Irish Meteorological Society

Newsletter

Number 22 **May 1990**

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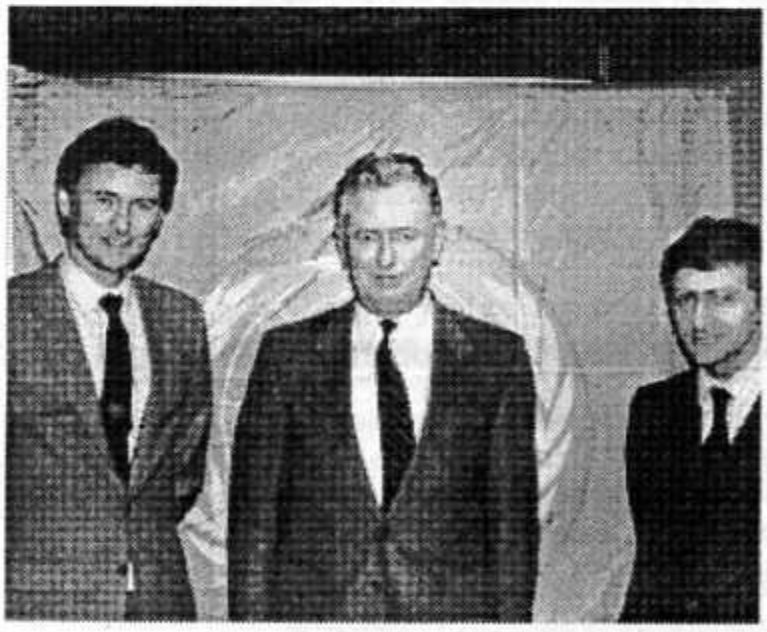
1. A resume of the lecture given by Capt. Kilian Tormey on "The Wright Brothers".
2. Reports from the Secretary and Treasurer given at the A.G.M.
3. Elections to the Commmitte at the A.G.M.



The Director of the Meteorological Service, Mr. Declan Murphy with Prof. J.E. Nash and the President of the Irish Meteorological Society, Dr. A. Roddy at the Society's lecture to mark World Meteorological Day, held in the Shell Theatre on March 22nd 1990.

Photo: Phillip Vardon

A. Kelly

Secretary

A resume of the lecture given by Capt. Kilian Tormey to the Irish Meteorological Society and the Royal Aeronautical Society (Dublin Branch) at the Shell Theatre, Dublin on 23.2.90. Over 100 slides were shown, mostly photographed by the Wrights themselves during their experiments.

The Wright Brothers

The Wright brothers were Wilbur (b. 1867) and Orville (b. 1871). They had two older brothers Reuchlin and Lorin and a younger sister Katherine. Their father was Bishop Milton Wright of the United Brethern Church who could trace his ancestry back to one Samuel Wright, a Puritan who emigrated to Boston from Essex in England in 1636.

The technology available to the Wrights when they became interested in aviation in 1899 was mainly theoretical and the lecture briefly touched on the work of Cayley, Wenham, Phillips, Langley, Lillienthal and Chanute.

After constructing a kite and two gliders in 1899, 1900 and 1901 they concluded that although their method of lateral control, namely wing warping, was effective and practical, the aeronautical data which they had inherited from Lillienthal for wing construction was in error. The error arose as a result of a constant known as the Smeaton factor in the formulae used for calculating lift and drag. The Smeaton value was .005 and the correct value as established by the Wrights from their own wind tunnel data was .0033. The difference accounted for the fact that their first two gliders could lift only about 60% of their calculated expectations.

As a result of their wind tunnel testing of over 200 aerofoil shapes in December 1901 they were able to accurately predict the performance of any new wing they would build. In 1902 they completed developement of their control surfaces which included wing warping for lateral control of the wings, a forward rudder (horizontal) or elevator and a moveable vertical rudder aft, which moved automatically in agreement with the wing warping system. They now had a gliding machine which could be turned left or right and could be climbed or descended under the control of the pilot.

In 1903 they built their first powered machine which they called their Flyer. During a six week period they designed and constructed their own engine to power it. The engine weighed 200lbs., was a horizontal in-line four cylinder type which produced 12h.p. They meanwhile set about constructing their propellors and achieved an extraordinary degree of efficiency with them. They had expected to be able to use nautical data on propellors which had been used in ships for the previous one hunderd years. However, they found that no scientific data was available as propellor manufacturers had only used empirical designs.

The first attempt to fly was made on 14th December 1903. This was unsuccessful, basically because of a lack of wind but also due to the fact that their control in pitch was unstable and very difficult for the pilot to manage. The result was a stall at 15ft approximately and the aircraft came down, slewed to the left and ended facing the direction from which it had come.

Three days later, after carrying out minor repairs, they tried again. This time they had a strong wind of 27mph to assist them on take-off. They completed three short hops of 120ft, 175ft and 200ft and then flew 852ft in 59 seconds.This last flight validated the previous short hops and the honour of being the first to achieve a heavier-than-air sustained, controlled flight taking off at and landing at the same height went to Orville. All of these experiments had taken place near Kitty Hawk in North Carolina.

The following year the Wrights moved their operations to their home town of Dayton, Ohio. After constructing a new machine they invited the press to attend their first flight. Unfortunately, due to a different meteorological situation which resulted in a density altitude difference of 4,700ft from the conditions at Kitty Hawk the previous year, the aircraft failed to fly. In other words, the lift available due to the air passing over the wings was greatly reduced and the power output of the engine would have been greatly reduced owing to the reduced atmospheric pressure available to charge the cylinders when the inlet valves opened. Because of this, they constructed a launching derrick which they used successfully on all their test flights and demonstrations until 1910.

By 1905 they had developed the first practical aeroplane. They attempted to sell it to the U.S Government but were unsuccessful. They then, remarkably, stopped flying completely for two and a half years in an attempt to protect their secrets and establish their patents on their control systems. They attempted to sell their invention to Britain, France and Germany but the only people interested were international financial intriguers who did not appeal to the Wrights.

However, in February 1908 the U.S. Army agreed to buy a machine for $25,000, if it could be demonstrated to carry two men for 125 miles at 40mph. In March 1908 a French syndicate came into being to promote the machine in Europe. The Wright brothers returned to Kitty Hawk to practise for their coming demonstrations but Wilbur crashed downwind at 50mph and cartwheeled. He then went to Europe and carried out a remarkable programme of demonstrations at Le Mans, Pau and Rome. Meanwhile, Orville had the first fatal, powered flying machine accident in history, resulting in the death of Lieut. Tom Selfridge at Fort Meyer, Virginia while demonstrating to the U.S. Army Signal Corps. He later joined Wilbur in Europe , watching him demonstrate in Pau and Rome.The brothers then began the long journey back to Dayton through Paris, Le Mans, London, New York and Washington where they were honoured at receptions in each city.

By 1910 aviation was now an established industry. Unfortunately, Wilbur contracted typhoid fever and died in 1912. Orville continued to look after the interests of the Wright Aeroplane Company but sold out completely in 1915. He died in 1948.

Thus ended this amazing story. That the solution to a quest which had lasted since man became aware of birdflight should have come from such an unexpected quarter testifies to their genius. Incredibly, all their testing and expenses up to the flights of the first Flyer in 1903 cost them less than $1,000.

Irish Meteorological Society

Secretary's Report

Since the last A.G.M. 6 lectures were organised as follows-

1) May 18th 1989 "Light, Seasonality and Mania" by Dr. Tony Carney.
2) Nov. 3rd 1989 "Hazards in the Indoor Environment" by Dr. J.P. MacLaughlin
3) Dec. 8th 1989 "The Greenhouse Effect" by Gerald Fleming
4) Jan.19th 1990 "Alternative Enegry-Generating Systems in Irish Lighthouses" by Seamus Doyle
5) Feb .23rd 1990 "The Wright Brothers" by Capt. Kilian Tormey
6) Mar. 22nd 1990 "Hydrology, Ireland and Disaster Mitigation" by Prof. J.E. Nash, to mark World Meteorological Day.

Lecture 4 was a joint lecture with the Solar Energy Society of Ireland and lecture 5 was also a joint venture with the Royal Aeronautical Society (Dublin Branch).

In the same period five Newsletters were produced, nos. 17-21 incl.
The Committee of the Society met on Sept 14th, Nov 3rd (1989) and Mar 22nd 1990.

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The **World Meteorological Organisation** responded to a request from the Society and provided us with a flag for our lecture to mark World Meteorological Day.

The **Irish Meteorological Service** has continued to allow the Society to use the facilities of the Service and I would like to express the Society's thanks and appreciation for this.

T.C.D. kindly provided the Ussher Theatre free of charge for lectures 1 - 4 but felt obliged to charge for subsequent lectures. The amount required could not have been met from the Society's funds so alternative venues were explored. Fortunately, **Irish Shell** allowed us the use of the Shell Theatre for lecture 4 for a nominal sum and **Carrolls** provided their theatre for lecture 6 free of charge. I wish to thank all involved for facilitating the Society. Attempts are underway to find a permanent base for lectures in the Dublin area.
Special thanks are due also to the **Department of the Environment** who are assisting with the cost of the One-day meeting on April 26th 1990.

The **Annual Outing** was to the Mace Head field station, west of Galway and en route, the Atmospheric Physics Laboratory in U.C.G. on May 12th. A most interesting and enjoyable day was had by all who made the trip. Special thanks are due to **Dr. Aodhgan Roddy, Dr. Tom O'Connor** and **Dr. Gerry Jennings** who made all the local arrangements and gave so freely of their time.

The terms of office of **Dr. A. Roddy, S. Finnegan** and **M. Connaughton** expire this year and I would like to pay tribute to each of them for the sterling service they have given the Society. They, and the other committee members, by their work, assistance and advice certainly made the running of the Society a lot easier.

Aidan Kelly
Secretary

Irish Meteorological Society

Statement of accounts to 31-Dec-1989

Income	
Membership (47 x £8; 39 x £4)	£ 532.00
Subscriptions to Weather Magazine 12 subs)	£ 197.09
One Day Meeting	£ 126.00
Overpayment of Standing Order	£ 36.00
Interest on Savings Account	£ 5.87
Forward Payment of Subscriptions	£ 60.00
Total Income	£ 956.96
Expenditure	
Stationary and Phone Calls	£ 27.47
Photocopier	£ 50.00
Postage	£ 25.00
Room Hire	£ 50.00
Subscription to Weather magazine (Bank Draft)	£ 258.25
Lectures' Expenses	£ 325.24
Annual General Meeting Expenses	£ 80.00
Sherry Reception	£ 51.10
Bank Charges (current account)	£ 23.74
Refund of Weather magazine subscription	£ 5.25
Total Expenditure	£ 896.05

Income vs Expenditure	
Total Income	£ 956.96
Total Expenditure	£ 896.05
Increase in assets	£ 60.91

Bank balance (current account) carried over from 1988	£ 32.64
Bank balance (savings account) carried over from 1988	£ 339.11
Cash in hand carried over from 1988	£ 51.41
Total assets from 1988	£ 423.16
Bank balance (current account) at end of 1989	£ 141.41
Bank balance (savings account) at end of 1989	£ 263.99
Cash in hand at end of 1989	£ 78.67
Total assets at end of 1989	£ 484.07
Increase in assets from 1988 to 1989	£ 60.91

Compiled by: S.Finnegan

Checked by:

Elections to the Committee at the A.G.M. 1990

The terms of office of Dr. A. Roddy, Mick Connaughton and Shane Finnegan expired under the four year rule. Tributes were paid to them for the outstanding contribution they had made to the Society. Dr. J.A Scott was elected President and Sean McCarthy was elected as Treasurer. Others elected were Evelyn Cusack and Seamus Walsh who make a welcome return to active service.

The full committee is as follows:

J.A.Scott	Re-elected 1990	President
S. Browne	Elected 1989	Vice-President
A. Kelly	Elected 1989	Secretary
J. Doyle	Elected 1989	Assistant Secretary
S.McCarthy	Elected 1990	Treasurer
M. Mansfield	Re-elected 1990	Assistant Treasurer
K. Commins	Elected 1989	
G. Fleming	Elected 1989	
M. Naughton	Elected 1989	
P. Vardon	Re-elected 1990	
E. Cusack	Elected 1990	
S. Walsh	Elected 1990	

A motion to increase the annual subscription was passed at the A.G.M.
From Jan. 1st 1991 the subscription will be £12 for those in the Greater Dublin Area and £8 for those outside it.

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Service News

Mr. Brendan MacWilliams has been appointed Assistant-Director of the Irish Meteorological Service. A long-standing member of the Society, Brendan has played a key role in publicising theSociety's events in his extremely popular column in the Irish Times.

Vincent Ryder, Andy MacManus and Bill Dalton were recently promoted to Principal Meteorological Officers. Our heartiest congratulations to all.