

newsletter

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As the first year of the existence of the Irish Meteorological Society draws to a close, we can look back with satisfaction at the successful launching of this new venture. We have heard a number of interesting lectures on diverse aspects of meteorology and had the pleasure of meeting fellow members from a wide variety of backgrounds.

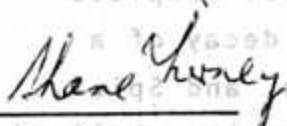
Our one-day meeting held in September was judged by all to have been a success. The lectures were of a high quality and offered great diversity. The large turnout has encouraged the Committee to think of planning a similar meeting and social occasion next year.

A lecture jointly sponsored by the IMS and the Geography Department, UCC, was given on the 14th October. Dr. Ray Bates spoke on "Weather Forecasting: Present and Future". This was the first lecture to be organized outside Dublin, and we hope it will be the first of many.

Dr. Edward Monahan lectured in Dublin on the 24th November on "Breaking Waves and Sea Spray: Their Role in the Formation of Aerosols in the Marine Atmosphere". A synopsis of Dr. Monahan's lecture is included in this newsletter. The meeting was attended by scientists from the Soviet research vessel "Passat" which was visiting Dublin at the time, on her way to carry out a study of the Gulf Stream and man ocean station "Charlie". The fluent Russian of IMS member, Mrs Lisa Shields, was used to good effect in welcoming the visitors and helping them to follow the lecture.

The Editor of the Royal Meteorological Society's Weather magazine has kindly written to our Secretary with an offer (subject to approval by the Council of the RMS) to provide the magazine at a reduced rate to IMS members. We include a questionnaire to see how many would be interested in availing of this offer.

May I take this opportunity to wish all our members a Happy Christmas and a Prosperous New Year.



Shane Tierney

President

BREAKING WAVES AND SEA SPRAY: THE INTRODUCTION OF AEROSOLS INTO THE MARINE ATMOSPHERE

BY E.C. Monahan

As one of the several current research efforts of the Physical Oceanographic programme within the Department of Oceanography, University College, Galway, we have undertaken to identify the specific mechanisms whereby significant numbers of aerosol particles are generated at the air-sea interface. To put this work in an historical perspective, we could be said to be elucidating Dr. Sigerson's observation of 1870 (Proceed. Roy. Irish Acad, Ser.2, 1-Sci.), that "The moisture is taken up from the waves by the wind in its course over them; and, whilst so suspended in the air, favoured by its agitation, the crystals are frequently formed". It is the goal of the present research to develop an explicit physical model that may be used to predict the rate of production of aerosol particles at the sea surface for any given set of meteorological conditions.

At its present stage of evolution the expression for the rate of production of aerosol particles, per unit area of sea surface, consists of two terms. The first of these represents the aerosol production that results from the bursting of the whitecap bubbles which form when waves 'spill' or 'plunge' at sea. The other term is a measure of the spray droplet production associated with the mechanical disruption of wave crests at high wind speeds.

While the actual mechanisms whereby a bursting bubble produces jet- and film-droplets have been investigated by Prof. Blanchard (Progress in Oceanogr., 1, 1963) and Dr. MacIntyre (J. Geophys. Res., 77, 1972) among others, we have had to undertake a series of experiments in the U.C.G. whitecap simulation tank to determine the number of aerosol droplets in each size range that are produced during the decay of a whitecap of known initial area (Monahan, Davidson, and Spiel, J. Geophys. Res., in press). By coupling the results obtained from these laboratory studies with the description of the wind-

dependence of oceanic whitecap coverage (Monahan and O'Muircheartaigh, J. Phys. Oceanogr., 10, 1980) derived from extensive shipboard photographic studies (Monahan, J. Phys. Oceanogr., 1, 1971; Toba and Chaen, Records Oceanogr. Works Japan, 12, 1973), we have been able to quantify the 'bubble-contribution' term. Planned simulation tank experiments will lead to further refinements of this expression.

An initial formulation of the 'crest-contribution' term has been achieved from a re-analysis of the data from the wind-wave-flume experiments of Prof. Wu (J. Geophys. Res., 78, 1973), and of Drs. Lai and Shemdin (J. Geophys. Res., 79, 1974), but confirming field measurements are needed.

Noting that our research has benefited greatly from our participation in several recent, international, air-sea interaction field programmes (i.e., Joint Air-Sea Interaction Project carried out in 1978 in the vicinity of Rockall; and Storm Transfer Response Experiment conducted in 1980 in the Gulf of Alaska), we look forward with anticipation to such future experiments as the Humidity Exchange Over the Sea experiment planned for the North Sea. We continue to carry out aerosol and space charge measurements at our field station on the southwest shore of Inishmore, near Gort na gCapall. All these field observations will ultimately be useful in the testing of a marine atmospheric boundary layer aerosol/salt budget model, of which the sea surface aerosol production expression is just one component.

Dr. Spillane, Dr. Stabeno, and other members of our group are currently working on related questions, such as the determination of the global sea-air salt flux, and the matter of the influence of oceanic whitecaps on global albedo.

ANNOUNCEMENTS

Lecture Notice

"Weather, Potato Blight and the Famine"

by

Dr. Austin Bourke

Place: Shelbourne Hotel, Dublin

Time: Wednesday 2nd February 1983, 8p.m.

Annual General Meeting

The second AGM of the Society will be held at the Clarence Hotel, Wellington Quay, Dublin on Friday 4th March 1983 at 8p.m. The Agenda will be as follows:-

1. Secretary's Report
2. Treasurer's Report
3. Election of Committee Members.

The first terms of half the committee members will expire. Membership terms will in future be staggered, each term being for two years. The names of the committee members whose terms now expire will be determined by drawing lots.

4. Discussion of Activities
 5. Any Other Business
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Annual Guest Lecture

The second Annual Guest Lecture will be given by Sir John Mason, Director-General of the UK Meteorological Office, on Wednesday 30th March 1983. Details will be announced later.

Prospective members are welcome at all meetings.

Questionnaire

A possibility exists that the Royal Meteorological Society may be prepared to offer their monthly general-interest magazine Weather at a reduced rate to members of the Irish Meteorological Society. If sufficient interest is shown, the RMS would encourage submission of articles by our members, carry news items of interest to us and extend the Weather Log, which accompanies Weather, to include monthly statistics for Dublin and Valentia.

Those who are not familiar with Weather may look through it at the Meteorological Service Library, Glasnevin, Dublin, the Meteorological Office at Shannon Airport, the Met. Service Training School at Dublin Road, Galway or the Belfast Weather Office, 1 College Street, Belfast.

The current subscription rate to Weather for non-RMS members is £12 sterling per annum, including postage. It is possible that a reduced subscription in the region of £10 sterling for our members can be arranged.

If you would be interested in availing of such an arrangement, please detach the form below and send it to our Secretary, Dr. R. Bates, C/O Meteorological Service, Glasnevin Hill, Dublin 9.

I would be interested in subscribing to Weather at
a reduced rate

Name:

Address:

Comments: