has been popular with the Entry, for Wilson has also fought for the Royal Air Force, and Mould and Stockill for Training Command.

The 1970 College Swimming Team has enjoyed a most successful season under the leadership of O'Connell who has represented the Royal Air Force at Water Polo. Sharp is also congratulated for his success in representing the Royal Air Force at both Water Polo and Swimming and in gaining a third prize in the Royal Air Force Championships yesterday. Wyer represented Training Command at Basketball, and Kennedy has represented the Royal Air Force at Canoeing

and Rowing. Kennedy's excellent performance in the Canoe Slalom event against Dartmouth this year was largely responsible for our win over the Naval College in this event. Finally, Handfield represented Training Command in Rowing.

To their great credit, 98 Entry have improved in the sporting sphere over their predecessors though their numbers were small; no less than five of them have represented the Royal Air Force. There has been no lack of honest endeavour and they have kept all sports alive. Therefore we must congratulate them on their efforts.

The Entry has felt the first breezes of the 'wind of change' now blowing through Cranwell as it evolves towards becoming a post-graduate training centre. I feel sure that this must account largely for their lack of any shattering impact on the College. They have seen a large slice of 99 Entry go off to University, and may have lacked the stimulus of a Junior Entry to guide and supervise. They have seen the flight cadet population reduce progressively during their time in residence. They have suffered from a spell of bad weather early in their flying programme which caused them to fall well behind the task; this has meant much late evening and weekend flying. They were also faced with the challenge and problems associated with the disappearance of the old A, B, C and D Squadrons and may have felt that this unavoidable upheaval robbed them of their old identity and loyalties.

Despite this, as an Entry they will always be remembered for an excellent spirit of brotherhood which I am sure they will carry forward into their future service. Their combined contribution may not have been outstanding but individually they have contributed much to the continued success of the College. Certainly some quite engaging 'characters' have emerged once Final Handling Tests and similar milestones have been passed!

I would ask you all to take one further thought with you as you proudly pass out from the Royal Air Force College. You are entering a service that relies enormously on teamwork and, in your flights and squadrons your efforts can lead to the success or failure of your particular unit. As Cranwellians, a great deal will be expected of you. You will be

December 1970 - Passing Out 98 Entry (5)

required to be above the average ; if you are not, you may be regarded as a partial failure, perhaps especially by non-Cranwellian commanders. You must set yourselves high standards and persistently strive to achieve them and, by sheer example, encourage your fellow squadron members and juniors to do likewise. Remember, the 'single list' concept is on its way for all the major Branches — the 'Way to the Stars' will be immensely competitive. Your promotion will depend on your annual confidential reports which will probe deeply into every aspect of your activities. I commend to you the occasional study of Form 1369A and a dose of honest self-criticism in its light.

In a lighter vein — in years gone by, the annual confidential report was a much less weighty document and comments by com-

manders were short and sharp. One hard-riding huntin' type is credited with writing : ' I would not breed from this officer.' Another well-beloved officer, one of my distinguished predecessors here, is said to have written : ' I know of no officer I would rather have with me in a tight corner. Unfortunately, I know of no other officer more likely to get me into one ! ' Joking aside, modern comments are even more penetrating !

I congratulate you warmly on reaching the high standards we rightly demand of holders of The Queen's Commission. I wish you a glorious succession of good 1369's. May you all get the squadrons or stations that are your heart's desire, and may you have the best of good fortune in the exciting and rewarding careers which lie before you in the Royal Air Force.



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COMMISSIONING LIST No 98 ENTRY

- | | |
|--|--|
| D. J. EDINGTON, <i>Senior Under Officer (Supply) ; The Sword of Honour and the R. S. May Memorial Prize ; Rugby (Colours).</i> | R. FURLONG, <i>Senior Flight Cadet (Pilot).</i> |
| C. D. O'CONNELL, <i>Senior Under Officer (Navigator).</i> | R. L. GOODISON, <i>Senior Flight Cadet (Navigator).</i> |
| A. G. O. DEE, <i>Under Officer (Pilot).</i> | K. M. GRAHAM, <i>Senior Flight Cadet (Pilot).</i> |
| A. J. GATLAND, <i>Under Officer (Pilot) ; The R. M. Groves Memorial Prize and Kinkead Trophy for Flying ; The Dickson Trophy and Michael Hill Memorial Prize for Applied Flying ; The Alasdair Black Memorial Trophy for General Service Training (shared) ; Basketball (Colours) ; Fencing (Colours).</i> | R. D. GREGORY, <i>Senior Flight Cadet (Pilot).</i> |
| C. J. KENNEDY, <i>Under Officer (Pilot) ; The Philip Sassoon Memorial Prize ; The Alasdair Black Memorial Trophy for General Service Training (shared).</i> | R. HANDFIELD, <i>Senior Flight Cadet (Pilot).</i> |
| B. J. LONGHURST, <i>Under Officer (Pilot).</i> | J. HARRINGTON, <i>Senior Flight Cadet (Navigator) ; The Queen's Medal ; The Institute of Navigation Trophy and the Ministry of Defence (Royal Air Force) Prize for Navigators ; The Ministry of Defence (Royal Air Force) Prize for War Studies and Humanities and The Royal New Zealand Air Force Trophy.</i> |
| W. A. J. MATES, <i>Under Officer (Supply) ; The Ministry of Defence (Royal Air Force) Prize for Supply Flight Cadets.</i> | C. P. HICKS, <i>Senior Flight Cadet (Supply) ; Athletics (Colours).</i> |
| T. J. WOOD, <i>Under Officer (Pilot) ; The Abdy Gerrard Fellowes Memorial Prize for Mathematics and Science.</i> | J. A. D. HOULTON, <i>Senior Flight Cadet (Pilot).</i> |
| A. M. L. BARCROFT, <i>Senior Flight Cadet (Supply).</i> | E. HUNKIN, <i>Senior Flight Cadet (Pilot).</i> |
| J. J. BARNETT, <i>Senior Flight Cadet (Pilot) ; The Hicks Memorial Trophy for Ground School Subjects.</i> | D. J. MATHER, <i>Senior Flight Cadet (Pilot) ; Shooting (Colours).</i> |
| N. BARTON, <i>Senior Flight Cadet (Pilot).</i> | S. B. McBAIN, <i>Senior Flight Cadet (Pilot).</i> |
| A. K. CLARKE, <i>Senior Flight Cadet (Pilot).</i> | K. McGUIRE, <i>Senior Flight Cadet (Pilot).</i> |
| A. DAVIES, <i>Senior Flight Cadet (Navigator).</i> | J. MIDDLETON, <i>Senior Flight Cadet (Navigator).</i> |
| G. P. EVANS, <i>Senior Flight Cadet (Pilot) ; Cross Country (Colours).</i> | A. S. MILLER, <i>Senior Flight Cadet (Pilot) ; The Battle of Britain Trophy for Aerobatics.</i> |
| | S. T. MORRELL, <i>Senior Flight Cadet (Pilot).</i> |
| | S. G. MOULD, <i>Senior Flight Cadet (Pilot).</i> |

December 1970 - Passing Out 98 Entry (6)

S. J. ORWELL, *Senior Flight Cadet (Pilot)*.

R. D. PARRY, *Senior Flight Cadet (Pilot)*.

P. I. PARSONS, *Senior Flight Cadet (Regiment)*.

A. T. PENNY, *Senior Flight Cadet (Navigator)*.

M. B. D. PURT, *Senior Flight Cadet (Pilot)*.

C. ROBERTS, *Senior Flight Cadet (Pilot) ; Rugby (Colours)*.

K. W. N. SALISBURY, *Senior Flight Cadet (Secretarial) ; The Ministry of Defence (Royal Air Force) Prize for Secretarial Flight Cadets*.

J. SEFTON, *Senior Flight Cadet (Pilot)*.

R. J. SHARP, *Senior Flight Cadet (Pilot)*.

G. E. STIRRUP, *Senior Flight Cadet (Pilot)*.

J. A. STOCKILL, *Senior Flight Cadet (Secretarial)*.

R. A. A. SUDLOW, *Senior Flight Cadet (Pilot) ; The Ecole de L'Air Trophy for French Studies*.

L. P. TREWINNARD, *Senior Flight Cadet (Pilot)*.

I. D. VACHA, *Senior Flight Cadet (Navigator) ; Rugby (Colours)*.

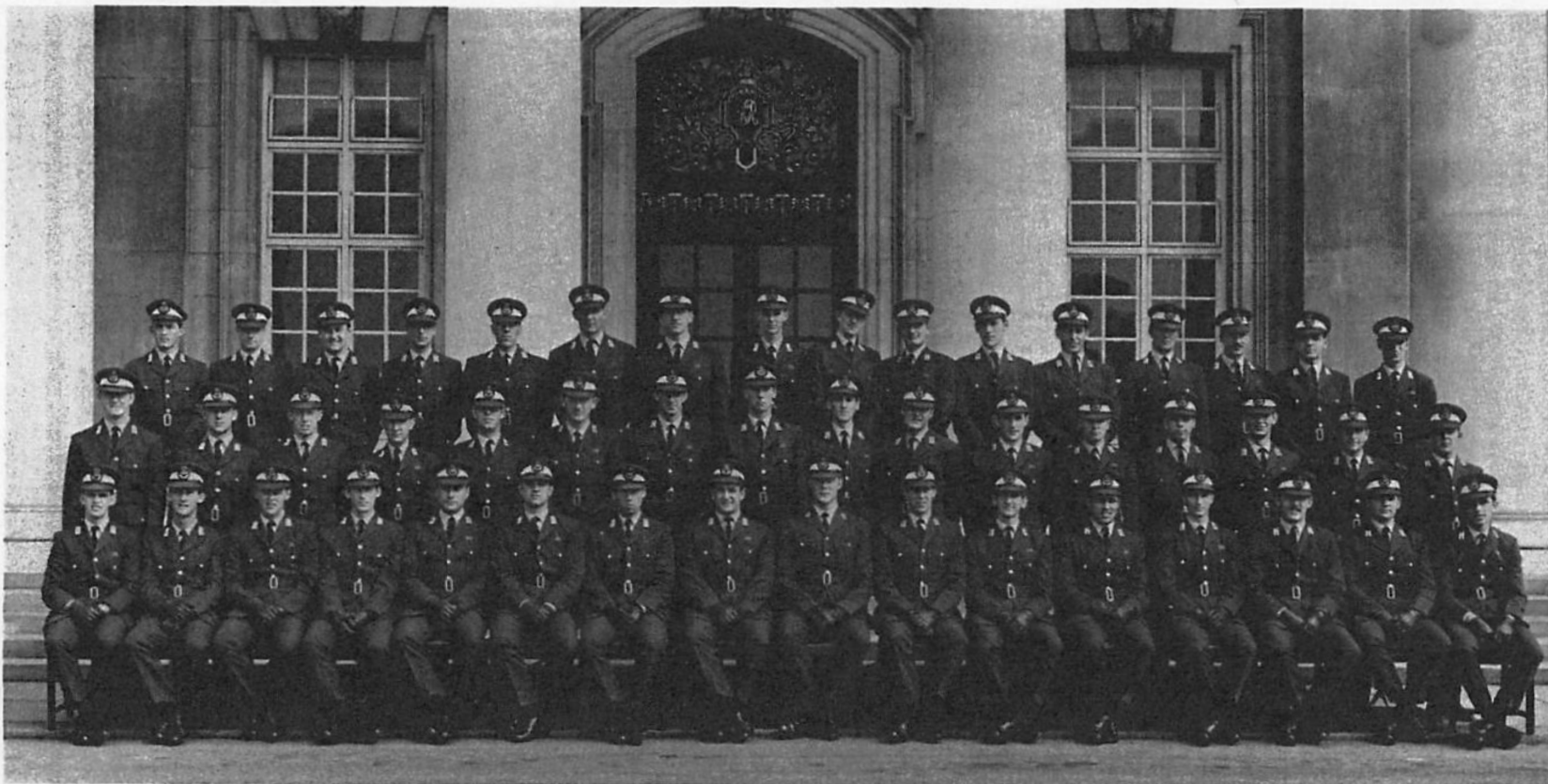
L. M. WARRINGTON, *Senior Flight Cadet (Pilot)*.

R. P. WATKINS, *Senior Flight Cadet (Pilot)*.

I. A. B. WILSON, *Senior Flight Cadet (Pilot)*.

E. J. WYER, *Senior Flight Cadet (Pilot) ; Basketball (Colours)*.

December 1970 - Passing Out 98 Entry (Jul 70)



NO 98 ENTRY

Back Row : *Senior Flight Cadets : A. M. L. Barcroft, R. D. Gregory, R. Handfield, J. A. Stockill, K. McGuire, I. D. Vacha, C. Roberts, I. A. B. Wilson, R. A. A. Sudlow, L. M. Warrington, S. T. Morrell, R. D. Parry, N. Barton, R. P. Watkins, R. Furlong, A. T. Penny.*

Centre Row : *Senior Flight Cadets : K. M. Graham, J. Sefton, G. P. Evans, A. Davies, C. P. Hicks, S. J. Orwell, E. J. Wyer, A. K. Clarke, R. L. Goodison, G. E. Stirrup, M. B. D. Purt, S. G. Mould, J. Middleton, E. Hunkin, A. S. Miller, J. A. D. Houlton.*

Front Row : *Senior Flight Cadets : L. P. Trewinnard, D. J. Mather, J. J. Barnett, K. W. N. Salisbury. Under Officers : C. J. Kennedy, A. G. O. Dee, J. T. Wood. Senior Under Officers : C. D. O'Connell, D. J. Edington. Under Officers : W. A. J. Mates, A. J. Gatland, B. M. Longhurst. Senior Flight Cadets : S. B. McBain, R. J. Sharp, P. I. Parsons, J. Harrington.*

December 1970 - Lead Article

THE BAND OF THE ROYAL AIR FORCE COLLEGE

1920 — 1970

Many will know already that, next to the Central Band, the Band of the Royal Air Force College is the most senior in years of our Service bands.

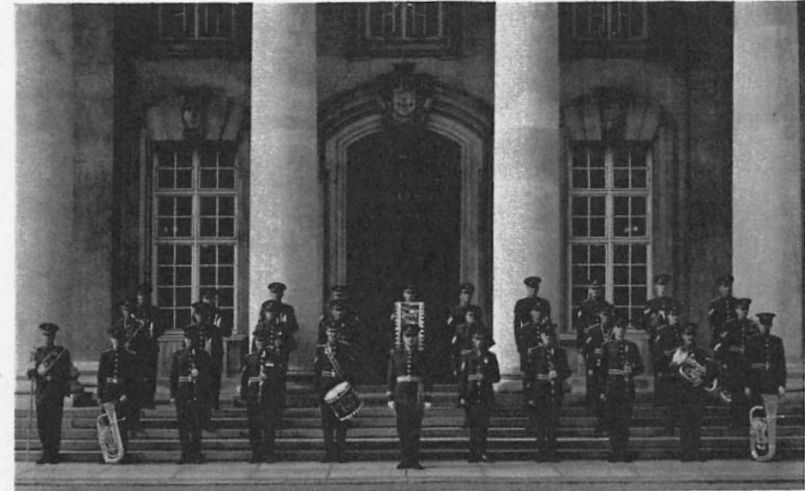
According to information which appears in our oldest files, it was shortly after the formation of the Central Band in April 1920 that a group of musicians were certified 'free from infection' and fit to travel to the Cadet College to assist in the formation of the College Band.

Warrant Officer A. E. Halford of the 1st Battalion King's Regiment became the first bandmaster, and, much to the concern of his Colonel, it appears he sought to coax several regimental musicians to come with him. Apart from this the band has remained mainly thoroughbred.

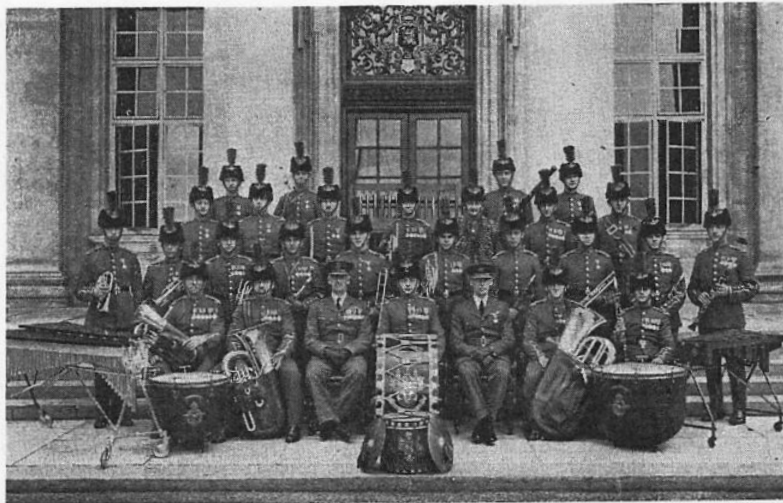
The first loyalty of the band has always been to the College itself, and since the College was established the band has been present on all occasions where music has been necessary: each parade, Sunday Church Service and Guest Night, and numerous other less formal occasions when they have simply entertained by concert-giving.

The Band was also popular outside the College. After its first public appearance in 1921, it made a first broadcast from Cardiff in 1923. This was followed by further broadcasts from the North and West Region Stations, and it was not long before the band was known to a wide audience.

Old programmes and account books show that the band appeared at numerous county shows and seaside resorts. One of our more



*The Band of the Royal Air Force College 1970
(Director of Music, Flight Lieutenant D. S. Stephens)*



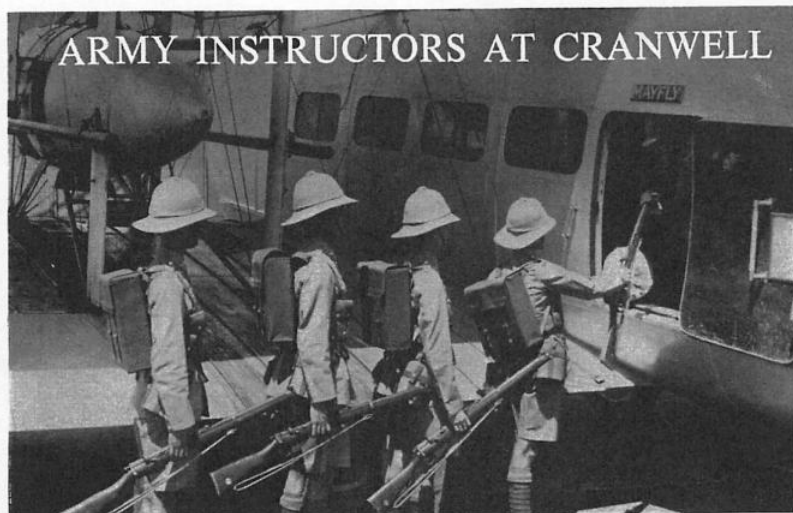
The Band of the Royal Air Force College 1937

interesting printed programmes was produced by the City of Plymouth where the band presented daily concerts on the Hoe in the week before the last war commenced in 1939. The band was present at the Jubilee Celebrations of King George V, and was selected to attend with the Royal Guard of Honour at Buckingham Palace at the Coronation of King George VI and Queen Elizabeth. At the Coronation of Queen Elizabeth II in 1953 the College Band appeared in the procession.

One of the now retired members of the band Sergeant E. 'General' Grant, who resides in Cranwell Village joined the College Band as a boy musician at the age of 17. He finally retired after serving at the College for 38 years without a break. He can recall the times when Aircraftsman Ross (Lawrence of Arabia) would call in the band billets for a tête-a-tête.

At Guest Nights, choosing music to aid digestion is sometimes a problem. However, we have left behind us the time when no dinner programme was complete without 'Daisy,' 'My Bonnie,' and 'Lily of Laguna.' Our own music library includes an interesting and meticulously kept programme book for the period 1934-1939 in Wing Commander Sims' own hand. The Wing Commander was Director of Music at the College from 1932 to 1946 and on a programme dated 26th July 1937 he recorded the fact that two items were not played, firstly owing to there being 'too much of a rough house,' and secondly 'A game of leap-frog was in progress.' During a third item a Xylophone appears to have been smashed in what he describes as 'A Grand Rag'! Clearly the musicians have not always enjoyed the Palm Court placidity which has accompanied Guest Nights of more recent years.

December 1970 - Second Article



During the 50 years of Cranwell, serving and retired members of the Army have played a small part in the staffing of the College. In the early days, many of the education officers were retired Army officers. The *College Journal* suggests that much of their time was spent hunting and shooting. Some Old Cranwellians of 1928 may be able to remember Major F. C. W. Taylor and Captain A. S. Thomas to bear this out. No doubt a popular Army member of the staff was the Army dentist. It would appear that the Royal Air Force Dental Services needed support from the Royal Army Dental Corps. This support came in the form of Captains Bennett and Whiter who were later replaced by Major Sumnerling. He pulled teeth from 1929 to 1930.

Without doubt Major R. W. Allen was quite invaluable to the organisation of the College. Many journals mention how well-controlled the Cranwell Hunt Club Stables were, remarking how he exercised the horses before breakfast and fed them after work in the evening. The conscientious Major undoubtedly found time to hunt at least two or three times a week to keep his hunters in trim. There were various ex-Army education

instructors up to the time of the war, but they would not have been seen as such to cadets. Education instructors in those days were in civilian clothes. Lieutenant Colonel R. A. N. Lowther, MC, seems to have become very much part of the Cranwell scene. He was assistant adjutant from 1938 until the war, returning to the Army during that period. After the war, he returned to Cranwell as the Adjutant of Flying Wing from 1946 until 1949.

From 1948, Cranwell instituted the Army Instructor as we see him today, a member of the war studies instructional staff. Fourteen Army officers have served at Cranwell for a period of up to two years. Only two of that number have not been infantrymen, these two were gunners. Though none of the Army Instructors have reached the highest ranks of the Army, on average most have made Lieutenant-Colonel and one is now serving as a Brigadier. For the interest of Old Cranwellians and members of the staff since 1948, I have listed the details of each officer as they are now known. In many cases their Regiments are lost to the British Army, but I have updated them to show their present titles :—

<i>Rank</i>	<i>Initials</i>	<i>Name</i>	<i>Present Day Regiment</i>	<i>Dates</i>	<i>Present Address</i>
Colonel	T. G.	Steele	The Royal Regiment of Fusiliers	1947-1948	Now MOD (Army) representative for the NAAFI. Lives at 25 Dodds Crescent, West Byfleet, Surrey
Colonel	M. A. C.	Osborn, DSO, OBE, MC	The Prince of Wales's Own Regiment of Yorkshire	1948-1950	Retired 1964 to Skiathos, Greece
Colonel	I. H.	Battye, MBE, BA	The Queen's Regiment	1950-1952	Retired 1968 to Ferry House, Quayside, Woodbridge, Suffolk
Lieutenant Colonel	G. J. S.	Cotton	The Royal Anglian Regiment	1952-1954	Now a Retired Officer Grade III at HQ BAOR (Q Qtr) BFPO 40
Major	J. W.	Peyton, MC	The Royal Highland Fusiliers	1954-1956	Retired in 1958 to 2816 Seaview Road, Victoria, British Columbia
Brigadier	D. W.	Coyle, MBE, DFC	Royal Artillery	1956-1957	Now Brigadier HQ Director of Army Aviation, Middle Wallop, Nr. Stockbridge, Hants.
Lieutenant Colonel	A. J.	Noble, MC	Queen's Own Highlanders	1957-1958	Retired 1958 to Flatfield House, Symington, Ayrshire
Lieutenant Colonel	B. D. H.	Clark, MC, GM	The Irish Rangers	1958-1960	Retired to Knocknagow, Kilmacanogue, Co Wicklow, Eire as Sec RNLI in Eire
Colonel	W. H.	Atkins, OBE	Royal Artillery	1960-1962	Now Colonel Executive Branch Intelligence Division SHAPE
Lieutenant Colonel	A. F. F. H.	Robertson	Royal Anglian Regiment	1962-1964	Now Commanding 23 SAS Regiment, TAVR Centre, Kingstanding Road, Kingstanding, Staffs
Lieutenant Colonel	D. C.	Thorne	Royal Anglian Regiment	1964-1966	Now at the RAF Staff College, Bracknell, Berks
Major	J.	Tadman	Royal Anglian Regiment	1966-1968	Now with 2nd Battalion The Royal Anglian Regiment, Hyderabad Barracks, Colchester, Essex
Lieutenant Colonel	J. J. L.	Thorpe, MBE	The Parachute Regiment	1968-1969	Now GSO 1 at the JWE, Old Sarum, Wilts
Major	I. G.	Nason	Queen's Own Highlanders	1969-	Present incumbent.

December 1970 - Third Article

THEY ALSO SERVE.

As generations of old Cranwellians will readily testify, the Royal Air Force College owes a great deal to the members of the civilian staff who have served its aims and traditions with loyalty and devotion to duty during its fifty years of existence. Here then is a brief portfolio of six of the longest serving members of the civilian staff who are still serving at the College.



Left to right : C. V. Collishaw, F. C. Richardson, G. W. Bennett, A. M. Pirie, G. Allen-Lyne, B. Hickson.

Mr C. V. COLLISHAW (BATMAN)

Mr Collishaw, eldest of four brothers employed at Cranwell, started work as a Servant on 16 January 1926, and is therefore the longest-serving civilian here today. He enlisted in the Royal Air Force (VR) on 22 November 1940 and was discharged on 14 November 1945, when he resumed his former employment. Mr Collishaw's father was employed at Cranwell during the period 1919-1933, so the family has half a century of continuous service with the College.

Mr F. C. RICHARDSON (HEAD BATMAN SERVANT)

Mr Richardson was employed privately by the College as an errand boy from 4 January 1927 to 18 September 1931. On 19 September 1931 he commenced employment with the Royal Air Force as a batman. He was called up and served in the Royal Air Force from 10 December 1940 until 21 November 1945, when he was reinstated as a batman. He was regraded to Servant on 5 May 1948 and promoted Head Servant on 6 February 1964. He has therefore served continuously in the College, with the exception of the war years, since 4 January 1927.

Mr GEORGE WILLIAM BENNETT

Mr Bennett commenced work at Royal Air Force Cranwell, in the grade of Cook, on 12 December 1929. Except for a break between 22 November 1940 and 9 January 1946, when he joined up for war service, he has had continuous service with the College.

He was awarded the Air Officer Commanding-In-Chief's commendation on 2 January 1961, and the BEM in 1968. He is at present employed in College Hall in the capacity of Head Cook.

Mr ANDREW McARTHUR PIRIE

Mr Pirie joined Royal Air Force Cranwell on 20 May 1935 as a Waiter; shortly afterwards he was regraded to Driver MT.

From 16 July 1937 until the outbreak of war Mr Pirie was employed as a Ministry Warden (Constable).

After the war he was reinstated in the grade of Driver MT and on 5 November 1956 was promoted Charge Hand. He remains in that capacity at the present time.

Mr BERNARD HICKSON

Mr Hickson commenced work at Cranwell in July 1935 as a Labourer. In October 1936 he was regraded Waiter and employed in the Sergeants' Mess until the outbreak of war, when he was recalled for service with the Royal Air Force and attained the rank of Sergeant. After the war Mr Hickson spent two years at Royal Air Force Fulbeck as a Batman, returning to Cranwell in 1948 as a Waiter. In 1952 he was regraded Batman and employed in College Hall. In 1969 Mr Hickson was awarded the Imperial Service Medal.

Mr GILBERT ALLEN-LYNE

Mr Allen-Lyne commenced work at Cranwell on 3 July 1931 and was employed as Steward, Waiter and Batman until November 1940 when he joined the Royal Air Force and served until 7 November 1945.

On 8 November 1945 he was reinstated as Batman, and remained as such until he was regraded to Hall Porter and transferred to No 2 Officers' Mess on 5 April 1967. In December 1967 he was awarded the Imperial Service Medal.

Two other well-known College stalwarts, Mr 'Eddie' Cant, hall porter and 'Pep' Pepper, the head batman, were invited to take part in the BBC broadcast 'Cranwell' which was transmitted on 22nd February, 1970, to commemorate the Fiftieth Anniversary of the Royal Air Force College. The BBC has kindly allowed us to reproduce some of their reminiscences from this broadcast.



Mr 'Eddie' Cant

Mr 'EDDIE' CANT

One of the commandants here was Air Vice Marshal Atcherley, and he knew everyone, it didn't matter who came into his room he always knew what their name was and I could never understand how he did this. Another was Air Commodore Nelson, he was Commandant and he always used to tell a story against himself about how he was the only cadet that got restrictions on the Passing Out parade. The Reviewing Officer came down the line and he stood in front of him and said 'Your hat's not on straight. Who do you think you are, Napoleon?' And he said 'No, Sir, my name is Nelson.'

Oh, the cadets in those days used to be up to all sorts of tricks. One morning I was at work just outside the College and there was a procession coming along. When it got near me I saw it was a mock funeral. It appeared that they'd had three days of plum duff for lunch so they decided to bury it.

Mr 'PEP' PEPPER

I started here at Cranwell in January 1929 when we used to live in single officers' quarters, and the pay in those days was 38/3d a week and we used to work 70 and 80 hours with no overtime, but we used to get time off in lieu to play the cadets at different games. They used to ring up on Wednesday and say right, bring a team over, Pep, we'll play football or hockey, or whatever game it was, and then we used to go down at night to watch the cadets box. We used to go over to the graduation balls and when they'd had one or two drinks, they used to get up to all sorts of capers, and it was a real hectic night. And I remember one time when the old mess was a wooden hut, there used to be two cannons in front and they used to pull them into the mess.

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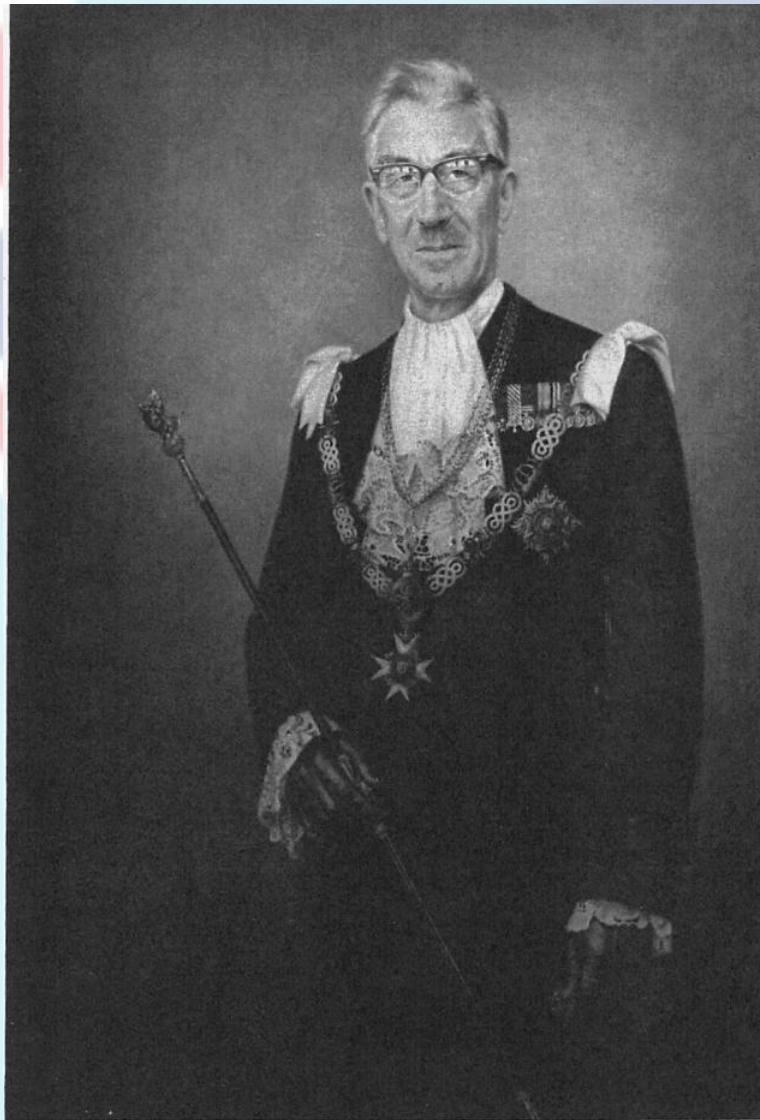
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Mr 'Pep' Pepper

December 1970 - Fourth Article (1)



**AIR CHIEF MARSHAL SIR GEORGE MILLS, GCB, DFC,
Gentleman Usher of the Black Rod.**
(after the portrait now hanging in College Hall).

December 1970 - Fourth Article (2)

CRANWELL CADET - 1920

by AIR CHIEF MARSHAL SIR GEORGE MILLS, GCB, DFC

When the Royal Air Force (Cadet) College opened on 5 February 1920, there were fifty of us Cadets. Seventeen were from the Navy, two Sub-Lieutenants and fifteen Midshipmen. They wore uniform with the two war ribbons. The rest, the Schools Entry, wore suits and bowler hats and that is how we paraded till our uniforms were ready. One character did appear once in breeches, stockings, trilby hat and gauntlet gloves but not for long.

The Naval entry had been offered the chance of a permanent commission after a year at Cranwell. This was at a time when big cuts in naval strength were inevitable. The rest of us were to do two years. We had taken the same examination as candidates for the Army who trained at Woolwich and Sandhurst. There was a qualifying standard but beyond that it was competitive. In those days the first forty or fifty would go to Woolwich with the rest up to the required number to Sandhurst. At first our standard was low in comparison, for instance I was first for Cranwell but only forty-fourth for Woolwich. This changed very quickly.

On the other hand our medical standard was much higher and kept out several who would otherwise have qualified easily. This upset the plan of one of my friends who purposely failed the written examination so he could stay on to captain his school rugby team till Easter. He was called in to take a vacant place. Another friend benefitted too. He was late for the examination but was allowed a place on nomination by his Headmaster, only to be turned down three times with a defective eye. He did not give up, he got a list of pilots who had done well in the war with only one good eye and sent it direct to the Secretary of State with an appeal. He got in and was a first-class, natural, born pilot. The Secretary of State was Winston Churchill.

Why did we choose Cranwell? There is no single answer but there are two overriding factors. First, flying was new and had come right into the public eye during the war. Secondly, when the war ended in 1918 all

chance of learning to fly virtually ended until Cranwell opened. So some came simply to fly, others who would have chosen a Service career anyway, were able to branch into something new and others, notably the Naval term, were able to combine both with a better chance of staying in a Service. In common with Woolwich and Sandhurst we cost our parents or guardians about £125 a year. There was some reduction for sons of deceased and serving members of the forces below the rank of Group Captain. A King's Cadet, from the Boy Apprentice Schools, was free. A Prize Cadet, the first three in the entrance examination, cost only £20 or so. On the other side of the ledger, we were paid 5/- a day in our first and 10/- a day in our second year, plus 1/- a day ration money.

February 5th was a Thursday and the rest of the week was taken up with settling in, being detailed to two Squadrons and being measured for uniforms. About now too, Cadet NCO's were appointed. For the Naval Entry this was simple, they had their seniority, for us it seemed necessary to have a moustache to qualify. However it worked, and those of us with young, boyish faces were left with two carefree years as simple flight cadets.

When we began our regular work it was very disappointing to find that we would not begin pilot training till the next year. However, two periods a week were allowed for flying so it was not too bad seeing that most of us had not even sat in an aeroplane. We never averaged two flights a week, it was more like one, but the prospect kept us going.

Within a fortnight we had our first flights. It is hard to recapture the excitement, and the anxiety lest we should not like it after having set our hearts on it for so long. In fact two left very soon because they were airsick. Our flying kit was simple; helmet and goggles, a pair of thin leather gauntlets, with a sort of bag on the back which could come over the fingers, a pair of silk linings, two pairs of overalls and a huge pair of rubber overshoes we never wore except in the snow. It was a

pale blue, slightly hazy day with no cloud when I first flew. I had asked the pilot to loop and he did, but I did not see much of it because I was looking inside the cockpit and centrifugal force kept my head down. I was rather disappointed, but he did several other things and I thoroughly enjoyed it. From now on we tended to live for the next flying day and to worry lest the weather should stop us which it so often did. We enjoyed life alright, it was so much freer than school but the thought of flying again before long added greatly to our enjoyment.

We were at the West end of the camp, with our Mess opposite the present entrance to the Orange about 100 yards from the road. Our huts were to the east of it and were of black, tin-hutted construction. Next came Station HQ and the Officers' Mess as now, then the airmen's quarters and finally the East Camp where the Boys' Wing was. Practically all flying was from the south aerodrome, huge then as now. The north aerodrome was unobstructed except for a few sports grounds tucked in on its southern edge. To the north was Lighter than Air with its big airship shed unused except for storage; it stood where the officers' married quarters now stand. The Lodge was occupied, there were five other officers' married quarters to the west of our mess, and a few for airmen towards East Camp. A small railway ran from the camp to Sleaford station. We used it once or twice early on, then it seemed to revert to freight.

We lived five to a hut. One half was bedroom, with plenty of room for our five beds and chests of drawers, the other half sitting room with five tables and chairs, some easy chairs and a coal stove. There seemed to be plenty of washing and lavatory facilities. Each hut had a civilian batman who kept it clean, made the beds, did our boots and called us. We did our buttons. Some of the batmen stayed for years and were great characters. One night early on when we were in bed we heard a lot of shouting from the main camp and this went on for some time. We learnt later that some airmen had chased the Sergeant Major into the Guard Room because he was so strict. We never heard how it all ended. We had to stand to our beds for kit inspections and medical inspections. The latter came about once a term when we stood in shirts only, ready to

bare our innocence as the MO came by. Kit inspections came more frequently, always after lunch and for only two huts at a time. There was therefore enough time to borrow if necessary.

Raised and covered wooden footways connected the huts to the Mess. They did not keep out the wind or driving rain! The mess was comfortable and furnished in officers' mess style. The food was good and we had plenty. Drinks were only served at meals and beer was the only alcohol allowed except for a glass of port on Fridays for the loyal toast. This cost a shilling. We wore mess kit at least five nights a week and had a roll-call before dinner. Later when there were more of us it was easier to answer for someone who was a bit late. Our mess accounts were made up daily in a big ledger in which our pay was credited. Periodically we drew any balance due to us, or our parents had to make up any deficit. I usually had a small credit even on 5/- a day.

The parade ground which lay just behind the mess was the domain of the two Flight Sergeants, Allan of 'A' Squadron and Burdett of 'B'; and later of the famous Sergeant Major Gorwood, who did the rest of his service at Cranwell. Between them they made drill very bearable and made us quite good. They had to too because we soon became the centre of a hollow, three-sided square on the daily, colour-hoisting parade, with the Boy's Wing on one side and the rest of the station on the other. Even then we marched off to the RAF March and the 'Lincolnshire Poacher' and the sound of either, now, still takes me straight back to that parade ground. Once, on colour-hoisting, we saw an NCO discharged with ignominy. He was marched in front of us, his sentence and crime read out and his buttons and stripes ripped off. Another time a workman was working on the mast as the colour went up to the yardarm and took off his cap with a fine flourish as we presented arms. Colour-hoisting was every day except Sunday when we had Church Parade, with a keen inspection by the Assistant Commandant. It was during inspections before these daily parades that summonses to the Squadron Commander's orderly room were issued. Few can forget the refrain as the Flight Sergeant passed behind us, 'Office for you Mr so-and-so,' and 'Eyes

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Flight Cadet G. Mills.

front !' as ' Mr so-and-so ' looked round in horror.

Our other ground subjects of course took much more time than drill but it is hard now to remember much about them except where we went and a few odd details. Engineering was simply fitting and rigging, which we did in a hangar across the road from the mess. Apart from the Gnome, Falcon and Liberty engines, fitting included metal work and making those dreadful steel cubes which got smaller and smaller as we tried to get them right. Rigging was largely a matter of getting the aeroplane symmetrical, quite an art with a structure of wooden members and bracing

wires. There was woodwork too for repairing damaged parts, and control cable splicing. We made many of the toilet-paper boxes on the camp, all with laboriously dove-tailed joints. Later, to encourage our mechanical sense, P & M motor bikes were issued to some of us. Petrol was supplied but we did the maintenance. They could be used outside the camp in certain circumstances which was useful as we were not allowed our own bikes or cars even if we could afford them. Our maintenance was rather shown up in a reliability run held towards the end of our time. Less than half completed the course in time, with many straggling home in the dark without lights. One cadet broke his leg.

Armament was taught in a building near the road to the airship shed. 20lb, 112lb and 250lb bombs were current issue and had a confusing range of fuses, detonators and exploders. For guns we had the moveable Lewis and fixed Vickers. The CC gear allowing the latter to fire through the propellor was a difficult mystery to handle.

Academic subjects like English, Science and Mathematics had a brick building near to Station HQ. We did written exams here too. The instructors were civilians and many became familiar figures to many terms, unlike the Service instructors who stayed for relatively short periods. In mathematics we got to elementary calculus, in English we could choose our own subjects for essays. This was very advanced. I remember little else except that our Squadron Commander once came to an evening class in full uniform with breeches and field boots and a civilian cap. Those were the days of field boots for Squadron Leaders and above and puttees for those below, even for flying.

In a hut near the parade ground a Flight Lieutenant with an Observer's Wing taught us Law and Air Photography. Another did wireless, where we wrestled with morse keys and headphones. There was no voice radio and the W/T operator was very much of a specialist. We wrestled with service organisation under our own officers. All I can remember is that boys in the Navy could be caned in those days.



Tail Skid Problems.

Airmanship and Navigation lectures came in our flying periods when weather prevented flying, which seemed much too often. They were bad days. We would march to the hangar still clinging to hope and our Cadet NCO would go in to report. Then out he would come giving the ' wash-out ' signal and march us off to a nearby hut. It was hard to concentrate when you felt so disappointed. The Church, gym and swimming bath were all in hangars on the south aerodrome just east of the present ones. All three padres were great characters.

Games and exercise of all kinds were vigorously encouraged and we were expected to do something active every free afternoon. During our first year, in September, I was lucky enough to break a finger at hockey. Not only did this keep me off rifle drill and other tiresome things but left me free to hang around the hangars if anyone was flying. I got four extra passenger trips this way. But for my finger I could have been in trouble for skulking round the tarmac instead of taking exercise.

At first with so few of us, competition to get into the teams was not severe, but the arrival of new terms in September and the new year quickly altered this and standards rose fast. By the next summer we began regular fixtures with Woolwich and Sandhurst.

Riding was very much encouraged, because it developed the sensitive hands so essential in the air, where the feel of the controls meant so much. Anyone could readily get time off for hunting, but very few indeed could afford even to ride. The cadet who won the first R. M. Groves Memorial Prize for flying was one who did. I think he had ridden all his life. Beagling was encouraged but did not have the same virtue as hunting. We could get transport but not time off for it.

We had about four weeks leave at Christmas and in the Summer and about ten days at Easter. We would travel to and from Grantham in 5 ton Leyland lorries, twenty or more of

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us, all standing. A dozen or less might have a 30 cwt Crossley tender which had a bench down each side. Our leaves were entirely free of any special activities, the only snag was having no chance to fly.

We flew from the south aerodrome, the hangars being where they are now. There were no runways, parachutes or flying control. The procedure was simple. You took off and landed in your own time into wind and where it was most convenient. The pilot was responsible that all was clear ahead and that he would not obstruct anyone else already landing or taking off. A machine landing always had right of way. We always spoke of 'machines' then. All our flying was on the Mono Avro, the 504K with a 100HP Gnome Monosoupape rotary engine. With luck one could get a short flight in another type if an instructor could borrow it from a visiting pilot. I had two that way.

The Mono Avro was used in great numbers as a trainer during the war. It was very well-suited, big enough to avoid torque trouble, reasonably light on the controls and robust enough to stand a good bit of bumping about. It was good for aerobatics, 'stunting,' for beginners. Loops, half rolls, stalling turns and an occasional falling leaf and spin were our normal repertoire. She did about 70 mph level, came in at around 60 and had to be dived to 90 for a loop.

She had no inherent vices but was not easy to taxi in a wind. This prevented flying on many occasions, as did low cloud and poor visibility, since we had no radio or blind flying instruments. For intercom there were two Gosport tubes, one from instructor to pupil and vice versa. These were flexible metal voice pipes with a mouthpiece at one end. The other end connected with two earpieces in our helmets via a metal Y piece and thinner lengths of rubber tubing. They were quite effective.

The engine was a slight problem as it only ran at one speed, the throttle lever simply allowing a fine adjustment of the petrol flow to let it do so. In the air when you closed the



Q.F.I's.

throttle in the normal way your forward speed kept the propeller, and engine, windmilling. To start again the lever must be pushed forward to the correct setting. If the engine stopped through gliding too slowly you could start it by diving if you had enough height. For waiting on the ground and taxiing there was a blip switch in the top of the control column; this allowed the engine to be run in short bursts without upsetting the throttle setting which was critical. The engine used castor oil and used it lavishly. The smell of it and the noise of the blipping engines are quite unforgettable. They were heaven. All the same this inability to throttle back made it easy to lose your propeller on landing. This was not so bad if flying with an instructor, you just got out and swung it. You were not so popular if you were alone and someone had to come out to do it.

On the first detail for the day the machines were lined up for inspection and when the word was given our instructor led us round, with the rigger and fitter in attendance. He would check the wheels, flip a wire and tweek a control cable here and there and maybe test the tailplane for firmness; there seemed to be no set procedure and certainly no maintenance sheets to sign. When all were done we carried on flying.

Our first year we sketched villages and places and map read, while we followed the progress of the Naval term with interest and envy. They were all flying solo by the summer. That autumn the weather was very bad and

the naval term had to have preference, so we got very little flying, which was miserable. Nevertheless by Christmas we had done ten hours or so each and had got used to being in the air. Our only real excitement was when a naval cadet, Yale, had the only crash in our two years. He stalled making a forced landing, badly damaging the undercarriage and front of his Avro. He was unhurt. We saw the wreck coming in on a trailer, it was a great thrill!

When we began dual instruction in February 1921 we flew much more often, sometimes maybe three or four times in a week. It was fun but at times I thought I would never learn to land. The first of us went solo at the end of March and the rest of us over the next month or so. We had had between ten and fifteen hours instruction. I got very impatient and rather frightened as I began to feel ready to go but felt quite calm when I was sent off alone. I lost my prop just before touching down but that was forgivable on a first solo and I was not too far from the tarmac.

After this, apart from frequent short checks by our instructors, we always flew alone. We would be told what to practice and for how long; anyone who landed late when someone else was waiting was very unpopular. Very soon we added aerobatics on our own, often egged on by hearing that someone else had tried. Some were shown how by their instructors but I never was. This was in line with the Gosport doctrine that a pupil should be encouraged to find out for himself once he could fly reasonably safely. It could make you breathe a bit, making up your mind to do things, particularly for the first time! Like going up through an unbroken cloud layer; we had no blind flying aids. But the wonder of breaking out into bright blue sunshine with the dazzling white of the clouds piled up around was worth a bit of anxiety. Once I got in a panic just because I was in the air. I knew there was an eclipse but when the light went an eerie, greeny-brown, I felt I must get down. But I couldn't because my time was not up, so I went down and flew at 'nought feet' across the north aerodrome. There I saw our shadow picked out like a drawing, struts and all. Then I felt better and went back up and carried on. We never really spoke about being frightened even amongst ourselves, but no doubt most of us were from time to time. In fact it was this mixture of fright and enjoy-

ment that made flying such fun and so fascinating.

We did two cross-country flights, one to Lincoln and back and the other a triangle of 45 miles; the sight of the big airship shed was as always a great comfort. We never landed away from Cranwell except for engine failure. These were still quite frequent and had a marked effect on flying technique. In lectures we were taught always to keep a possible landing place in view and how to tell the wind at ground level. Do cows still lie down into wind? In the air every landing had to be treated as a forced landing; once you had shut off your engine that was that, it was the height of bad airmanship to use it again to drag yourself in to the desired spot. We were taught how to sideslip off height, undershooting was bad. 'No I deadly sin' was of course to turn back on take off.

Thanks to this teaching but even more so to the size of the aerodromes at Cranwell and of the fields around, Yale was the only one to come to grief in a forced landing. I do not know how many we had, but I see I had six in 1921 in thirty-four hours flying, three alone and three with my instructor. The causes are interesting. In two, one to each of us, we ran out of petrol and flew back after someone had flown out with a can or two. We had only been flying some twenty minutes at the time; normal endurance was 1½ hours or so! Once we had a broken connecting rod. When I did my first loop and 'hung' on top, the distributor wire fell out of the magneto because the split terminal was loose. I got down in a field. Another time gliding from 11,000 ft the oil congealed and I could not get the engine to turn. This was over the aerodrome. The other time involved a three-mile walk home for help, while my instructor waited with the machine. My log book gives no cause. No special notice was taken of these incidents and both times I flew out of the fields I had landed in.

We were not allowed to fly together or take passengers but shortly before we left two particular friends in our term flew with me. I had extra flying in the afternoon and picked them up and landed them again on the North aerodrome, and we got away with it. Probably others did the same but one did not talk about it.

By mid-December flying finished and exams began. We averaged about forty-five hours in

the air of which eighteen to twenty were solo and around fifteen dual. About this time too we heard that a third of those passing out would stay in UK, the rest would be posted to Egypt, including Palestine and the Sudan, India and Mesopotamia (Iraq). We were allowed to state a preference and though the overseas tour was five years I believe enough of us volunteered. We could also say what type we wanted to fly, DH9a, Bristol Fighter or, I think, Sopwith Snipe.

There must have been special parades when the Naval term passed out and when we did a year later but I cannot remember them. I can remember speeches in the gym after lunch, with prize-giving when we left. There were only three prizes then, the Sword of Honour, the Groves Memorial prize for flying and the Abdy Gerrard Fellows for Science and Mathematics. We had passing-out Balls each year too, though I cannot recall that we were at any time told if we had passed out. That came later in letters from the Air Ministry after we had left. In the same envelope we had our posting instructions when most of us seemed to get what we had asked for. Sixteen of the original seventeen on the Naval course were commissioned and twenty-seven of the thirty-three on ours.

Those who stayed at home went to a conversion squadron but the rest of us did no more flying till we got to our overseas Commands in April. We travelled of course by troopship. In Egypt there was a full-scale flying school where they could convert, in India and Mesopotamia our squadrons had to do it. This was quite a problem for them, with us so inexperienced and facilities pretty sketchy with the one dual aircraft often unserviceable. Moreover the squadrons were mostly quite occupied with other work, including small wars and air control operations. It was not all that easy to learn a new type in these circumstances and I know that at times I must have strained people's patience to the limit. No doubt others did too. These men had all seen war service and many did not have permanent commissions as we did, yet nothing seemed to diminish the great kindness and friendliness with which we were treated. There was none of the 'keep the new boy in his place' attitude which was quite common in the other two services. This is perhaps the warmest and deepest of the host of cheerful and happy memories I have of those early days.