





THE ROYAL AERONAUTICAL SOCIETY

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VOLUME 77 NUMBER 753 SEPTEMBER 1973



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Cover pict

Cover pictu Concorde 02, as depicted on cover with the latest British Airw livery on its starboard side, is first supersonic transport to vy North America. It is also the f Concorde to be fully rep esental of the production version. C corde and its future derivati may well represent the ultimate speed of flight for conventio commercial aircraft. Dr. J. Sedd remarks in his paper on "Resea and Development for Future Transports" which appears in t issue that although the process constantly increasing the speed commercial air transports could viewpoint, the economic factor v now becoming predominant and development costs of penetrat the thermal barrier above Mact could be prohibitively high.

Leadership

The Concorde supersonic airliner

British Aircraft Corporation is in the very vanguard of progress in civil and military aviation, guided weapons and in Europe's key Space projects. **Concorde** – with Aerospatiale France – will halve the world in size. **Europlane QTOL** – with MBB of Germany, Saab-Scania of Sweden and CASA of Spain – will bring the boon of quiet take-off and landing to the world's airports. **One-Eleven 475** brings mainline jet services to the small fields. **Jaguar** – with Dassault/Breguet – is the most cost-effective tactical support aircraft in service or production today. **MRCA** – with MBB and Aeritalia – is Europe's most important military aircraft. **Strikemaster** has been chosen by nine nations for ground attack and training. **Rapier** has revolutionised missile defence against treetop aircraft attacks. **Swingfire** has changed the balance of power in defence against armoured attacks. The new surface-to-air **Seawolf** and air-to-surface helicopter-borne **Sea Skua** systems continue this leadership in missile engineering. And BAC has leadership, too, in many **Space** and satellite projects.



Branches

Wednesday 3rd October

Bristol — An outline of space science. G. G. E. Lewis. Room 9, BAC Canteen, Golf Course Lane, Filton (Supper Club). 6.00 pm (tea at 5.30 pm).

Swindon ---The Schneider Trophy Fuel/Engine Development. Air Cdre. F. R. Banks. The College, Swindon, 7.30 pm.

Monday 8th October

Bedford — The development of model aviation in the United Kingmodel aviation in the United King-dom. Lt. Cdr. A. Greenhalgh RN. Mander College, Bedford. 7.30 pm. **Cranwell** — Explosives. Dr. B. D. Shaw. Whittle Hall, RAF College, Cranwell. 8.00 pm. **Prestwick**—Ferry Flying. J. New-bery (General Manager, BAA Prest-wick). SAL Social Club. 7.30 pm.

Tuesday 9th October

Glasgow — The Multi-Role Combat Aircraft Project. Sqn. Ldr. Richard-son AFC (BAC). University of Glas-gow. 7.15 pm.

Wednesday 10th October

Chester — Aircraft wreck investiga-tion. D. Smith (Wartime Aircraft Wreck Investigation Group). Gros-venor Museum Lecture Theatre. 7.30 pm.

Thursday 11th October

London Airport-Joint RAeS/SLAET Lecture. Building and flying replica aeroplanes for films. Air Cdre. A. H. Wheeler. BOAC Senior Mess Club, TBA Building. 6.15 pm.

Wednesday 17th October

Bristol—Going into business. Peter Allard, Film Show. Sales Lecture Theatre, R-R(1971) Ltd, BED Patch-way, (Supper Club). 6.00 pm (tea at 5.30 pm).

Brough—A lecture on military air traffic operations by Sqn. Ldr. B. Fraser. Royal Station Hotel, Hull. 7.30 pm.

Coventry-Junior lectures or a lecture on flow visualisation by D. A. Hobson. Lanchester Polytechnic Lecture Theatre L.19. 7.00 pm. Halton—The work of the London Air Traffic Control Control

Traffic Control Centre. Charles Harvey (LATCC). RAeS Building, RAF Halton. 7.30 pm. Preston—Debate on "The RAeS has

no useful function to serve in the 1980s". The Plough, Freckleton. 7.30 pm.

Thursday 18th October

Southend-The operation of Army helicopters. Lecture by an Army Air Corps Pilot from Middle Wallop. Gloster Room, Airport Hotel. 8.00 pm.

Diary

In the Lecture Theatre, 4 Hamilton Place, unless otherwise stated. Visitors are welcome to attend all meetings.

Tuesday 9th October

Historical Group, Sir George Cayley. Charles H. Gibbs-Smith. 7.00 pm. Preceded by AGM at 6.30 pm.

Wednesday 10th October Rotorcraft Section. 14th Cierva Memorial Lecture. Helicopters, People and Places. Professor I. C. Cheeseman. (Southampton University). 6.00 pm. Tea at 5.30 pm.

Thursday 11th October 29th British Commonwealth Lecture. The Contribution of Civil Aviation to the Economic Strength and Well-Being of the UK and how best to increase that contribution. Lord Boyd-Carpenter. (CAA). 6.00 pm. Tea at 5.30 pm.

Tuesday 23rd October

Graduates' and Students' Section. Aerodynamics for Formula One. P. G. Wright. (Specialised Design Associates). 7.30 pm. Tea at 7.00 pm.

Monday 29th October Test Pilots' Group. Lecture details to be announced.

Tuesday 30th October (This lecture was originally scheduled for 24th October)

Joint RAeS/IEE Meeting at the Society. Discussion on "Airborne Fre-quency Allocation". To be opened by G. North. (NATS). 5.30 pm. Tea at 5.00 pm.

Lecture Summaries

29th British Commonwealth Lecture—Thursday 11 th October 1973 at 6.00 pm (tea at 5.30 pm).

The Contribution of Civil Aviation to the Economic Strength and well-being of the UK and how best to increase that Contribution

LORD BOYD-CARPENTER

Chairman, Civil Aviation Authority

In present conditions --- UK economy and balance of payments---need to take a new hard look at what economic activities can best contribute to it.

Increasing importance — service in-dustries—notably aviation. UK natural aptitude for it. High quality of flight-crew and best cabin service in the world. Helped by some of the "heri-tages of Empire".

Civil aviation's contribution NOT limited own direct contribution. If did not exist, many people here would travel by foreign airlines.

Contribution to tourism-one of the biggest earners of foreign exchange. If no civil aviation, very few tourists spare time to come from North America.

Also market and shop window for British aircraft manufacturers.

Urgent need to maximise

Dangers of excessive "environmentalism"

Encouragement to adopt modern equipment.

Importance of free choice of equip-

ment in a competitive situation. Regulatory problems and route licensina.

Structure of the industry. The growth end of the market. Fares. European problems. Anglo-American problems.

The Fourteenth Cierva Memorial Lecture —Wednesday 10th October 1973 at 6.00 pm (tea at 5.30 pm).

Helicopters—People and Places

PROFESSOR I. C. CHEESEMAN Southampton University

The helicopter has developed considerably since the pioneering days of Juan de la Cierva. In emergency roles the value of the helicopter is undisputed. However its impact on the transport scene has been extremely small. The reasons for this situation will be considered.

Future acceptance of the helicopter will depend upon the advantages which its use can give to the community at large compared with the environmental problems which it might raise. An attempt is made in the lecture to quantify some of these factors by considering the helicopter in relation to passenger travel for business and pleasure and its use for freight transport.

Aeronautical Journal September 1973 Diary/Notices

Dr. A. M. Ballantyne,

OBE, TD, BSc, PhD, CEng, Hon FCASI, FAIAA, FRAeS

A Scot in Hamilton Place

An Appreciation by Sir Peter Masefield

66 T TAKES a Scot to get the best out of an Englishman—and from a Welshman too, for that matter", wrote Robert Louis Stevenson with Caledonian discernment a year or so after the founding of The Aeronautical Society of Great Britain in 1866, when another Scot, George Douglas Campbell, the eighth Duke of Argyll (and Baron Hamilton) graced the first Presidential Chair.

There could be no more apposite words than those of RLS for Dr. Archibald Morton Ballantyne's genial and productive 22 years of Secretaryship of the Royal Aeronautical Society, at Hamilton Place and so many points beyond. Number 4 will not be the same without him. His retirement on 31st August 1973 marked the end of another memorable epoch in the history of the Society.

To quote the great RLS again:

"To be honest, to be kind—to make, upon the whole, a society and a family happier for his presence; to keep friends and to keep friends with himself—here is a task for all that a man has of fortitude and delicacy."

To keep friends—indeed to gain a vast circle of friends —and to go forward with "fortitude and delicacy" —these attributes match well the attainments of the Archie Ballantyne we have known and respected over the years; one who has made so distinguished a contribution to the progress and to the prestige of the Royal Aeronautical Society.

When he arrived to succeed Laurence Pritchard as Secretary of the Society on 2nd July 1951, the 43 yearold Archie Ballantyne, PhD, AFRAeS, brought with him from Glasgow and London Universities a quiet but determined North-of-the-Border approach to the difficult task of following the bluff and vastly experienced Pritchard régime. The Glasgow accent was as new to Hamilton Place as was Hamilton Place and its aeronautical fraternity to AMB. He had taken his BSc in civil engineering at Glasgow University in 1930 and gained his PhD six years later with a thesis on The Prevention of Erosion at the Foot of Weirs by Sills of various Sections. It was a theme which, he was quick to point out, had no connection with the Scottish aeronautical peer-Lord Weir of Eastwood-who had occupied the Society's Chair for seven formative years after the Great War of 1914-1918.



Dr. Ballantyne-1951

As a Territorial Officer Archie Ballantyne had spent the war years working on photographic research at Larkhill, on development of fire control instruments and tank sighting telescopic equipment and he was awarded the Territorial Decoration in 1951. By 1950 he was Senior Lecturer in the Civil and Municipal Engineering Department at University College, London. And so he came to the Society in its 85th year, as its tenth Secretary.

In all its 107 years the Society has had 47 Presidents. In such a passing scene the threads of continuity have been largely held by the ten Secretaries. Three of them together have spanned in office 78 years of the Society's history; the first Fred Brearey from 1866 to 1896; the ninth, Laurence Pritchard from 1925 to 1951. And now the tenth, Archie Ballantyne, from 1951 to 1973.

Like Prime Ministers, Presidents come and Presidents go. They leave behind them memories, events and progress from their varied policies, from their many backgrounds



Third Anglo-American Aeronautical Conference, Brighton 1951. L to R—Bob Dexter (Secretary, IAS), S. Paul Johnston (Director, IAS), Captain Pritchard and Dr. Ballantyne.

Dr. A. M. Ballantyne Aeronautical Journal September 1973



Mr. Peter Masefield (President) and Dr. Ballantyne receiving Sir Sydney and Lady Camm at the 94th Anniversary Luncheon in January 1960—the 50th Anniversary of the golden year of aviation—1910.

in the aeronautical profession and from their differing personalities. By contrast the Secretaries of Learned Societies are more akin to Constitutional Monarchs. Each grows in knowledge, in experience and in wisdom as successive, transitory, Prime Ministers—or Presidents pass before them.

Those pillars of the Learned Bodies advise here, prompt there, place a sage and restraining hand upon Presidential impetuosity at one point, urge forward at another. Only in the manner of their succession do Secretaries differ from their royal analogies. And in all its ten Secretarial reigns the Society has been fortunate. Perhaps part of the initiation of newly-joined students should be to learn them by rote—"1866 and All That".

- The list is short:
 - 1. 1866 F. W. Brearey,
 - 2. 1896 Major B. F. S. Baden-Powell,
 - 3. 1900 E. S. Bruce,
 - 4. 1907 Colonel J. D. Fullerton,
 - 5. 1911 T. O'B. Hubbard,
 - 6. 1912 B. G. Cooper,
 - 7. 1917 W. B. Faraday,
 - 8. 1920 Lieut.-Colonel W. Lockwood-Marsh,
 - 9. 1925 Captain J. Laurence Pritchard, and
 - 10. 1951 Dr. A. M. Ballantyne.

So, looking back over almost a quarter of a century, the more hoary-headed of the Society's members will recall (albeit now dimly) the sense of concern about the future when, in 1950, we learned that Laurence Pritchard's 25 years of stewardship were about to end. JLP had lived for the Society almost since the end of the First World War. He had seemed to be a permanent fixture, the embodiment of the RAeS. His was a calm and steady hand on the helm-even if sometimes he steered a controversial course. From his Secretarial cockpit he surveyed the world of aviation and of aeronautical personalities, from below two of the most beetling eyebrows in the business (rivalled only by those of Air Chief-Marshal Sir Frederick "Ginger" Bowhill of happy memory). It was the world of-among others of distinction -Sefton Brancker, and Bill Sempill, of Dick Fairey and of Brab; of Roy Fedden, of HP and of Roxbee Cox. Great days. Great men.

That was the background of the man to be succeeded in 1951. The post was advertised. There were more than 250 applicants.



Dr. Ballantyne with Dr. A. J. Barrett, Head of the Technical Department, at the opening of the Society's lecture theatre in December 1960.



Dr. Ballantyne and Mr. Henry Gardner (President) signing the petition for a Royal Charter for the Engineering Institutions Joint Council, August 1964.

So it was that the Selection Board set up by the Council to consider this conundrum, felt a surge of relief when Laurence Pritchard himself produced before it— (with something of the air of pride mixed with astonishment which goes with a conjuror lifting a specially choice rabbit out of a hat; or a Monarch displaying a new Prince of Wales to his people)—the elegant, and somewhat diffident, form of Archie Ballantyne, even at first glance obviously tartan through and through like good Pollockshields Rock.

That was in December 1950.

Dr. Ballantyne took over in the following July. He was soon very much at the Society's helm—"Archie" to the Society as a whole; dispelling doubts about the future. In all of this he was aided and backed by that fine band of dedicated staff inherited from Laurence Pritchard and led by Miss Florence Barwood (Mrs. Morrison) who had first joined the Society in 1918 and had been Personal Assistant to Laurence Pritchard since 1933. Miss Barwood continued in that capacity with Dr. Ballantyne until she retired in 1962 when she was succeeded by Miss Maureen Michael; happily with us today. In 1951, in addition to Miss Barwood there will be remembered with affection by older members, those other stalwarts; Miss Betty Voyce (Mrs. McLaren), Mrs. Joan Bradbrooke, Deryck Smith and Frank Smith. A great team. Their successors worthily carry on the torch. And still with us, Miss E. C. Pike, Editor of *The Aeronautical Quarterly*.

The new Secretary was quickly immersed in aeronautical affairs. There were Garden Parties to be enjoyed —in sunshine and in rain—at White Waltham and at Wisley. There were Anglo-American Conferences to be arranged, in Los Angeles and London, in Toronto, in Boston and in Montreal. And then, most distinctive and memorable of all, there was the Society's Centenary to be celebrated under the Honorary Presidency for the year of HRH Prince Philip, Duke of Edinburgh. And in that Centenary year, 1966, appropriately, Dr. Ballantyne was made an OBE.



Visit of the President and Dr. Ballantyne to Southern Rhodesia—Centenary year 1966. L to R—Dr. Ballantyne, Capt. Orbell (President, Rhodesia Div.), A. D. Baxter (President RAeS).

Looking back over these years of progress and endeavour, two things may be singled out from others as typical of Archie Ballantyne's contributions to the Society's well-being. They are: the growth in the volume and the repute of the Society's technical work, and the foundation of the RAeS Air Transport Courses, begun in 1956. There have now been 21 of these Courses. Numbered among their, nearly 1000, graduates are a goodly proportion of senior executives in airlines throughout the world. The courses have become renowned not only for the erudition of their lecture sessions but, no less, for their concluding Farewell Dinners, and for the efficiency of the arrangements under the benign Miss E. B. Croad.

On the technical side at Hamilton Place, when Dr. Ballantyne arrived at the Society, there was a technical staff of only four and there were but two active technical committees. The budget for 1951 was £2000. How things have been developed and expanded since then is shown by the fact that in 1972 the turnover reached £150 000. From the start, Dr. Ballantyne took full responsibility for the work. He appointed the staff and selected and invited members to serve on a growing number of technical committees. In 1963 the scope of the Data Sheets was widened, in conjunction with the Institution of Mechanical Engineers, to cover mechanical engineering and, later,



13th Anglo-American Aeronautical Conference, London, 1973. L to R—Bob Dexter (Secretary, AIAA), Dr. Ballantyne and Charles Luttman (Secretary, CASI).

structural and chemical data as well. In 1964 the Technical Department was renamed The Engineering Sciences Data Unit and, in 1971, it was formed into a Limited Company wholly owned by the RAeS.

This work alone would have been regarded as a major contribution by the Society to the world of aeronautics and engineering generally. But it is only one of the many advances which have come about during the Ballantyne era. There was the construction of the Lecture Theatre, opened by Lord Brabazon in 1960. There has been the growth of the numbers of Branches of the Society (from 21 in 1951 to 31 in 1973) and the build-up of Groups and Sections from only the Graduates' and Students' Section in 1951 to ten specialist Groups and Sections today.

Material progress during the 22 years is best illustrated by a few of the Society's vital statistics which have expanded vastly—while Archie Ballantyne's own have remained virtually unaltered.

Between 1951 and 1972 the Society's Membership grew by 64%; from 7684 to 12 688. In the same period the Society's annual income and expenditure has increased from £30 000 a year to £186 000 pa. The growth continues.

But most of all, we of the Society all have our memories of Archie Ballantyne himself down the years in a variety of roles—supporting successive Presidents on the platform and at Council Meetings—Maureen Michael decoratively at his right hand—visiting Branches; representing the Society on committees, at functions and at dinners across the world; dancing gaily with Mrs. Ballantyne; sailing, mountaineering; invariably but quietly the centre of any party—and most cheerfully in his native Scotland.

Progress combined with tradition has been the watchword; distinctive in the celebration of the Centenary and in the, proper, resistance of a suggested change of name to the "Royal Aerospace Society". No one can doubt that the prestige and the standing of the Society has grown throughout the Ballantyne epoch.

And now his host of friends wish Archie and Catherine Mary Ballantyne long life and much happiness in the years ahead. They will both always be welcome to return to 4 Hamilton Place whose flag they have kept flying high through all the 22 years 1951 to 1973.

With happy memories of the Flying Years in what one friend from America calls "4 Ballantyne Place", we now look onwards to the Schaffter Succession as the inheritor of a great tradition—the Ballantyne Years.

Results of the postal voting on changes to the By-Laws

I	By-Law 1. Definition of Voters A Council Proposal— "In accordance with the Charter, voters are defined as Fellows and Members"	Votes received A 1385
	B Amendment— that the existing Associates retain their voting rights i.e. the By-Law would read "In accordance with the Charter, voters are defined as Fellows, Members and those Associate Members who were elected to the class of Associate before 31st December 1973." (At the General Meeting the amendment was carried by 20 votes to 18)	B 1974
11	By-Law 2(A) Classes of Membership A Council Proposal— "There shall be six classes of membership of the Society, which shall be termed respectively Fellow, Member, Associate Member, Student, Associate and Companion."	A 2345
	B Amendment— that the present nomenclature in all classes be retained, i.e. the By-Law would read "There shall be six classes of membership of the Society, which shall be termed respectively Fellow, Associate Fellow, Associate, Graduate, Student and Companion." (At the General Meeting the amendment was defeated by 27 votes to 16)	B 1012
111	By-Law 2(B) Fellows (Second paragraph) A Council Proposal— "Applicants for Fellowship must be proposed by a Fellow and supported by three other Fellows: in exceptional circumstances this requirement may at the discretion of the Council be relaxed. Every candidate for election into class of Fellow shall be a Member or possess the qualifications necessary for Membership."	A 3027
	 B Amendment— that the second paragraph of By-Law 2(B). Fellows, should read:—"Applicants for Fellowship must be proposed by a Corporate member and supported by three other Corporate members. Every candidate for election into the class of Fellowship shall be a Member or possess the qualifications necessary for Membership." (At the General Meeting the amendment was heavily defeated with only one vote being cast in its favour) 	B 342
IV	 By-Law 2(C) Members (Second paragraph) A Council Proposal— "Applicants for Membership must be proposed by a Corporate member and supported by three additional Corporate members. In the case of applicants under By-Law 2(C)(b) at least two of these shall be Fellows; in exceptional circumstances this requirement may at the discretion of the Council be relaxed." 	A 3044
	 B Amendment— that the second paragraph of By-Law 2(C), Members, should read:—."Applicants for Membership must be proposed by a Corporate member and supported by three other Corporate members." (At the General Meeting the amendment was heavily defeated with only two votes being cast in its favour) 	В 309
v	 By-Law 3(E) Abbreviated Titles A Council Proposal— "Fellows and Members may use the following abbreviated form to indicate the class in the Society to which they respectively belong, namely F.R.Ae.S. and M.R.Ae.S. Any person who has been awarded the title Honorary Fellow may use abbreviation Hon. F.R.Ae.S." 	A 742
	 B Amendment— that the existing Associates retain the right to use designatory letters, i.e. the By-Law would read "Fellows, Members and Associate Members, may use the following abbreviated form to indicate the class in the Society to which they belong, namely F.R.Ae.S., M.R.Ae.S., and A.M.R.Ae.S. Any person who has been awarded the title Honorary Fellow may use the abbreviation Hon.F.R.Ae.S." (At the General Meeting the amendment was carried by a large majority with only three votes being cast against it. The Council would be happy to accept the amendment in respect of <i>all</i> Associate Members, if it is allowed by the Lords of Her Majesty's Most Honourable Privy Council) 	B 2608

VI	By-Law 8(D) Ordina A Council Proposal—	ry Members of the Council (Second paragraph) - "Of the Ordinary members of the Council, at the time of their election a) at least ten shall be Fellows b) at least two shall be Members c) three others only shall be Associate Members and they shall be elected by the Associate Members only. Of these three one at least shall be an Associate Member qualified under By-Law 2(D)(a) and not more than thirty years of age."	A 2949		
	 B Amendment— that "of the Ordinary members of the Council, at the time of their election a) at least eight shall be Fellows b) at least six shall be Members c) three others only shall be Associate Members." (At the General Meeting the amendment was rejected unanimously) 				
VII	By-Law 1 to 25 and Appendices				
	Council Proposal-	That the new By-Laws and Appendices as submitted to the Voters at the General Meeting on 10th May 1973, with the exception of those By-Laws that are subject to	For 3337		
		votes numbers I to VI on this voting paper, be accepted. (At the General Meeting this proposal was carried unanimously)	Against 37		
VIII	Annual Subscription, Entrance and Transfer Fees				
	Council Proposal—	That the rates submitted to the Voters at the General Meeting on 10th May 1973 to become operative on 1st January 1974, be accepted.	For 3299		
		(At the General Meeting this proposal was carried unanimously)	Against 68		