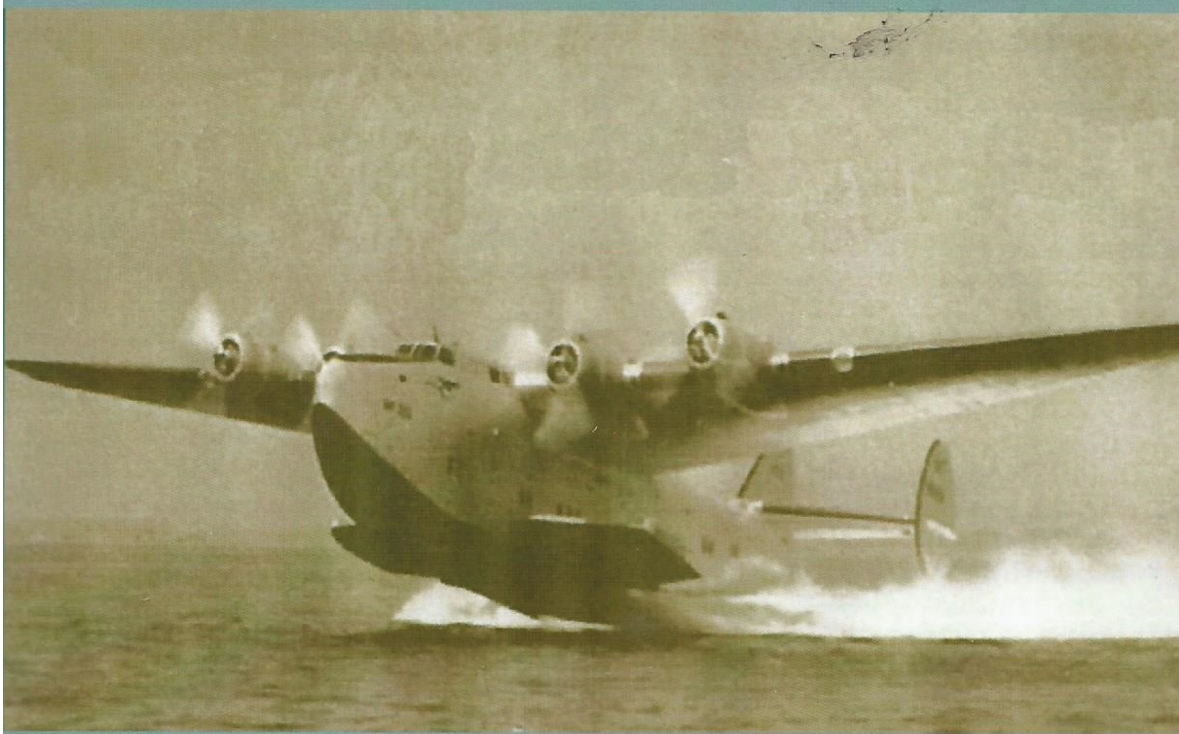


Establishment of the Meteorological Service in Ireland

THE FOYNES YEARS, 1936-1945



HOW WEATHER FORECASTING BEGAN AT FOYNES



Tom Keane

Establishment of the Meteorological Service in Ireland

THE FOYNES YEARS, 1936-1945

THE FOUNDING of the Irish Meteorological Service in 1936 makes for a fascinating story, one largely associated with the flying boat seabase era at Foynes. Seán Lemass, then Minister for Industry and Commerce, eager to establish Ireland's place in civil aviation, was committed to providing the associated infrastructural supports - airports, communications and meteorological services.

FROM THE OUTSET, the British authorities were helpful with the smooth transfer of the existing meteorological network to Irish control and provided the initial expertise at Foynes in 1937 and 1938.

THE FIRST professional meteorologists recruited to the Irish Service comprised university graduates of diverse backgrounds sourced in Ireland, Britain and 'refugee' scientists from war-stricken continental Europe. These were supported by a well-educated assistant grade whose members in turn joined the Service with high expectations.

THE IRISH SERVICE overcame such difficulties as the onset of World War II with its attendant impacts on a neutral country, limitations of manpower and the large increase in flights transiting Foynes due to war restrictions on other routes.

NEVERTHELESS the Irish Meteorological Service succeeded in attaining a well-deserved reputation for its professional service to aviation at the Shannon (Foynes and Rineanna) and Dublin airports, to Air Defence and at the same time serving, as best it could, other demands of the Irish state.

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Tom Keane began his career in the Irish Meteorological Service at Dublin Airport and Valentia Observatory. After graduating from University College Galway with a B.Sc. (hons) degree, he became a forecaster at Shannon Airport. He transferred to HQ in Dublin as Operations Research Officer and later Head of Agricultural Meteorology. As Senior Meteorologist and Head of Research & Applications in Met Éireann he retired at the turn of

the Millennium.

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Establishment of the
Meteorological Service in Ireland
- the Foynes years 1936-1945

Tom Keane

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Acknowledgements

At the instigation of the then Director, Kilian Rohan, in 1978 I was given access to the ‘Secret’ files of the Meteorological Service, retained in the Director’s Office at 44 Upper O’Connell St., Dublin 1. The objective was to compile an account of the establishment and early (Foynes) years, 1936 to 1945, of this newly formed Irish service cum scientific organisation.

As the seventy-fifth anniversary year, 2011/12, of the foundation of the Irish Meteorological Service (now Met Éireann) approached, I reformatted this report. Updates included here are reminiscences of former colleagues of that time as published in ‘The Meteorological Service– The First Fifty Years, 1936-1986’ (referred to hereafter as IMS-50) and extracts from the official files, now placed in the National Archives, of the Meteorological Service (available from January 2012), the Departments of An Taoiseach (Government) and Foreign Affairs, and the Establishment Section of the Civil Service, on correspondence with the Department of Industry and Commerce relating to the Meteorological Service (Department of Industry and Commerce files on the Meteorological Service per se could not be found), together with other archived material both in this country and in Britain.

I wish to thank many retired and former colleagues in Met Éireann for their kind assistance: Paddy Lyons, retired O.C., Shannon Airport, for his notes, background material and relevant meteorological documents in his possession; Declan Murphy, retired Director of Met Éireann, for leads to published articles; Paddy (P. V.) Kelly, Ultan Egan, Joe O’Brien and Joe Graham for their recollections of the period; Mairéad Treanor, Librarian (HQ), Colm Faherty (HQ), Tim Gallagher (Casement), Donal Shine (Belmullet), Emily Gleeson and Anne McWilliams for their willing assistance with research and photographs.

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My special thanks to Eamon Murphy for his prompting me to undertake the task and his subsequent review and proof reading the document, and to Liam Campbell, Director of Met Éireann, for his support and encouragement in the publication of the work. Finally, I wish to acknowledge with love my wife Maureen for her valuable insights and forbearance while bringing this work to fruition.

Tom Keane
March 2012

Meteorological Services - Ministerial Statements to the Dáil

The establishment of meteorological services in *Saorstát Éireann* (Irish Free State) was undertaken on the initiative of Seán Lemass, Minister for Industry and Commerce and his officials. The situation came to a head with the imminence of trans-Atlantic air flights between Europe and North America in the mid-1930s. The following extracts are taken from discussions on the Votes by the Committee on Finance of *Dáil Éireann* (Irish Parliament) relating to ‘Transport and Meteorological Services’.

‘It is, I think, generally known that the rather limited meteorological service at present in existence in the Saorstát has hitherto been maintained by the United Kingdom Government. Arrangements are being made for the transfer of this service to the control of the Saorstát Government, and it is our intention to develop it into a first-class meteorological service, and I may say incidentally at this point that the United Kingdom Government has agreed to contribute £6,000 per annum towards the cost on the basis of services rendered.’

Mr Thomas Derrig
Minister for Education
Acting for Minister for Industry and Commerce
Dáil Éireann August 1936

‘The meteorological service of this country will have a much greater importance than the meteorological service provided by other countries while, at the same time, our ability to pay for a first class service is limited. Consequently, we must try to make our service, while small, of excellent quality. On that account, a very high standard of efficiency and training will be required from those appointed to permanent posts in it.’

Mr Seán Lemass
Minister for Industry and Commerce
Dáil Éireann July 1937

‘Our meteorological service at the present time is mainly employed in connection with civil aviation services. I think it is true to say that it has been very efficiently run, so efficiently that it has established an international recognition for competency. I have received from other Governments that have had contact with our service very substantial praise of its efficiency. We are, of course, in a key position so far as the meteorological services in Europe are concerned. All weather comes from the west, and the efficiency of the meteorological services in all European countries depends very largely on the efficiency of the service in this country. Consequently, it helps to enhance our prestige internationally when our meteorological service is fully developed and efficiently run.’

Mr Seán Lemass
Minister for Industry and Commerce
Dáil Éireann, February 1944

Preface

The establishment of the Meteorological Service, together with the setting up of a national airline, Aer Lingus, and the provision of related infrastructural and telecommunications services, were among Ireland's major achievements of the 1930s. The country's upcoming involvement in cross-Irish Sea air transport and in trans-Atlantic aviation services was also significant for Ireland's stake in international affairs. The Meteorological Service was an integral part of that development. Politically, times were in a state of great uncertainty, and the onset of World War II had considerable impact on the fledgling services. Despite the apparent insurmountable difficulties, the Meteorological Service succeeded in establishing, within a short time frame, an important role in the welfare of the country and a very creditable international reputation.

The study period (1936-1945) holds much fascination for the author, but also, it is believed, for those interested in aviation meteorology. A wide range of material has been consulted. Sources include: Meteorological Service (Met Éireann) and Departmental files; National and Military Archives, Dublin; The National Archives, London; Foynes Museum and Archive; The Meteorological Service 1987 publication on *The First Fifty Years, 1936 –1986*; reminiscences of staff, still happily with us, of events of the period; an extensive bibliography and a number of related photographs.

An explanation of the varied titles given to the different meteorological organisations referred to in this study may be useful. The Meteorological Service was initially entitled Saorstát Meteorological Service. With the coming into effect of the Irish Constitution in December, 1937, when the State became known as Éire, or in translation, Ireland, the opportunity seems to have been taken to simply refer to the service as the Meteorological Service. While retaining its formal title, the service soon became known informally either as the Met Service, the Irish Met Service or for greater emphasis the Irish Meteorological Service. In formal communications with Ireland at that time, the British authorities referred to it as the Éire Meteorological Service.

In contrast, the meteorological organisation in the United Kingdom was known as The Meteorological Office, but also referred to as the Met Office, MO and UKMO. On occasions in this report, the name British Met Office is used for additional clarification. To add to this author's editorial difficulties, operational meteorological offices at the airports were also known as Met Offices. To avoid confusion for the reader, operational meteorological offices in Ireland are designated with the relevant airport, Dublin Airport (Collinstown), Foynes, Rineanna. In respect of Foynes and Rineanna, these were officially referred to jointly as The Shannon Airport; in many cases in the literature any of three names, Foynes, Rineanna, Shannon, were used irrespective of the landing base in question.

In memory of Meteorological Service colleagues,
who discharged so well the great demands placed on them
during those pioneering Foynes years

Despatch No. 1 170

Sir,

I have the honour to refer to your despatch No. 102 of the 27th August last regarding the transfer to the Government of Saorstát Éireann of the Meteorological Service in the Saorstát.

2. In accordance with the wishes of the Air Ministry preliminary informal discussions took place in Dublin and a provisional Agenda for the formal discussions was drawn up. My Government consider that as the Saorstát Éireann Meteorological Service has now been instituted the formal discussions suggested by the Government of the United Kingdom in your despatch under reference should take place immediately. They are arranging accordingly for representatives of the Saorstát Éireann Departments concerned to travel to London for a meeting on Monday, the 14th December, which date, it is understood, is suitable to the Air Ministry.

I have the honour to be,

Sir,

Your most obedient,
humble servant,

Éamon de Valera

Minister for External Affairs.

Right Honourable
The Secretary of State,
Dominions Affairs,
Downing Street,
LONDON, S.W. 1.



Fig. 1 Letter (December 12, 1936), from Éamon de Valéra as Minister for External Affairs, notifying the UK Secretary of State, Dominions Affairs, of Irish delegates travel arrangements to London for the formal discussions set for December 14 on the takeover of the Meteorological Service network in Saorstát Éireann (National Archives, London)

I

How Weather Forecasting began at Foynes

Many references to exceptional floods, droughts or other calamities associated with weather have been found in the ancient Annals of Ireland. Since the seventeenth century, several eminent Irish scientists have contributed to the development and understanding of meteorology. Typical of these were: Robert Boyle (1617-1691), associated with improvements to the barometer and thermometer and the establishment of the well-known Boyle's Law relating gas pressure to volume; Hugh Hamilton (1729-1805) who enunciated the role of evaporation and condensation in cloud formation; Admiral Sir Francis Beaufort (1774-1857) who developed the still widely-used Beaufort wind scale; Sir George Gabriel Stokes (1819-1905) who designed the Campbell Stokes sunshine recorder; Robert Henry Scott (1833-1916) who became Director of the British Meteorological Office and was instrumental in founding Valentia meteorological observatory; and many others. Weather diaries were also kept by individuals, mainly the Anglo Irish gentry, such as physicians (e.g. John William Moore), Quaker families (e.g. Dr John Rutty (1697-1775), an eminent Quaker concerned with the influence of weather on disease) and many others.

From the early nineteenth century, regular meteorological observations were made at an increasing number of locations. Observatories were established in such diverse places as Armagh (1790s, James Archibald Hamilton as first Director), Markree Castle (Cooper family, regular observations since 1863), Birr (Earl of Rosse,

Establishment of the Meteorological Service in Ireland

mainly since 1872) and Valentia Observatory (1860). Records also commenced at the National Botanic Gardens around 1800 and the Ordnance Survey in the Phoenix Park from 1829. Ireland benefitted greatly with the establishment of the Meteorological Office in Britain in 1854 and the subsequent setting up of a number of coastal telegraphic reporting stations, and a network of climatological and rainfall stations in Ireland. The data from these were regularly returned to London for archiving.

By the twentieth century some interest had been expressed in organising our own meteorological affairs. For example, the Department of Agriculture and Technical Instruction had been conscious of the need for a specifically Irish meteorological service. About 1910 they sent a questionnaire to meteorological services in many countries to ascertain how they were organised but nothing developed from this initiative (Dixon, unpublished note). After the 1922 Treaty establishing the Irish Free State, Ireland's weather observing stations and forecast services (e.g. to the newspapers, Electricity Supply Board (ESB), Air Corps¹) continued under the control of the Meteorological Office in Britain. This position remained throughout the 1920s and well into the 1930s despite periodic reviews and the Ministers and Secretaries Act of 1924 vesting the functions for meteorological responsibility in Ireland under the Department of Education, climatology probably being viewed as an adjunct to the geography curriculum.

The imminence of commercial flights between Britain and France and New York, and Ireland's westerly position *vis-à-vis* Europe with the North Atlantic, together with an increasing demand for meteorological services finally provided the impetus for the Irish Government and the Department of Industry and Commerce in particular, to establish national meteorological services in this country. The Irish Meteorological Service was thereby established in December 1936.

¹ By the end of 1922, there were fourteen trained pilots in the Air Corps (Cronin, 2011).

How Weather Forecasting began at Foynes

While a meteorological service had many functions both national and international, little wonder then that at the outset the Irish Service became closely linked with aviation. Thus began the first and exciting phase for the Irish Meteorological Service, now entitled *Met Éireann* and in its seventy fifth year. This phase, termed here the Foynes years, 1936-1945, is the subject of this discourse.

Land aircraft were not yet dependable over long ocean routes where adverse weather systems were likely to be regularly encountered, and with the demise of the ill-fated Zeppelin, flying boats showed a greater possibility for success in the 1930s. In order to keep the direct Atlantic route from Great Britain to New York within the range of the then American and British flying boats, Foynes in County Limerick, a site chosen (pending the development of Rineanna) after a national survey by pioneer aviator Charles Lindbergh, and Botwood in Newfoundland were selected as intermediate stops.

The Irish Government accepted the challenge to participate in this exciting undertaking and agreed to the provision of the necessary support landing facilities, radio communications, air traffic control and meteorological services. As yet to acquire the necessary expertise in aviation meteorology in this country, the Irish and British authorities agreed that the British Met Office would operate the Foynes airbase on an agency basis, particularly during the test trial flights. Later, the onset of World War II in 1939 was to have a profound impact on the course of developments at Foynes.

A number of phases of development in the Irish Meteorological Service can be identified during those pioneering years. Three of these relate to Foynes: the initial agency years when the Met Office in Foynes was manned by British Meteorological Office personnel during the experimental and proving flight years, 1937 and 1938; the recruitment in 1939 of a cohort of Irish professional and assistant staff both from the south and north of Ireland, from Great Britain and the employment of ‘refugee’ meteorologists from war torn Europe, to take over and expand the work of the Service; and thirdly, the seconding of Clerical Officer

Establishment of the Meteorological Service in Ireland

civil servants to the Meteorological Service arising from the necessity to encipher, under strict security, the various weather reports exchanged between landing bases and aircraft during the war years.

To add to Foynes Met Office difficulties, the meteorological data available for analysis and forecasting were greatly curtailed due to wartime security between belligerent countries and much effort was put into surmounting these problems. The ever increasing numbers of flight operations taking place at Foynes became especially burdensome on meteorological staff at the Foynes Met Office leading to much discontent there. Finally, the need to man the Dublin Airport Met Office, the development of a Climatological Section and the expansion of the Service to provide for other sectors of the economy all competed for scarce staff resources.

II

Founding of the Meteorological Service

Background

On the initiative of the Department of Industry and Commerce, representatives of the College of Science, UCD and of the Departments of Finance, Education, Defence, Agriculture and Posts and Telegraphs assembled in conference in November, 1935 to consider with representatives of the Department of Industry and Commerce the provision of meteorological services in *Saorstát Éireann* (Irish Free State).

Since the formation of the State in 1922 the Meteorological Office of the British Air Ministry continued to hold responsibility for operating the network of weather observing stations in Ireland and providing forecasts for the public on radio and in the newspapers, for the Electricity Supply Board (ESB), the Air Corps¹ and dealing with climatological enquiries. These services were provided by the main forecast office in London although, prior to 1922, a Local Meteorological Forecast Centre had been established in Baldonnel aerodrome in 1919. Upper air temperatures and humidity readings were also made by aircraft from there. The aerodrome was closed in April, 1922 and the duties transferred to Collinstown. Observations from

¹ Baldonnel was supplied by the Met Office, London with the daily forecast issued at 07 hours: by post in the 1920s (arriving 1-3 days late), by telephone in 1930, ceasing in 1931, and then occasionally on request via Valentia Observatory (transmission costs being a factor) as Baldonnel were unable to receive the Rugby broadcasts (O'Malley, 2010).

Establishment of the Meteorological Service in Ireland

Collinstown also terminated in the autumn of 1922 with the evacuation of the British Forces from Ireland.

On formation of the new Irish Free State, responsibility for meteorological matters continued to remain with the Department of Agriculture and Technical Instruction. As early as August 1922 the Department had made arrangements with the Ordnance Survey station in the Phoenix Park for the 10.30 hour weather observation to be passed on to the newly formed Air Service in Baldonnel but these reports proved of little value (O'Malley, 2010). Under the Interpretation Act, 1923 and by an Order under the Ministers and Secretaries Act, 1924, the functions in connection with meteorological services were then vested in the Minister for Education.

An Inter-Departmental Committee on the question of Irish take-over first reported in May 1925, recommending the establishment of a meteorological service in this country. Over the next decade the subject was raised a number of times: in 1928 the Department of Industry and Commerce circulated a memorandum on the issue of transfer from the Department of Education who had no problem with it; in 1934 the Department of Education produced a memorandum on whether a national meteorological service should be established (but this was withdrawn from the Executive Council Agenda, September 4, 1934); and in May 1936 the Department of Industry and Commerce again brought forward the issue giving an estimated initial outlay of £1,800 capital expenditure and an annual cost of £13,000 expected to increase with a full organisation to £10,700 and £24,350 respectively.

In the middle of the 1930s it was realised that a change was necessary as there was an increasing demand for weather forecasts in Ireland. Following a departmental conference and a decision by Government in 1936, an Order was made in Executive Council under the Ministers and Secretaries Act transferring to the Department of Industry and Commerce the functions in regard to meteorological services allocated to the Minister for Education under the Ministers and Secretaries Act 1924 (see Statutory Rules and Orders 1936, No. 276).

Founding of the Meteorological Service

No Motion or Resolution of Approach was needed for the set up/transfer of Meteorological Services, but papers relating to the Redistribution of Public Services Order, 1936 were laid before the Houses of the *Oireachtas* for the statutory period, expiring March 12, 1937 (file S 8644, National Archives).

A demand for weather forecasts arose from: (a.) aviation, (b) shipping, (c) certain industries, including agriculture, and (d) the general public. In previous considerations of meteorological services in the *Saorstát*, the aviation interest was not prominent. The development of aviation and the prospect of the early establishment of air transport services, including possibly trans-Atlantic services, then attached to this interest an importance which outweighed all the others. The Irish Government first proposed the transfer on June 16, 1936 and on August 27, 1936 the British agreed to it in principle.

The Overseas Division in the British Meteorological Office was formed in October 1935 to deal with, among other things, the projected trans-Atlantic routes. Mr M. F. Entwistle was appointed Superintendent of the Overseas Division. Trans-Atlantic Route proposals included the establishment of forecasting organisations at the terminal bases in Newfoundland and Ireland. A special conference in Ottawa, attended by delegates from Great Britain, the Irish Free State, Newfoundland and Canada, met in November, 1935. The Irish representatives were John Leydon and J.P. Walshe, Secretaries of the Departments of Industry and Commerce and External Affairs respectively.

The participation of the Irish Free State raised among other questions, that of the meteorological organisation in Ireland and the control of the meteorological service at the eastern terminus of the trans-Atlantic air route.² Following the Ottawa conference discussions

² The need for the transfer of responsibility was accentuated when Ireland signed, in May 1936, the (1929) Warsaw Convention on the carriage of persons etc. by aircraft whereby each country was responsible for providing services, including those over the waters adjoining its shore. The Air Navigation and Transport Bill was passed by the *Dáil* at the same time.

Establishment of the Meteorological Service in Ireland

were held in Washington with a view to securing agreement based on the principle of full reciprocity in the establishment of a trans-Atlantic air service connecting the countries concerned.³

At a subsequent meeting between the Department of Industry and Commerce and officials of the British Meteorological Office (BMO) at the Air Ministry in London, Sir George Clarke Simpson, Director of the BMO, characterised the trans-Atlantic forecasting which the *Saorstát* had to undertake as ‘the most difficult and responsible forecasting in the world’. The chief reasons for this were the distance from land to land, some 1850 nautical miles, and the severe meteorological conditions liable to be encountered en-route.

Appointment of First Director

With the decision to take over and expand the meteorological services in the *Saorstát* under the Department of Industry and Commerce, it was necessary to appoint a Director of Meteorological Services to take charge of the organisation and development of the service. As there was nobody then in the *Saorstát* with the requisite knowledge and experience for the discharge of the functions of a Director, it was thought necessary to look to outside sources for a person with the required qualifications.

The name of A.H. Nagle, B.Sc., A.R.C.S., D.I.C., born November 1, 1903, Technical Officer and Senior Professional Assistant, Meteorological Office, London, was submitted to the Department (on the advice of Sir George Simpson) as a suitably qualified person for the post of Director. To overcome the then Irish nationality requirement, on October 23, 1936 T.J. Flynn, Assistant Secretary, Department of Industry and Commerce, wired Entwistle in the British Met Office

³ A joint operating company was planned with 51 per cent of capital to be supplied by the UK and 24.5 per cent each by Canada and Ireland. This company did not come into being.

Founding of the Meteorological Service

urgently seeking information on Nagle's (whose mother was English) Irish attachments and received the reply: 'PATERNAL GRANDPARENTS IRISH BORN OF PURE IRISH STOCK PRESENT IRISH ATTACHMENTS FAMILY AND SOCIAL ENTWISTLE'. The Department's subsequent submission to Government with some embellishment wrote 'Mr Nagle's family was one of the oldest Catholic families in Ireland - records going back to 16th Century and had entree to official, business and social circles in the Free State'.

Born in Birmingham, Austen Harold Nagle graduated from Imperial College of Science and Technology, University of London, and served in the British Met Office, 1927 - 1936. It was also stated that his experience was wide and covered practically every branch of meteorology. He had taken a leading part in organising meteorological work in the Royal Navy as a senior scientific officer. Forecasting experience included six months as a meteorologist to HMS Challenger during Atlantic Cruise, experience in Aviation Division and in training naval forecasters. Mr Nagle was recommended for the post of Director with, it was stated, 'more confidence than several, perhaps the majority, of the more experienced technical officials in the Meteorological Office'. Invoking 'public interest clause' for employment of a non-national (file annotation: 'much as I dislike its use'), the Department recommended Nagle to Government. He was appointed Director on December 8, 1936 and assigned offices at 14-15 Andrew St, Dublin.⁴

Austen Nagle was quickly involved in his new appointment. It had already been proposed that the official title of the new service should be Meteorological Section, Transport and Marine Branch, Department of Industry and Commerce. Nagle argued however that this title would imply a limited function, that international meteorology must also be covered as well as general forecasting. He submitted instead the service

⁴ When transferred from the British to the Irish Civil Service the British authorities favourably regarded Nagle's initial two years' service in Ireland as a secondment without loss in accumulated pension rights if he were to return, and also agreed to waive their right to the notice normally expected on retirement from service.

Establishment of the Meteorological Service in Ireland

should be entitled *Saorstát* Meteorological Service, Department of Industry and Commerce. This title was readily accepted (see W.S.1⁵).



Austen Nagle, 1939

The next task of the new Director was to define the role and responsibilities of the Irish Meteorological Service. These he specified within days of taking office as:-

(a) The collection, study and publication of meteorological data and the investigation of meteorological and geophysical problems.

(b) The supply of forecasts, statistical information and technical advice on the application of meteorological science in various fields to industrial and public utility undertakings, the press, the broadcasting authorities, individual members of the public.

⁵ The prefix W.S. (Weather Service) for the Meteorological Service filing system rather than the more obvious M.S. prefix appears to have been adopted due to the fact that the Marine Section of the Department of Industry and Commerce had been using M.S.

Founding of the Meteorological Service

(c) The supply of similar information to Government Departments and the Defence Forces.

(d) The provision of meteorological facilities for civil aircraft operating to and from airports in the Saorstát.

(e) Co-operation with other State meteorological services for the development of meteorological science and of the international meteorological organisations.

Takeover Terms from the UK Meteorological Office

Already, before Austen Nagle's appointment, a meeting concerning the establishment of the Irish Free State Meteorological Service had been arranged for London on Monday December 14, 1936. Details of the items to be discussed were already decided with the Department of Industry and Commerce on September 15 and an agenda was drawn up in informal discussions in Dublin on October 20 between the Departments of Industry and Commerce, External Affairs and Mr Entwistle. It was considered that the transfer would be merely a deferred part of the general transfer that took place in 1922. Mr Entwistle told the meeting that the Met Office (BMO) was practically ready to undertake the meteorological work at the Shannon (Foynes) Airport. No charge would be made for services rendered over and above BMO expenses.

Éamon de Valera, as Minister for External Affairs (he was also President of the Executive Council) wrote to the Secretary of State for Dominions Affairs in London on December 12 requesting 'that as the *Saorstát Éireann* Meteorological Service has now been instituted' formal discussions should take place immediately. As to why Mr de Valera's formal request for the Conference, which had been planned for some months, was dispatched so close to the day remains unclear, unless it was delayed until Austen Nagle's appointment (DO 391/1, National Archives (NA), London).

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The Conference of December 14 was held at the Air Ministry, Savoy Hill House, London. Present were Sir George Simpson, Director of the Meteorological Office, who was in the chair, W.S. Stevens, Air Ministry, C.G.L. Syers, Dominions Office and Mr M. F. Entwistle, Overseas Division, Met Office. On the Irish side were Mr T.J. Flynn, Assistant Secretary, Department of Industry and Commerce, Mr D.P. Shanagher, Principal, Department of Finance and Mr A.H. Nagle, Director of the Meteorological Service.

(a) Agency Agreement

It was agreed at this meeting that, pending full assumption of control by the Free State Meteorological Service, the Meteorological Office in London would provide the staff to operate the meteorological services at the trans-Atlantic air base on behalf of the Meteorological Service on an agency basis, the Irish Free State Government providing accommodation and all necessary equipment. The Irish Meteorological Service would ultimately be responsible for the provision of meteorological facilities at the base. In the meantime, the Air Ministry would submit to the Department of Industry and Commerce, for formal approval, its proposals from time to time with respect to the meteorological organisation at the trans-Atlantic air base.

It was agreed that the Air Ministry would pay their own staff and be refunded by the Free State, including travelling expenses, subsistence allowances, salaries and pension contributions for the broken periods at Foynes. From the date of transfer, the Meteorological Service would assume direct control of the telegraphic reporting stations, climatological stations and rainfall stations in the Irish Free State. Such returns that were required for the preparation of Met Office publications would be forwarded to London until Irish publications were working satisfactorily.

Founding of the Meteorological Service

(b) Network Resources

The Meteorological organisation in the Free State at time of transfer comprised Valentia Observatory (Murphy, IMS-50; O'Sullivan, 1995), manned by official meteorological personnel, 4 telegraphic reporting stations, Birr Castle, Blacksod, Malin Head and Roche's Point, operated part time, 18 climatological stations and 172 rainfall stations (O'Connor, IMS-50). A Memo to Government from the Department of Industry and Commerce in May 1936 differed somewhat stating that the network consisted of 6 regular reporting stations, 166 rainfall stations, 16 climatological stations and 7 gale warning stations.⁶

The only building held by the Air Ministry in the Free State was Valentia Observatory in Cahirciveen, County Kerry. This was transferred free of charge, including technical equipment worth £1,020, non-technical equipment worth £110 and the Scott Library there⁷. Simpson also generously undertook to supply, as far as possible, a complete set of back numbers of relevant publications. The cost of running Valentia Observatory, including salaries, was stated to be £1,920.

(c) Date of Transfer

The date of transfer of the meteorological organisation was fixed at April 1, 1937 but an exception would be made in the case of Valentia Observatory, which would also be operated on an agency basis, until the Irish Free State Meteorological Service was in a position to appoint a Scientific Officer to take charge of the Observatory and pending the

⁶ The only contact BMO had with Gale Warning Stations (probably lighthouses) was to send them warning telegrams (file E75/7/36).

⁷ Robert Henry Scott, D. Sc., F.R.S. 1833-1916, born in Dublin, became Director of the Meteorological Office in 1867. He established seven major Observatories including Valentia. When he died most of his extensive library was given to the British Meteorological Office, which assigned it to Valentia Observatory (Dixon, 1968).

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decision of the local staff there to remain on under the new arrangements. The Air Ministry agreed to facilitate the release of these members.

The staff at Valentia Observatory at that time consisted of a Superintendent (Officer-in-Charge (O.C.)), Capt H. F. Jackson, Technical Officer (on a salary scale ranging from £275 to £680), brothers M.J. and T.J. Morley, Grade II Clerks (on £289 - 16s - 0), G. O'Sullivan and M. O'Shea, both Observer II's (on £181 - 14s - 3d) and Handyman P. O'Sullivan. Regular observations were being made daily at Valentia at 0700, 1300, 1800 and 2100 GMT.⁸ With the exception of Jackson, who was British, the others were all local.

(d) Initial Technical Training

During the transition period it was also agreed that Irish staff would be attached to Foynes for training purposes and that there would be a gradual replacement of Air Ministry staff by Irish staff. The training of technical officer staff would be undertaken by the Air Ministry as there was no suitable university course in Ireland. A comprehensive course was planned, starting at the Imperial College of Science in London at an agreed rate of £1 per week per head while any attendance at the Meteorological Office in London would be free.

(e) Value on Services Rendered

The Irish position before the December 1936 meeting was not to seek directly from the United Kingdom a subvention arising from the provision of meteorological services but that the value of the (aviation) services rendered by the State was to be considered. However, the United Kingdom was already agreed in July 1936 to contribute £6,000 per annum to the Irish Free State Meteorological Service towards the

⁸ BMO 1935/36 Annual Weather Reports

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costs on the basis of these services. In its submission to the Treasury on meeting the cost of meteorological services at the trans-Atlantic Base at Foynes, the Air Ministry argued in favour of an annual contribution of £6,000 to the Irish Free State for recurring (staffing, etc.) expenses, which the Ministry said were valued at £8,000, thus the transfer would save £2,000 to the Air Votes.

Recommending the agreement to the Air Ministry, Sir George Simpson wrote that ‘the Irish Free State were unwilling to take over aviation responsibilities at Foynes at a time when they were not in a position to undertake (these) responsibilities including further development of services involved in such transfer’. There were to be three stages of take over: (1) Irish Free State taking over and carrying on the meteorological aspects; (2) the preparatory (aviation forecasting) experimental stage; and (3) the final period when the Atlantic service was in being. From the Dominions Office point of view, a Mr Self wrote that ‘The tone of the meeting was quite satisfactory’ and ‘that nothing should be done to pin-prick the Irish Free State’, and that the ‘awkward question’ on pension contributions to be resolved later (DO 391/1, NA, London).

Significant dates concerning Transfer of Meteorological Services

Transfer proposed by Irish side:	June 16, 1936
British agreed in principle:	Aug 27, 1936
Agreed items for discussion:	Sept 15, 1936
Preliminary formal discussions in Dublin:	Oct 20, 1936
Conference at Air Ministry, London:	Dec 14, 1936
Network transfer:	Apr 1, 1937
Valentia Observatory transfer:	Oct 1, 1937
Transfer of Shannon (Foynes) Airport:	April 1, 1939*

*Although scheduled for April 1, 1939 in the event control of the meteorological organisation at the Shannon Airport was not assumed until June, 1939 (W.S. 252/2, date not specified).

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Status within the Department

The young service, being directly under a State Department, namely the Department of Industry and Commerce, and equally being a scientific service with international obligations, very quickly found itself in conflict with normal Civil Service practice in regard to official correspondence with other agencies, between Departments and with other services, especially those outside the State. An issue arose concerning the staffing of both Foynes Airport, which was being effected by the British Met Office on an agency basis, and Collinstown Airport.

As part of normal inter-service information, during April 1937 Austen Nagle advised the Director at the Met Office by letter that, in connection with the provision of meteorological facilities for the trans-Atlantic Air Service, as landing facilities would not be available at Rineanna for about 18 months, Collinstown should be used instead and thus trans-Atlantic forecasting should be provided at Collinstown as well as at Foynes. The Department felt that this matter should have been dealt with formally and that semi-official correspondence of this nature with the British Met Office should be confined to details of matters already decided.

In a circular from the Minister, Mr Seán Lemass, dated May 19, 1937, the status of written communications by officials of the Department to other Departments, other bodies or individuals was strictly laid down. This circular restricted the Director of the Meteorological Service to being able to sign letters to the public only. Austen Nagle forwarded a memorandum to the Department on May 26 setting out arguments against the restrictions. He argued that formal procedures applied in a Government Department could not be rigidly adhered to in a Meteorological Service without detriment to the effective discharge of its complete functions. The Meteorological Service was in a unique position within a Government Department in that the Service was responsible for the science of meteorology (similar to say a university) as well as for its day to day application, and that it

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had therefore to function essentially as a scientific institution in addition to being part of a Government Department.

Nagle submitted that the DMS (Director of the Meteorological Service)⁹ should therefore be empowered to deal directly as an official head of the Service with the heads of other technical services, both inside and outside the State in all matters relating to meteorology and with members of the general public co-operating with the State Service or requiring technical assistance. Discussions of highly technical subjects, he argued, can be conducted expeditiously only by direct contact between the responsible technical services. He suggested that only correspondence with other Government Departments as distinct from heads of technical branches within the Departments should be conducted in accordance with the usual procedure and not by the Director of the Meteorological Service.

In the meantime however, and somewhat to Nagle's embarrassment, the Director of the British Met Office wrote to the Department directly on matters concerning staffing proposals by the Met Office at Foynes for the proposed flight season of summer 1937. Nagle raised the matter with Simpson, being in dispute with the Department concerning such correspondence. In his reply Sir George Simpson wrote that as the letter really concerned the way in which they, the British Met Office, were carrying out their obligations to the Government, it was thought that the letter should go directly to the Department with which the Air Ministry had been dealing in such matters. In the event, the Department had already - June 17, 1937 - accepted Nagle's recommendations thus granting the Service greatly increased freedom with regard to correspondence to other agencies and services.

⁹ For the first several decades of the Meteorological Service, the Director was usually addressed as DMS by staff both in conversation and in correspondence.

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First Technical Staff

As early as May, 1937 Nagle was concerned that Jackson's replacement as O.C. Valentia Observatory, was becoming somewhat urgent from the Irish Meteorological Service's point of view and strongly urged the Department to sanction such an appointment. The Observatory was transferred to the Irish Meteorological Service, as planned in the hand-over agreement, on October 1, 1937 at which time Jackson returned to the British Met Office. Subsequently, the remaining staff elected to remain on with the Irish Meteorological Service;¹⁰ Michael (M.J.) Morley became a Junior Met Assistant on June 5, 1940; Tom (T.J.) Morley on March 14, 1941; Gerry O'Sullivan on March 17, 1941; and Michael O'Shea (Miko Shea) on November 28, 1941 (also see Appendix VII).¹¹

Austen Nagle was also concerned with getting suitably qualified staff to help him. At the beginning of 1937 he had a small secretarial staff (including Clerical Officer J. Keegan and typist Una Kinahan) seconded to him by the Department and attached to the Service's first Headquarters in temporary accommodation at Andrew Street, Dublin, a building described by Dixon (IMS-50) as 'having twice suffered bomb explosions, and with sagging floors barely able to support the weight of presses and filing cabinets'. In order to acquire technical staff the Director initiated a number of discreet enquiries through the British Met Office but, as they had only sufficient qualified people to meet their own demands by temporary expedients, he was mindful that he should not develop a practice of stealing staff. The existing staff were of course free to transfer.

¹⁰ With the coming into effect of the new Irish Constitution in December, 1937, instead of *Saorstát* the State became known as Éire, or in translation Ireland. Thus, the Service became known as the Meteorological Service (Éire Meteorological Service in British communications). Informally, the Service was also known as the (Irish) Met Service.

¹¹ Superannuation was agreed at the 1936 London Conference to be apportioned between both Governments. The long delay in assimilating these personnel into the Met Service was facilitated by the British through the agency procedure 'solely to convenience (Free) State' to establish their former service entitlements.

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One of the enquiries which he pursued at that time, concerned the case of a Mr O.B. O'Sullivan, Grade II Clerk at Shaibah, Iraq but eventually this proved fruitless. A second person approached in May 1937 on the recommendation of Sir George Simpson was Mr S.G.G. Kelliher. Stephen Kelliher left his home in County Louth at an early age to join the British Navy, subsequently joining the newly formed Meteorological Service of the Federated Malayan States after World War I, becoming Director. While he could not immediately take up his appointment in the Irish Service, he later joined in August of that same year. Stephen was first assigned the task of extending the network of telegraphic reporting stations throughout the country.

Over the years Stephen Kelliher visited different locations and lighthouses, e.g., Clonmel, Fanad Head, Loop Head, Rosses Point, Tuskar Rock, to see how these places might be established as reporting stations and to survey the local conditions. Many of these stations he felt would best be run on a family basis. Observations of course would be made at certain times both day and night. With reference to Clifden, Co. Galway he recommended that observing duties be confined to the Coast Guard's family only, as 'it would not be possible to have people other than the family going in and out of bedrooms to use the telephone where it had been installed to ensure receiving calls at night for the Life Saving Crew'.

The appointment of Stephen George Gordan Kelliher was agreed to by Executive Council (Government) at Senior Met Assistant level on maximum scale of £350 per annum plus (cost-of-living) bonus but Department should 'try to endeavour to get him at a lower figure'. Meantime however, on October 1, 1937 Stephen Kelliher took charge of Valentia Observatory (Table 4). He was not replaced there for two years but one suspects that he may have continued his interest in finding suitable reporting stations (see Chapter X-Climatological Division).

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C.B. 263
(Sala 41).

COIMISIÚN NA STÁT-SEIRBÍSE

De Dáil go n-ádhuna Coimisiúneirí na Stát-Seirbíse, a ceapadís go fóill
Aic Rialaithe na Stát-Seirbíse, 1924, reirísís cuibhe an 23^ú lú de
Carrae....., 1937., ar dáilíodca an Iarrbóira maroir le h-aoir,
rláinte, cariaécar, eolair agus ábalcaid, agus go maéadair fárcá teo;

Anoir is Deimhín é seo go bfuil an clarrbóir cáilite eun é 'o'porca i
bporc Seirbísíca Seirbísí Meiceaíca, Roinn
Tionncaíl agus Teicnícála (Director of Meteorological
Services, Department of Industry and Commerce).

Agur beid éireadé as an Deimhín go agus tuigsear é beid i bporc an
an 23^ú lú de Carrae..... 1937.....

A tuadad éuar agus ó'n lú ran amad.

Ainm an Iarrbóra Austin Harold Nagle
(Austin Harold Nagle)

Dáca Deiréadair mar a h-innreád | 1^ú, Sarrae, 1937
go na Coimisiúneirí é

Thomas J. O'Connell
Dúine de Coimisiúneirí na Stát-Seirbíse.

Tommy Murphy Rúnair

Dáca an 26^ú lú de feil..... 1937.....

(2128) P.599. W.L.68. D.43/37. 2,000-5-37-F.P.-G.28.

Fig. 2 Civil Service Commissioners confirming, January 23, 1937, Austen Nagle as qualified, on the basis of age, health, character, knowledge and ability, for appointment as Director of the Meteorological Service – issue of Certificates for new entrants to the Civil Service (printed in the Irish language and in the old Gaelic script) was then a statutory requirement. (Copy: Dept. of Transport)

III

The Agency Years

Ireland, because of its unique position on the northwest of Europe and closest point of Europe to Continental North America, had figured as starting point or as landfall point of the early pioneering flights which had taken place during the decades prior to the thirties. The first non-stop flight across the Atlantic took place in 1919 by the British fliers Alcock and Brown who landed at Clifden in County Galway on June 14. The second airplane crossing (as distinct from airship crossings, of which there had already been three) was the sensational flight of Colonel Lindbergh who flew from New York to Paris on May 20/21, 1927.

Because of the more severe meteorological conditions to be expected on a westbound flight, due to the general westerly airflow over the Atlantic, the prevalence of developing depressions off the east coast of North America and Newfoundland and the prevalence of fog near Newfoundland, eastbound flights were likely to prove less hazardous for the pioneer aviators than westbound ones, as the hazards occur near the start of the flight rather than during the critical landfall period. The first successful westbound airplane flight occurred when the German monoplane, "Bremen", took off from Baldonnel Aerodrome, Co. Dublin, for New York on April 12, 1928 and made a forced landing on Greenly Island, Newfoundland on April 13. With Captain Kohl and Baron von Huenfeld, Commandant James Fitzmaurice, of the Irish Air Corps, acted as co-pilot of the aircraft. The success of these flights

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demonstrated that there was a real possibility of establishing a commercial air service across the North Atlantic.

By the nineteen thirties a number of governments were interested in the possibilities of commercial air transportation. The first trans-Atlantic passenger air service was established in 1936 by German airships but flights ceased following the *Hindenburg* catastrophe on landing in the United States in 1937. In 1935, the Irish and British Governments reached an agreement with Canada regarding the promotion of the route to Ottawa, and Imperial Airways was named to undertake survey flights on behalf of the three States concerned. The agreement also provided for the establishment of support requirements of airport facilities as well as radio and meteorological services. Discussions with the United States Government followed and a formula was agreed governing rights.

Foynes chosen as Seaplane Base

With the technical advice of Colonel Lindbergh, surveys were carried out concerning land and sea bases in Ireland along the western regions. Places such as Galway Bay, Lough Foyle, Cork Harbour and the Shannon Estuary were surveyed (O'Sullivan, 1988).¹ At that time also a doubt existed as to the respective merits of the seaplane and land plane and the Shannon estuary offered the possibility of developing facilities for both types of operation. In the event Foynes was chosen as a temporary seaplane base pending the development of Rineanna (in translation 'the Point of the Marsh') as both a land and sea airbase.

¹ Dick O'Sullivan writes that the Irish survey team set up by the Government in October 1935 (of which he was part) had already chosen Rineanna/Foynes as the most likely location of the air bases prior to the visit of Colonel Lindbergh. He goes on to say that 'Wind data for the particular area was not available but, thanks to the Irish Lights Office, wind data taken over many years at the Beeves Rock Lighthouse near the mouth of the Fergus river provided a good basis for planning, pending the results of climatological observations made on the site.'

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Being on the direct air routes to Europe it also had the important advantage of being relatively fog-free and unobstructed by mountains.^{2, 3}

Weather forecasting was an important factor in the trans-Atlantic programme. An efficient Meteorological Service for the collection of weather reports and the preparation of weather forecasts was one of the most vital elements of the ground organisations of the trans-Atlantic route. A special forecasting station had therefore to be established at the Foynes base as well as at Botwood in Newfoundland.

By September, 1936 a radio room was set up in Foynes to copy weather reports from Atlantic ships and surrounding stations – the first experimental messages were sent out on October 28, 1936. Weather broadcasts from Arlington, Paris, Azores and Iceland were intercepted by the new W/T (wireless telegraphy) radio station in nearby Ballygirreen. A 2-way radio transmission service was set up giving the meteorological situation over the Atlantic and a forecast for Botwood, Newfoundland; Foynes was responsible for forecasting and weather services to 30°W.⁴

² According to Dixon (unpublished communication) there was also a climatological station at Coolnavee, Foynes for some years beforehand which indicated apparent freedom from fog. As the observations were made at 9 am there was no indication of the frequent early morning fog in Foynes having dispersed before 9 am.

³ In his memorandum to the Executive Council, April 1936, Minister Seán Lemass referred to the more general parish of Kilconry rather than the townland of Rineanna as the chosen site for the trans-Atlantic airport.

⁴ Foynes Radio had two functions - as a receiving station of meteorological broadcasts and as a guide for aircraft on the final stage of a flight and at take-off. The main radio station at Ballygirreen communicated with aircraft in flight and relayed messages of flight progress mainly between stations covering the Atlantic (Corbett, 1986).

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The First Survey and Proving Flight Season at Foynes

Two stages of development were planned for the first years, i.e. an initial experimental stage followed by irregular seasonal services, and secondly the establishment of a regular flying stage (Corbett, 1986). Thus the meteorological station at Foynes was in operation temporarily for the first time from February 15 to March 5, 1937 when S.P. (Sidney Percival) Peters⁵, J. Harding⁶, S. Proud and Harrower were there in connection with survey trial flights; these included a flight by the Empire Flying Boat *Cambria* from Hythe, Southampton to Foynes under Capt G.J. Powell on February 25 and local operations around Great Britain and Ireland for radio calibration checks. The *Cambria* was one of the two flying-boats destined for experimental flights across the North Atlantic.

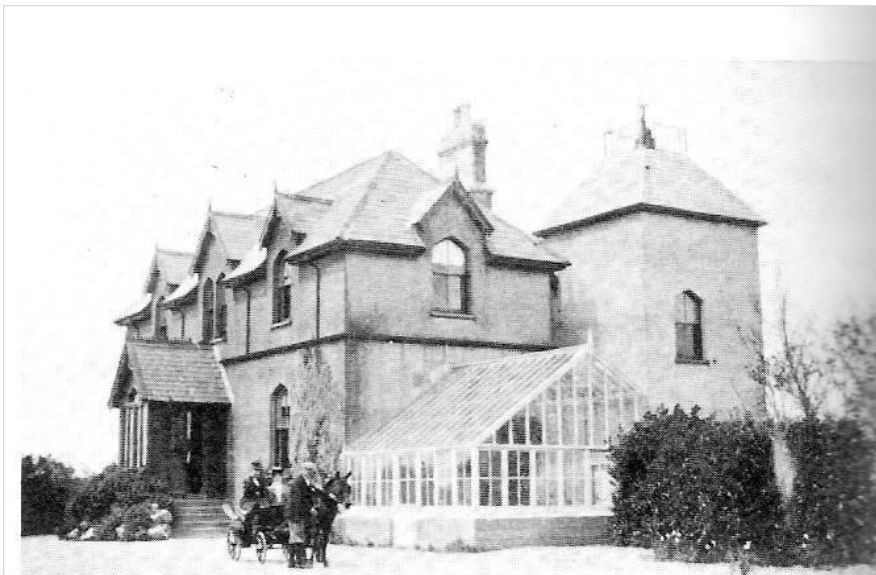
The Met Office (and radio facilities) was located across the square from the railway station in an upstairs room of Walsh's hotel - the Monteagle Arms Hotel. The meteorological instruments⁷ enclosure was situated in a field opposite the hotel, about three minutes' walk from the office where observing and analysis routines were established' (S.P. Peters, undated memoirs).

In preparation for the experimental proving trans-Atlantic crossings which were to take place later that year the meteorological office was again established on a permanent basis on April 14, 1937 with a skeleton staff from the British Met Office; S. P. Peters as Officer-in-Charge, Technical Officers J. Harding and S. Proud, Technical Assistants D.K. Fraser, C.D. Barrow and E.R. Jackman, who arrived

⁵ In 1936 Peters had been in charge of training specially recruited graduates to the British Meteorological Office as forecasters (including F.E Dixon) for the upcoming trans-Atlantic flights, some of whom were later posted to Foynes (Meade, 1986). P.D. McTaggart-Cowan, the then well-known senior forecaster at Botwood, Canada also attended the Croydon course.

⁶ John Harding was Irish and a graduate of Trinity College Dublin.

⁷ The instruments, initially supplied by the BMO, were purchased outright by the Meteorological Service in 1938/39.



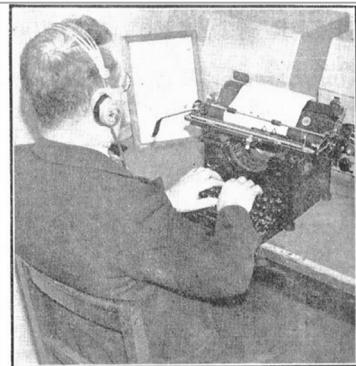
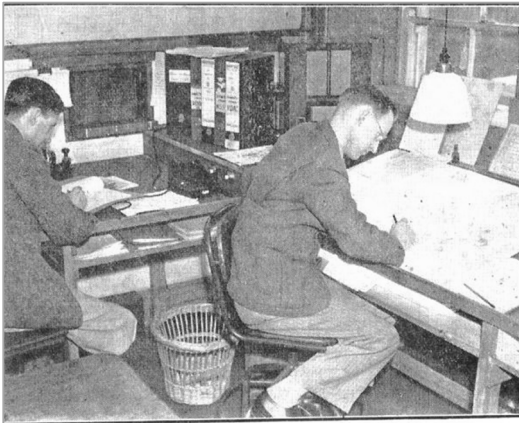
Westwood House, Valentia Observatory in the 1920s (BMO Year Book, 1922; IMS-50)



The 'Bremen' Junkers monoplane at Baldonnell shortly before the historic westbound flight, April 12, 1928



The First Forecasting Office, in the former Monteagle Arms Hotel, Foynes (photo: C.J. Gillman; IMS-50)



PREPARING in the Meteorological Operations Room at Foynes for next week's Yankee Clipper's trans-Atlantic flight to the United States. Above: Receiving a weather report. Left: Compiling weather charts.

Met Office operations room at Foynes preparing for the Yankee Clipper trial flight from Hythe, Southampton in April 1939; Observer R. Jackman? (left), Forecaster S.P. Peters and (right) Communications Officer receiving weather reports (photo: Irish Times, April 8, 1939 ahead of Yankee Clipper's maiden trans-Atlantic flight)

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May 20, and two professional officers from Bermuda, W.G. Harper and N.E. Davis, were assigned subsequently to gain experience of the work. A pilot balloon enclosure and a hydrogen store were erected by the Foynes Harbour Trustees on their property at no charge to the State. The appointment of *Saorstát* assistant staff to Foynes in lieu of the British assistant staff was kept under consideration.

Trial weather data exchange with Botwood began in June 1937 and a regular link was established with Ballygirreen W/T station for relay and exchange of synoptic and forecast reports with the Newfoundland base. As communication between bases and aircraft in flight was in Morse code a radio section was also set up. On July 1 meteorological facilities were reopened for the forthcoming trans-Atlantic trial flights and within a few days a full meteorological organisation on a 24-hour basis was put into operation. On July 5, 1937 trans-Atlantic survey flights by Imperial Airways and Pan American Airways (PAA) took off. Captain Arthur Wilcockson commanded the Short S. 23 C Class flying boat the *Caledonia*, which departed from Foynes at 7.57 pm en route to Botwood, Newfoundland on behalf of the British and Irish Governments. The *Caledonia* flew mostly below 2,000 feet in order to avoid the strong westerly (head) winds at greater heights.

On the following morning Captain Harold Gray and a crew of six from New York and Botwood landed on the Pan American Sikorsky S. 42B *Clipper III* after completing the west to east crossing, flying at 10,000 feet in order to benefit from these same westerly winds.⁸ The times for take-off for both aircraft had been chosen on the basis of the forecast winds, so that both reached their destinations at about the same time, i.e. 10 am.⁹ The respective times were 15 hours 9 minutes and 12 hours 31 minutes. Average ground speed was 139 mph for the *Caledonia* and 162 mph for the *Clipper*.

⁸ In November 1939, Lamb was given the task to investigate wind patterns over the Atlantic for aircraft with an operational flight level of 25,000 feet (see No. 41, Appendix IV).

⁹ Actual touch down time on July 6 was 11.15 am for the *Caledonia* and 10.41 am for the *Clipper* (both Irish time).

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The meteorological arrangements were deemed to have worked satisfactorily except for some difficulties in exchanging messages between Foynes and Botwood. A reception was held for the crew of the *Clipper* at Foynes hosted by The *Taoiseach* Éamon de Valera. Peters had been on duty for 48 hours apart from short breaks (S.P. Peters, undated memoirs).

Weather observations for take-off and landing were made by trained observers aboard the air traffic control launch. Admiralty charts were used to plot aircraft track records (Plate k). However, Peters wrote to Ballygirreen Aeradio (located some few miles north of Rineanna) on an issue relating to position reports relayed by Radio to the Foynes W/T office during the *Caledonia* flight. He complained that all position signals received from the aircraft had not been passed on to the Met Office. Similarly, the Control room was omitted periodically, resulting in a lot of chasing around. In all, 12 signals had not been received in the Meteorological Operations room. 'In view of the obvious importance of immediate attention being directed to all signals from aircraft,' Peters proposed in future that a copy of such signals be relayed to the W/T office, taken down on a specifically designed form and passed on to the other offices. He suggested: 'Owing to the international character of the trans-Atlantic enterprises there would be an advantage in having any printing on it in English instead of Irish.'

McSweeney (1937) wrote in the *Aviation* magazine: 'When "Wilkie" returned to Foynes he paid a very warm tribute to the "met" people and the radio staff. Their names are hardly known to the public, but I think they deserved to be – they made all the difference between the "hit and miss" Atlantic flights of bygone days and a really valuable scientific survey expedition. The cheers in the "met" department go to the Director of the new Free State Meteorological Service, Mr Austen Nagle and the Chief Meteorological Officer of the British Air Ministry, Mr Entwistle, together with the Foynes forecasters Messrs Peters, Proud and Harding.' He also went on to pay tribute to Messrs Gallagher and Connolly of Radio, Tim O'Driscoll, Civil Aviation Section of the

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Department of Industry and Commerce and to Lt Michael Comisky, Army Air Corps, the Control Officer' (Corbett, 1986).

An American Export trans-Atlantic survey flight to Foynes took place on July 15 as did other test flights made on July 27, and again a number of crossings were made by the *Caledonia* and its sister craft, the *Cambria* (Capt G.J. "Taffy" Powell) as well as the *Clipper* during August and September affording experience to both met and radio as well as the air crew. At the end of the flying season the Pan American meteorological representative W. E. P. Wadbrook was withdrawn. In a letter of congratulations, the Secretary of the Department of Industry and Commerce, John (Seán) Leydon wrote to Peters 'it would be difficult to exaggerate the responsibility which rested on your shoulders; ...We are all more than pleased that in the circumstances your labours met with the success they deserved.'

With the cessation of flights in 1937, the professional staff including Peters, soon to be promoted to Senior Technical Officer, was withdrawn on October 15, leaving three assistants, Fraser, Barrow and Jackman at Foynes for the winter.¹⁰ Reduced observation (07, 10, 13, 16 and 18 GMT) and plotting routines were introduced. Occasional requests for forecasts were still received at Foynes to lead Fraser, who was in charge, to write Nagle: 'Baldonnel have been asking me for Cork weather reports the last two days and almost a forecast this morning. I gave them what reports we had and some idea what to expect, which was pretty b---y (sic), and they seem to be satisfied. Is this, however, going to be a regular thing? Without cribbing in any way we have just about as much as we can hold down now, and such interferences are awkward to say the least especially from an official point of view. I do not want to wreck the I.F.S. Air Corps at one go.' Nagle after consultation with the Air Corps agreed the issue of reports be continued with but declining discussion on possible weather changes.

At the end of the year Stanley Proud was re-posted to Foynes on temporary duty to take charge of the station and assist with the training of the Irish personnel expected shortly (in the event not sanctioned by

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the Department for a further year). The radio staff also remained on over the winter and a new 3-receiver W/T reception programme came into operation in February 1938. This resulted in considerable improvement in the number of ship weather reports received from the North Atlantic. Improved facilities were also made available for meteorological purposes, including five rooms, in time for the 1938 flight programme (W.S. 9).

On the experience gained during the 1937 proving flights, Air Conferences were held in Dublin, July 26, 1937 and March 1938 to lay down procedures for trans-Atlantic flights. At the Dublin Conferences were representatives of Ireland, Great Britain, USA and Canada together with representatives of the air companies Pan American and Imperial Airways. On the basis of the experience gained through the survey and experimental flights, meteorological, communications, navigation, control and alerting service procedures were enunciated in a manual of procedures under the title TASSO, the Trans-Atlantic Air Service Safety Organisation (W.S. 252 A and B; Berry, 2005).

¹⁰ Writing to Nagle from Ariel House, London soon after leaving Foynes, Peters complained at being left out of a meeting between the British Met Office and Imperial Airways on a review of the pilot (feedback) reports critical of the meteorological information over western Atlantic supplied by Foynes to the two experimental flights of July 29/30. Peters referred to a colleague quoting F.E. (F. Entwistle, Head of Overseas Division, BMO), 'to the effect that (Peters) was a little over-zealous and so forth, and matters such as this would come out alright in the end if left alone!' He also complained to Nagle that 'F.E. was not disposed to discuss Atlantic matters... I am very small fry and only speak when I am spoken to!' Regarding delay in his promotion he wrote 'There seems to be a lot of hanky panky going on about my promotion. F.E. was very unintelligible about it, and all I could gather were some incoherent remarks to the apparent effect that it had had to be submitted to the Treasury, who were anxious to postpone action. Rather cheering!' (W.S. 12)



Imperial Airways Short S 23 G-ADHM, Caledonia which left Foynes to cross the North Atlantic on July 5, 1937 (photo: Foynes Museum and Archive)



Signed photo by Captain Gray and crew of the Pan American Yankee Clipper after its successful eastbound maiden flight to Foynes July 6, 1937 (photo: courtesy Foynes Museum and Archive)

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Airport Construction Committee

In May 1935 the Department of Industry and Commerce informed the Department of Defence that a twice daily air service between Dublin (Baldonnel) and Liverpool and once weekly return service to London was envisaged. By the end of 1935, it was finally established that Baldonnel Aerodrome would serve as the Dublin terminal at least for some time¹¹ but with the imminent expansion of Civil Aviation, both trans-Atlantic and cross-Channel, the development of a number of airfields in Ireland concurrently became imperative. In order that these developments should be carried out efficiently, a committee was set up within the Civil Service in 1936 to review, monitor and co-ordinate the progress of the works being carried out at the different airports. The principal airports being developed at the time were Collinstown, Foynes and Rineanna.¹²

The Airport Construction Committee had the authority to place contracts and make grants towards the development of specific projects which they approved at each airport, e.g. runway development, terminal building, staff and office accommodation. The Committee mainly consisted of senior representatives of the Department of Industry and Commerce, Mr J. Leydon, the Office of Public Works, Aer Lingus and the Departments of Defence and Finance, the latter represented by Mr D.P. Shanagher. Shanagher had been authorised to sanction any monies that were required for agreed projects on behalf of the Finance

¹¹ Aer Lingus Teoranta was formed in May 1936 and started with civilian aviation services to Bristol (Whitchurch) and Liverpool from Baldonnel (Cronin, 2011, pp. 18/19; Appendix IX, pp151/152). Also, in 1936 the Irish Free State was reported to have had 14 civil aircraft, seven commercial pilots, 34 private pilots and five ground engineers (HMSO, 1937).

¹² The term ‘The Shannon Airport’ collectively referred to Foynes flying boat base and to Rineanna land base. From earliest times it was envisaged that both land and sea operations would transfer to Rineanna as the permanent site. Interestingly, from 1937 through to May 1939 the monthly Meteorological Progress Reports to the Department in a preamble to the item under Shannon Airport consistently noted ‘The Meteorological Office (was) temporarily located at Foynes, ...’ and referred to Rhyanna (sic) as the permanent base.

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Department. Subcommittees were set up by the Committee on specific matters and the Committee could call on the Technical Services to participate. The first meeting of the Committee was held on September 18, 1936.

Austen Nagle served on some of these subcommittees from time to time when they deliberated on meteorological related topics. At the monthly meetings of the Airport Committee routine work reports were submitted for review by each of the Technical Services including the Radio and Meteorological Services. Any changes in the meteorological routine at any of the airports were reported to the Committee, e.g. when an increase in the number of daily observations made at any of the airports was brought into force, or changes in the forecast services provided. Information on the progress on buildings being constructed for meteorological purposes, e.g. anemometer hut, office accommodation, pathways, would be discussed at these meetings.

The development of Dublin Airport was preceding that of Rineanna. Extensive accommodation was set aside on the top two floors of the new terminal building at Dublin Airport for occupation by the Meteorological Service. At one of its meetings, however, the Committee stipulated that this accommodation was to be regarded as accommodation which would be available for the general purposes of the aerodrome if required at a future date. An early estimate for the completion of the Administrative building at Dublin Airport was mid-1939.

Throughout all this time there was no certainty that the Northern Atlantic route would be chosen. Persistent rumours circulated freely that perhaps the southern route to Europe through Lisbon might be used. These rumours mainly arose from the fact that the United Kingdom Government was slow in granting landing rights to Pan American Airways because Imperial Airways were not yet ready to go into regular service. Work went ahead at Collinstown at a fast pace however as land flights were expected to begin from Collinstown early in September 1937. The first stage of development included the laying

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of grass runways - Sir Francis Shelmardine of the Air Ministry in London had requested the availability of a runway, one mile long by four hundred yards wide (it seems a wide grass margin was needed) by October 1, 1937. In the event the runway was ready by October 5 but technical difficulties with the land plane development in Great Britain held up the first flight.

The 1938 Trial Flight Season at Foynes

As already stated the new 3-receiver W/T reception programme resulted in an increase in the amount of ships' reports received at Foynes. The site of the instruments enclosure which had got very boggy was relocated to a new position in the middle of the 'Chapel field'. A Conference on the provision of meteorological services for trans-Atlantic air services was held at the Met office in Toronto at the end of January 1938 as well as the one in Dublin during March. Also, during May 1938, preparations had been made to establish a meteorological station at Rineanna and in November three observations daily 0700, 1300 and 1800 were made there by two members of the Office of Public Works (OPW) who received training at Foynes to study the immediate vicinity of the permanent airport.

In June 1938, the BMO posted D. Arthur Davies¹³ and John Harding, Technical Officers to Foynes and, on July 1, S. P. Peters was appointed O.C. at Met Foynes. The staff position at Foynes at that stage was three technical officers and three assistants. Because of the burden which office routine placed on this limited staff, with duties lasting up to fourteen hours per day, Peters sought additional professional officers and assistants. As the daily observation routine was extended from 0700 to 2030 GMT and with the imminent

¹³ Davies had already shown initiative in that in 1937 he had undertaken three double crossings of the Atlantic in a merchant ship in order to observe and study weather conditions over the ocean (Lamb, 1997).

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establishment of a meteorological station at Rineanna, Peters cautioned Nagle that the duties laid down in the roster ‘may well reduce the staff involved to a state of mental and physical ineffectiveness’ (Meteorological Service W.S./S., ‘Secret’ files).

Two interesting arrivals occurred in July which required special arrangements: the Air France trans-Atlantique flying-boat ‘Lieutenant de Vaisseau Paris’ visited Foynes for trials. Following this visit, Chief Engineer R. Boname, wrote ‘Foynes is very well sheltered, but rather tricky in poor weather conditions’ (Berry, 2005). Later, on July 19, 1938 a Mayo composite aircraft (named after inventor Major Mayo), consisting of two components, ‘Maia’ and ‘Mercury’ operating in a pick-a-back fashion arrived separately commanded by Captains Wilcockson and D.C.T. Bennett respectively (O’Sullivan, 1988). The purpose of the two components was that ‘Mercury’, the seaplane upper component, when taken up by the flying-boat ‘Maia’ to a height of 1,000 ft, and released, could carry fuel sufficient for the Atlantic crossing. The Mercury-Maia airmail flight was planned as the first of three double crossings.

Imperial Airways had also planned two double flights from Southampton to New York via Foynes and Botwood during the autumn. Due to increasing international tensions in Europe, the first ‘Mercury’ flight (July 20) was the only such trans-Atlantic flight through Foynes during 1938 (S.P. Peters, undated memoirs). Following the trials, amendments were proposed to the TASSO (Trans-Atlantic Air Service Safety Organisation) agreed procedures to take into account the proposed longer E-W direction flight journeys to Montreal and New York.

Peters took issue with a perceived criticism by Capt Bennett in his post flight pilot’s report of the weather briefing he received in Foynes. Peters claimed that Bennett had used in his report the preliminary midday weather conference only ‘having presumably mislaid the final one’, which would not have included a chart or did not adhere rigidly to the fixed zones. Peters wrote to Nagle saying: ‘I think Bennett might

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have done the position report code less of an injustice, and spoken more truly, if he had described it as “elaborate and unfamiliar” instead of “rather complicated and cumbersome”. Doubtless it is a lot to expect of one man who is acting as pilot, navigator, engineer and so on, and it was not designed for a one man show...’ (W.S. 252B).

Thus only seven flights, two trans-Atlantic, took place at Foynes during the month of July, and on the whole, the volume of traffic fell short of expectations (only three aircraft visited Foynes during 1938 (Irish Air Letter, 1985)). However, there was a great deal of planning being undertaken with a view to the future and the start of scheduled services. Peters wrote Nagle ‘I am afraid 1938 has not been a very illustrious year from the trans-Atlantic point of view but it seems likely that 1939 will make up for it’. Thus was brought to a conclusion the flying boat trials in preparation for scheduled trans-Atlantic flights in 1939.

Interestingly, the number of ship weather reports received from the North Atlantic north of 50-60°N is given in an analysis made by Peters following the ‘Mercury’ watch, July 18-21, 1938. The number amounted to an average of nine ship reports per standard weather chart or 31 reports per day. This daily number was said to be little different from that received in 1937 (W.S. 252B).

In a semi-official letter to Nagle dated September 27, 1938, confirmed in subsequent days by an official letter from the new Director of BMO, N.K. (Nelson King) Johnson, Entwistle wrote of the necessity to withdraw the whole of the staff at Foynes at short notice in view of a current staffing emergency in Great Britain. The majority of the meteorological staff at Foynes, i.e. Peters, Davies, Harding and Fraser were instructed to proceed immediately to London. Two assistants, Barrow and Jackman, were to remain over winter at Foynes. To allow one of these to take Christmas Leave, Gerry O’Sullivan, observer at Valentia Observatory, was temporarily posted to Foynes for a month beginning December 20, 1938.

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In a wide ranging but forceful reaction to the proposed withdrawals, and thus an effective abrupt termination of the agency arrangements, Nagle wrote an extensive memo to the Department. He argued, among other issues, that the situation arose 'owing to the inadequate preparations made by the Meteorological Office, London, for the expansion now taking place, it was necessary (for BMO) to divert men, originally ear-marked for trans-Atlantic work, to other duties with the consequence that, when Foynes was opened, no staff remained available in England to continue the investigation (into meteorological conditions over the North Atlantic) and the work was, therefore, brought over to Foynes to be continued by the Foynes staff in non-operational periods.' Nagle pointed out that 'since we pay (for staff costs for the operation of Foynes on an agency basis) this has meant that we have borne the major part of the cost (of the investigational work carried out at Foynes) although the British Service gets the credit for the results. For various reasons we have shut our eyes officially to the arrangement...' Following representations by Nagle, Peters was permitted to return and N.N. Wilson replaced Fraser, Jackman and Barrow also remaining in Foynes (Appendix V).

Developments in 1939

Officer recruitment and training, ending of the agency arrangements, transfer of Shannon (Foynes) airport to Irish control and the repercussions of the onset of World War II were major matters of concern for the Meteorological Service in 1939. The year also saw the conclusion of survey flights and the inauguration of scheduled services on the Atlantic. Radio communications were improved with the advent of teletype equipment connected by landline, which speeded up point-to-point transmissions but ground to air communications continued to use Morse code (Corbett, 1986).

A flight from Southampton by the *Yankee Clipper* with U.S. aeronautical observers on board took place on April 11. Operations

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resumed in early summer with a number of flying-boats visiting Foynes including a French craft and the Pan American *Clipper*. In June 1939 Pan Am was ready to start passenger and mail flights across the Atlantic using the northern route and its first eastbound flight, Boeing 314 *Yankee Clipper*, under Capt Harold Gray arrived at Foynes from Botwood on June 28. This was the first scheduled passenger and mail flight of 1939. Two days later the *Clipper* returned to Foynes from Hythe, Southampton on its westward journey. On July 9 the first commercial passenger Pan American flight on a direct route United States to Europe took place. By then ‘meteorologists had gained considerable experience of Atlantic weather, and the meteorological office had developed into a smoothly functioning unit’ (Rohan and Gillman, IMS-50).

Rineanna welcomed its first aircraft from the Air Corps on May 18. On August 30, 1939 Capt. W.J. Keane arranged with Foynes Met Office for the 06 hour and 14 hour weather forecasts to be relayed via the Civic Guard barracks on the airfield but later increased to a three hour forecast by telephone five times daily (O’Malley, 2010; Roche, IMS-50).

Traffic increased during July so that additional moorings were needed as well as additional accommodation for Customs and other State Services. However, as Imperial Airways aircraft were not ready until later that summer, the first Imperial Airways flight, a Short 30 *Caribou* under the command of Capt. Kelly-Rogers arrived from Hythe on the afternoon of August 5, 1939 carrying mail only. The flight was refuelled in the air over Foynes prior to its journey westwards. The mid-air refuelling was a safety exercise; due to the prevailing westerly winds trans-Atlantic flight times for westbound aircraft might exceed 17 hours whereas eastbound flight times were a more modest 10.5 hours. Kelly-Rogers flight returned from Botwood on August 10/11.

In a summary of the meteorological forecasts between Éire and Newfoundland, Imperial Airways described eight return Atlantic trips in 1939. Two things brought operations to a halt – the rapidly falling temperatures in Newfoundland (which caused the harbour at Botwood

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to ice over) and World War II which started on 3 September (Irish Air Letter, 1985). Pan Am's last flight of 1939 arrived in Foynes on October 5 and because of the war in Europe it returned to the States and its passengers and mail were transferred to Imperial Airways.

While the 1939 flights occurred at irregular intervals the number of flights requiring meteorological services at Foynes increased from seven in 1938 to 22 in 1939 (Table 1). On the western side of the Atlantic, P.D. McTaggart-Cowan, Officer-in-Charge, Meteorological Office, Newfoundland Airport, regretting the delay in replying to a previous letter from Nagle, wrote that servicing 'flights had reduced (him) to a state of exhaustion that left little energy for other work' and concluded: 'It has been a great pleasure working with the Foynes Office this summer. There seems to be a degree of understanding of each other's difficulties and shortcomings not always apparent on our other circuits.'

Staff Allowances - Entitlements Hiccup

The transfer of Shannon Airport to the Irish Government was to take place on April 1, 1939. The transfer had the full support of the BMO Director arguing to the Air Ministry and Dominions Office that 'while Éire was appointing its own staff giving them a very thorough training course, it seems clear that no attempt will be made to substitute them prematurely' and that the existing senior met staff would be left in charge.

The service allowance entitlements afforded the British staff caused some misunderstanding to Peters, Davies, Barrow and Jackman. Their salaries continued to be paid from the United Kingdom (reimbursed by the Irish State) but allowances towards accommodation, travel and abnormal hours were to be paid directly by the Irish Department of Industry and Commerce. On foot of this Peters, with his colleagues, submitted a list of allowances which they felt they were entitled to

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under the terms of the transfer and this dismayed the Irish authorities.¹⁴ Following representations from the Irish side, Peters was summoned to the Air Ministry in London on May 2. On his return to Foynes, Peters wrote to the Director of the British Met Office stating that the original (March 29) letter ‘was drafted at a stage when the character of the proposed loan of staff was not clearly understood here (in Foynes), and it is desired to express regret for this misunderstanding... (and that) certain representations made in (his) earlier letter were inappropriate.’ Certain concessions were however made such that Peters could combine visits to HQ in Dublin with visiting his family, and improved payment for abnormal hours (DO 391/1, NA, London).

First Major Recruitment Drive

From the beginning of the new Service the Director, Austen Nagle was anxious to recruit Irish personnel. It was important that the existing stations, which were operated by the British Met Office on an agency basis, should be taken over as early as possible. Equally there was an urgent need to develop the Service in other ways as well, e.g. the expansion of the synoptic station network and the climatological work of the Service. He had hoped that assistant staff would have been recruited for training during the spring of 1937 and that officer cadets would be available late in the autumn. Sanction from the Department of Finance was slow and the provision of Irish staff for operational duties even in 1938 was not possible. Two years were to pass before the first recruits were available.¹⁵

¹⁴ Travel expenses – Peters’ family lived in Bray and Davies’ family lodged in an Inn some eight miles from Foynes. This caused Davies to feel strongly about his domestic difficulties and existence of only primitive and very limited shopping facilities in Foynes needing weekly trips to Limerick. Claims were also submitted for substantial increase in allowance for unsocial hours for Jackman and Barrow. Peters had already been afforded visits to Bray by short stints in HQ.

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Having surveyed the Universities, Austen Nagle thought it likely that at most three candidates of the necessary calibre could be secured from Irish Universities and advised the Department of the need to dispense with the (Irish) nationality requirement.¹⁵

On August 17, 1938 Mr Lemass announced in the *Dáil* that Ireland's youngest Government Service was to play an important part in aviation developments and that the Meteorological Service was seeking six officer cadets, each requiring a two-year training course. He asked the *Dáil* to agree to a sanction of an adjusted sum of £6,000 for staffing for the financial year '38/39 against a vote of £3,500 first authorised. The increase was necessary he stated, owing to the bringing into existence of Foynes and Collinstown Airports. Control of staff, he continued, would be handed over to Irish personnel, trained by the British experts, in preparation for the opening of the North Atlantic Air Mail Service in the spring.

In its submission to Government, the Department of Industry and Commerce argued that 'quite definitely there is no room in the Service for a "misfit"'. Already several applications for Meteorological Officer Cadet¹⁶ had been received by the Civil Service Commissioners. On December 21, further notices appeared in the national newspapers seeking Junior Meteorological Assistants for the purpose of making meteorological observations, chart plotting, instrument maintenance and other duties.¹⁷ The competitive entrance examination was of a very high standard equivalent to Honours Leaving Certificate including Physics and Applied Mathematics.

¹⁵ This may have been an added cause of the delay in completing the Shannon airport transfer arrangements as the transfer was recorded in the June (British) Meteorological Progress Report (also see Chapter II, page 15).

¹⁶ Adoption of the (trainee military officer) term 'Cadet' during the two year probationary period prior to Civil Servant establishment was interesting in view of subsequent proposals, e.g. war time mobile meteorological units attached to army commands and wearing of uniforms (Chapters IV and VIII; Appendix VI).

¹⁷ In the Appropriations Bill, 1939, £20,000 was provided for meteorological services (*Seanad Éireann*, Vol. 23).

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(a) First Cadet Meteorological Officer Course

The first group of five Cadet Meteorological Officers reported for duty on January 16, 1939 at Foynes Meteorological Office. These honours University graduates included P. M. Austin Bourke, former lecturer in Mathematics at University College Cork (and an Irish Chess Champion), Leslie S. Leech, recent graduate of Queens University Belfast, W. Austin Morgan, from Wales, Seán L. (Shane) Tierney, teacher at St. Columb's, Derry and J (Seán) McWilliams, graduate of Maynooth College and secondary school teacher. Paul (P. R.) Brown joined the course on January 26 and on March 3 Fred E. Dixon (Graduate of Cambridge) was the last of the entrants both having experience in the British Met Office, where Dixon had been on a temporary basis since January 1936.¹⁸ The basic salary offered was approximately £200.

Pay scales agreed for Meteorological Officer and senior grades were as follows: Director: £750-900; Deputy Director: £650-750; Senior Met Officer, £500-650 (unmarried, £400-550); Met Officer, £180-500 (£180-400); plus cost-of-living bonus.

As noted previously, Peters had been recalled to London at the end of September 1938, despite strong representations by Nagle to the British Met Office. Nagle's protests bore fruit, however, as Peters was reposted back to Foynes within three weeks. Since his return to Foynes he devoted some time to matters arising out of the proposal of the DMS that a course of training should be held at Foynes, such as the supply of books and other equipment for the course. Unlike the BMO, who operated a standard 6-month course for forecasters, Nagle proposed scientific staff would receive a 2-year course of training.¹⁹

¹⁸ During his training in Croydon under Peters, Dixon from Peterborough, Northampton, was given the previous year's charts to re-analyse with new data from ships logs, determined the geostrophic wind and estimated the flight times between Foynes and Botwood via Great Circle and Rhumb-line at assumed airspeed of 100, 150, 200 kts.

¹⁹ Prior to taking up his appointment, Nagle wrote to Bourke of his intention that recruits would have further training in the Met Institute, Bergen, Norway. Lamb (1997) said Nagle's intention was to send cadets to Massachusetts Institute of

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From January 16, 1939 the Met Officer training course, consisting of training in observing, weather map construction and first principles of forecasting, occupied a large part of the time of Peters and Arthur Davies.

Following theoretical and practical examinations at Foynes the Meteorological Officer Cadet Training Course terminated on April 22, 1939 when the Cadets proceeded to London to the Meteorological Department, Imperial College under Professors Brunt (theory) and Bilham (Climatology).²⁰ Returning again on June 27 for the summer except for Brown and Dixon, they continued their training under Peters and opportunities were provided for them to work on chart analysis in the operations room.²¹ A further development at Foynes in July was the arrival of John Harding (Trinity College Dublin (TCD) graduate who had served in Foynes in 1937) and recruit Hubert H. Lamb (recruited with F.E. Dixon but unable to join then) to take up duty in time for the first passenger flights to operate through Foynes.²²

(b) First Junior Meteorological Assistant Course

The first Junior Assistant course was also planned, beginning on March 28, 1939 with a view to the operation of Foynes on a 24-hour basis. On this course for Assistants were Fergus Hennessy (former teacher), Jackie Staunton, Andrew Roche, John Doherty, Michael Murtagh, Michael J.

Technology, Cambridge, near Boston. No evidence of the latter proposal was found in the files.

²⁰ Brunt's book on *Physical and Dynamical Meteorology*, published in 1934, became a core text for trainee forecasters during the 20th century.

²¹ Surprisingly, their return from Imperial College was reported in the local Foynes and District column of the Limerick Leader, July 8 1939, under the heading 'Return of Meteorological Cadets' (Foynes Flying Boat Museum and Archive).

²² Lamb joined the British Met Office in October 1936. Due to his pacifist principles, in June 1939 he refused to take part as meteorologist in practice exercises in poison gas spraying leading to an official call for his resignation. This was revoked and he was offered secondment to Foynes with possible eventual transfer to the Service in Ireland (Lamb, 1997).

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Keane, Maurice Sheahan, Michael J. Morley, Paddy Howley and Martin O’Herlihy. This group received their basic training in Foynes and the course was terminated on July 7, the written and oral examinations being postponed until October.

The following pay scales were applied to Meteorological Assistant grades: Junior Met Assistant, £80-250 (unmarried £80-180) plus bonus of £12 per child; Senior Met Assistant pay: £250-350 (£180-250). This was the most senior grade to which Junior Met Assistants could aspire (although some ten years later a university sponsorship scheme for Assistants was introduced enabling resultant honours graduates enter the officer grade). The initial pay scale of £80 was very meagre when, as they were advised, full board and lodgings could be had in Foynes from 25/- to 30/- (£1 5s to £1 10s) per week.

While the new recruits were all major achievers at their schools, it seems this did not translate very well to the preparatory training course for Assistants at Foynes. This course was intended to last two months, but in a letter to Assistants in mid-August Nagle warned: ‘I desire that each officer attending the training course should be made aware that I am very dissatisfied with the progress made by the class as a whole. The results of the last test, taken generally, were most disappointing and it is clear that the majority of the class have not applied themselves really seriously to the task of learning their job. The postponement of the remainder of the course now gives each officer an opportunity of revising thoroughly, in his own time, his lecture notes and the prescribed textbooks. Those officers who wished to be retained in the Service would be well advised to take this opportunity. In most cases a considerable improvement upon the standard of knowledge and ability shown at the last test will be necessary to justify the confirmation of the officer in his appointment.

Furthermore, there have been cases of neglect of duty, damage of valuable equipment, failure to report such damage, etc., which indicate general slackness and an irresponsible attitude to the work. A continuation of this state of affairs will not be tolerated. I wish,

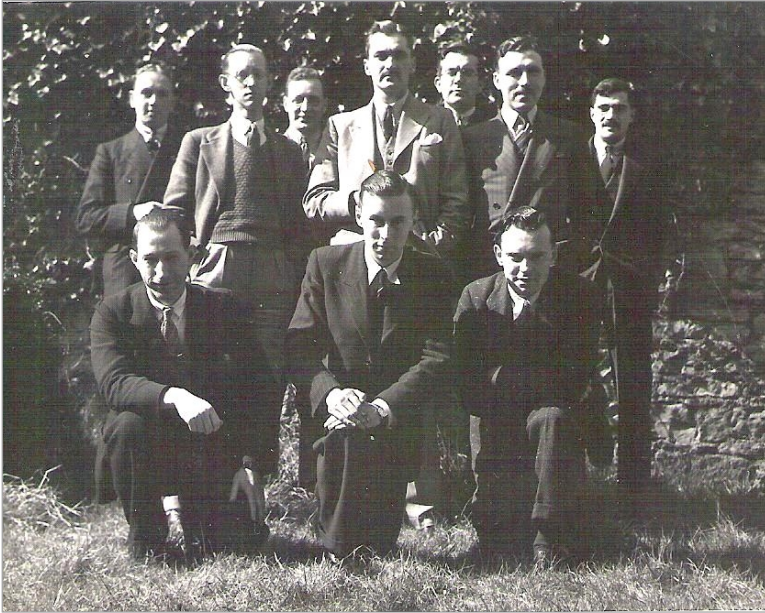
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therefore, to make it quite clear to every Assistant that, unless, by his general behaviour in the office and the way in which he carries out his duties, he shows himself to be keen on his work, alert and efficient, with a proper sense of the responsibilities of the work of a Meteorological Service, he will not be retained in the Service.’

A copy of ‘Meteorology for Aviators’ was issued on loan to each Assistant, and, on the proposed resumption of the course in October, all were expected to be well acquainted with the first 12 chapters of the book, as well as their extensive notes from the course. The October resumption may well have been only a threat to spur the class to continue with their studies, and not seriously planned by the Service.

Upon completion of their training, most of the Assistants were assigned rostered duties at Foynes, enabling hourly weather observations to be extended there on a 24-hour basis for the first time. Fergus Hennessy, Michael Morley, Jackie Staunton and Maurice Sheahan, were posted to Valentia Observatory (Cahirciveen) and hourly synoptic observations were also introduced there on Sept. 3, 1939 (coinciding with the outbreak of WW II). The existing upper air programme at Valentia Observatory, i.e. balloon wind ascents three times daily at 7, 13 and 18 GMT, weather permitting, remained unchanged despite the expressed desire of the British Met Office for (twice) daily upper level wind, temperature and humidity radio soundings. Radio Sonde observations started at Valentia Observatory on September 1943 and then with some assistance towards equipment supply and costs from BMO.²³

²³ This was seen as urgent by the BMO with the start of World War II. A letter dated September 29, 1939 to Nagle stated ‘question of continuing staff loan (was) wrapped up on question on whether you are able to undertake Radio Sonde work’ (i.e. upper air observations) of which yearly costs were estimated at £3,000 for one ascent per day.



*First Meteorological Cadets with Peters, Nagle and Davies, at Foynes, 1939
Front, from left: Arthur Morgan, Paul Brown and Shane Tierney; back, from left:
Seán McWilliams, S.P. Peters, Leslie Leech, Austen Nagle, Austin Bourke, Arthur
Davies and Fred E. Dixon (photo, F.E Dixon; copy Anne McWilliams)*



*Trainee Meteorologists at study at Foynes, 1939
From left: Arthur Morgan!, Shane Tierney, Seán McWilliams (with cigarette) and
extreme right, Austin Bourke! (photo: F.E. Dixon; Foynes Museum)*



Early Meteorologists at Foynes: Leslie Leech, Seán McWilliams, Paul Brown and Shane Tierney (photo: F.E. Dixon; Foynes Museum and Archive)



Staff and Trainee Meteorologists at Valentia Observatory, 1940

From Left (back): Jack Staunton (Observer), Gerry Granville, Barney McNamee, Killian Rohan, Barney Doherty; (front): Gerry O'Sullivan (Observer), Hubert Lamb (Officer-in-Charge), Tom Morley (Senior Observer), Con Gillman (photo: C.J. Gillman; IMS-50)

IV

World War II Arrangements

Impending Developments

The Foynes-Botwood flying-boat connection was poised to become one of the major trunk lines in operation on world air routes prior to outbreak of World War II (de Cogan and Kington, 2001). Imperial Airways (renamed BOAC (British Overseas Airways Corporation) on merger with British Airways, April 1, 1940) had intended three flying boats of the G Class for trans-Atlantic operations; namely *Golden Hind*, *Golden Horn* and *Golden Fleece*.¹ Pan American Airways (PAA) had ordered six more Boeing *Clippers* which would bring their fleet to twelve, and American Export Airlines (AEA) was also seeking a license, using Vought VS 44A flying boats.

With the onset of the flying season July 1939 Peters and Davies were working 16 hour days including alternate night duties. Nagle again sought from the British Met Office two extra Technical Officers (forecasters) and was told that John Harding and Stan Proud were available for return to Foynes. Harding was seconded from Hythe (this seaplane base further upstream the estuary from Poole was used up to 1940) on July 13. Additionally, Lamb proposed arriving July 24, 1939. Matters changed considerably with the onset of WW II as a number of the professional staff were recalled back to Britain. In November 1939 both technical assistants, E R Jackman and Cyril Barrow, remained and

¹ *Golden Hind* and *Golden Horn* did not enter trans-Atlantic service until the summer of 1942 (Appendix IX; Wilson, 2001, 2009).

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applied to join the Irish Meteorological Service as Junior Meteorological Assistants. They later withdrew their applications and returned to Britain in May 1940.

Nevertheless movements through Foynes in the summer of 1939 were disappointing, with little increase on the previous years. A contributory factor was that quite a number of the PAA flights had taken the southern Atlantic route via Bermuda, the Azores and Lisbon.

The imminent outbreak of hostilities in Europe in the early autumn of 1939 changed the scene considerably for Foynes. With the prospect of the British staff being called home, a severe shortage of experienced staff was inevitable. Arthur Davies was the first to leave on August 26 (Appendix V).² The arrangement by which the Met Office Foynes was operated on an agency basis by the British Air Ministry was terminated during the summer and complete control was assumed by the Irish Meteorological Service. Met Office, Dublin Airport was opened on September 13, 1939 and observations including pilot balloon ascents were instituted there in November between 0700 and 1800 hrs daily ahead of the transfer of the Irish terminus for cross-channel flights from Baldonnell Aerodrome to Dublin Airport in January 1940.³ This created further need for additional staff.

In June, a notice seeking Senior Met Officers appeared in the daily newspapers. In August, a notice seeking fifteen Junior Met Assistants appeared and in September eight Met Cadets were sought. As it was not expected that Senior Met Officers would be found in the State, 'refugee' meteorologists were suggested as an outside source (Department Memo to Government, April 20, 1939).

² Davies was assigned to the Royal Air Force.

³ Martin O'Herlihy and Cyril Barrow made these early observations from an Engineers hut full of paint, timber, etc.

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War Time Agreement with the British

Throughout the summer of 1939 one of the more pressing problems facing the Director was the position of the Irish Meteorological Service in the event of an outbreak of hostilities in north-west Europe. Apart from the forecasts issued to trans-Atlantic flights at Foynes, other forecasts such as those to Radio Éireann, to the press and to civil airlines were issued from the British Met Office. These forecasts would be discontinued at war outbreak; Ireland would then be dependent upon Great Britain for the supply of the meteorological data which it must have available for the Irish Defence Forces and such commercial air services that would continue to operate.

Discussions concerning these matters took place in London during April between the British Met Office (BMO) and John Leydon⁴, Secretary of the Department of Industry and Commerce, the Dominions Office being represented by Stephenson and N.E. Archer. Mr Johnson, Director of BMO proposed the continued dissemination of meteorological information on the basis of reciprocity.⁵

At a later inter-Departmental briefing on May 11, 1939, J. P. Walshe, Department of External Affairs, considered that the Taoiseach would probably agree that the continued supply of this information to the United Kingdom Government in war time would not infringe the principle of neutrality and it was agreed that the Taoiseach's specific approval should be sought. It was argued that for 'practical considerations, therefore, that after the outbreak of hostilities Ireland (was) dependent upon Britain for the supply of the meteorological data which the Irish Meteorological Service must have available in the

⁴ John Leydon, unhappy at certain policies of the incoming de Valera Government in 1932, was assured by the new Minister for Industry and Commerce, Seán Lemass, that his views on these policies presented no obstacle. John (also known as Seán) moved to the Supplies Department during war years.

⁵ Nagle advised 'we shall lose much more if we cease to stand well' with the British (January 22, 1940). Department memo advised that there was 'no good reason for discontinuing the practice of supply weather information to the British Office in London'.

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interests of the Irish Defence Forces.’ Weather reports from the five Irish synoptic stations would be of great value to any belligerent in northwest Europe particularly for the purposes of attack on Great Britain. The withholding of Irish weather reports from the United Kingdom would place British interests at a disadvantage.

17 copies of a memorandum on the meteorological organisation in the event of hostilities in Europe were circulated to a Government meeting. The Cabinet decided on August 25 that the present practice of supplying meteorological reports to the BMO in London should be continued provisionally. A memorandum along these lines was forwarded to the United Kingdom Authorities by the Department of Industry and Commerce. (W.S./S. 58)

A further meeting was held in London on September 1, 1939. British arrangements regarding meteorological information in time of war were being introduced on that date. Mr E. Gold, Assistant Director and Mr F. Entwistle, Overseas Division of BMO, attended on the British side and Ireland was represented by John Leydon; Nagle was at a Meteorological Conference in the US at that time.⁶ It was agreed that the British Met Office would continue to supply meteorological information required for official purposes to the Director of the Irish Meteorological Service. The Confidential Met Code had already been dispatched to the Office of the High Commissioner for Ireland on August 22, 1939. This was handed over to Leydon who personally conveyed it to Foyne and handed it to Peters (see Chapter VI; also Appendix I). It was also proposed that a Harrow aircraft would be based at Shannon for the purpose of making weather survey flights some 500 miles into the North Atlantic.

While the new Met Code was easily assimilated by meteorological personnel, other users, such as company pilots and company ground representatives proved at first not to be so easily adaptable. Leydon received a letter from Gold on September 21 complaining that Pan

⁶ For a subsequent meeting with Johnson in London in May 1940, Nagle enquired of the Department should he ‘register as a UK or as an Irish national’.

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American and Imperial Airways aircraft were still transmitting position and weather reports in the code adopted by the Dublin Conference on trans-Atlantic practices held in March 1939. Nagle considered that, as the current flying season was coming to an end, the anomalies would quickly cease altogether.

A request from the Netherlands for Irish climatological data was refused in February 1940 by the Department of Industry and Commerce on the grounds that the 'policy to be adopted must be based primarily upon the necessity of avoiding prejudice of the especially close collaboration between the Irish Meteorological Service and the British and Canadian services, which exists at present and which is essential to the Irish Service not only for trans-Atlantic purposes but also for the met protection of Irish civil and military aircraft.'⁷

Arrangements with the Defence Forces – Air Defence

The issue of daily forecasts to the Air Corps for flights on the route Baldonnel to Rineanna, and to cover long cross country and coastal reconnaissance flights made as normal training, commenced in August 1937. Also, meteorological observations during daylight hours were undertaken at Baldonnel Aerodrome by Air Corps personnel.

(a) Gearing up for Impending Hostilities

In June, 1939 major discussions took place with the Defence Forces concerning the meteorological organisation in the event of hostilities in Europe. The discussions were concerned with the supply of 'Meteor' reports to Coastal Defence Units, cooperation with GHQ, Naval Units and the Coast Watching Service. An officer of the Coast Watching Service subsequently attended a short course on weather observations at the Met Office Foynes; it was envisaged that he in turn would train personnel at the coastal watching stations to supply local weather reports. The Director of the Meteorological Service was very

⁷ During the war no meteorological data was to be published prior to the 15-day rule and there was to be no reference in the press as to activities of the Met Service.

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enthusiastic about the project but, in the event, regular observations were never made at these locations.

In August 1939 a 24-hour forecast service became available to Baldonnel, given ample warning of the flight arrangements. A debriefing system was concurrently instituted whereby a priority telegram was sent to Foynes whenever the forecast proved to be inaccurate; otherwise when the forecast was deemed to be accurate, the flight debriefing was to be sent by normal postal services. Instances of ice were to be reported in particular. 'Energetic cooperation' by pilots with the Meteorological Service was encouraged. As weather reports were not yet made for Rineanna, reports from Foynes were to be inspected instead. This forecast service to the Air Corps at Baldonnel and Rineanna was expanded in October 1939.

(b) Major Conference on Air Corps needs

At the request of Department of Defence, a Conference on the meteorological requirements of the Air Corps was held at Baldonnel Aerodrome on October 13, 1939. Present from the Air Corps were: Col. P.A. Mulcahy, O.C., Capt W.J. Keane O.C. R & MB Squadron and Capt M. Sherin, O.C. Fighter Squadron. Mr R.W. O'Sullivan, Aeronautical Engineer, represented the Department of Defence. Mr A.H. Nagle, Director, and Mr S.P. Peters, O.C. Foynes Met Office⁸, represented the Meteorological Service. The objective was to place the meteorological arrangements for the Air Corps⁹ and Air Defence Command on a more permanent and efficient basis arising from the more intensive training and the more extensive operations undertaken. Matters discussed were: (i) provision of met information for the Air Corps, (ii) training of Air Corps personnel in meteorology, and (iii) establishment of met offices at Baldonnel, Rineanna and Fermoy Aerodromes for direct consultation by pilots.

⁸ Peters, as O.C. Foynes, operated a tough regime and had an distant relationship with his (junior) staff according to Ultan Egan, 1940 JMA entrant.

⁹ The Air Corps had about 50 operating aircraft and had taken over Rineanna airport.

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(c) Agreed New Services with the Air Corps

In order to assist the Meteorological Service in providing a service to the Air Corps, it was agreed that: (i) routine weather reports should continue to be sent to Foynes; (ii) reports by pilots on each forecast should be made as heretofore; and (iii) upper air observations should be made by Baldonnel aircraft whenever possible.

The routine daily flight forecasts from Met Office Foynes to both Rineanna and Baldonnel were to be sent by priority telephone and telegram - a detachment of four Ansons and two Walrus Amphibians had begun patrols around the south and west coasts from Rineanna (Roche, IMS-50). Commencing October 16, 1939, Air Corps, Baldonnel agreed to make upper air observations of temperatures, cloud and icing at 10 am approximately whenever possible, the results to be sent to Foynes. An aircraft of theirs would also observe upper level temperatures daily at one o'clock. The Meteorological Service proposed that a skeleton organisation might be possible at Rineanna by the summer of 1940. In the meantime, arrangements were made to provide the Air Corps with some additional assistance by way of an increased number of forecasts, especially to Rineanna, and the issue of barrage balloon warnings.

Meteorological training was seen as important input to first and advanced courses for officer Cadets, and for the General Reconnaissance and Navigation courses. The Meteorological Service agreed that a training officer would attend Baldonnel daily to give a series of 1-hour lectures commencing October 30 and that an examination would be held in December. The Met Officer giving the course was to provide advice to the Officer commanding the Air Corps in the teaching of the more elementary training sections. Temporary emergency accommodation for Met staff posted to Baldonnel was to be provided.

Following the discussions with the Defence Forces, the Meteorological Service set about providing the agreed new services to the Air Corps. Also, an officer of the Meteorological Service, Hubert

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Lamb, was assigned to lecturing to the Air Corps on meteorology and on October 30, 1939 commenced the course of ten 1-hr lectures to Officer Cadets then undergoing a course of instruction at Baldonnel. Upon completion of this course in December, Lamb examined the Cadets in Meteorology.¹⁰ The new routine procedures for the supply of weather forecasts and warnings to Air Corps, Baldonnel and Rineanna, by Met Office Foynes were instituted on December 18, 1939. An increase in the weather observations at Baldonnel was also put into effect, i.e. weather reports at 0500 and 0600 GMT daily for use in the early morning forecasts.

(d) Mobile Meteorological Units

Collinstown was thought to be a dangerous locality for the installation of the Meteorological Service Headquarters with its teleprinter and forecast centre. As the Service would almost entirely be concerned with military work for the duration of the emergency, its main centre should be close to Army GHQ which was temporarily at the Department of Defence. In case of active operations in the field, the entire Service would be placed on an improvised mobile basis. Teleprinters and forecasting Centre would accompany field GHQ while outlying detachments would maintain communication with Local Military Posts and Field Units. In the event of a serious situation arising involving the

¹⁰ Heretofore, training of Air Corps personnel in making weather observations was given by the Chaplain to the Air Corps, Fr W.M. (Bill) O’Riordan. Fr Bill acted as weather observer there from 1933 and as instructor on the theory of meteorology to trainee pilots and, although a mathematician, ‘he considered himself incompetent to give practical instruction’. From the 1920s it was to Fr Bill that the Air Corps turned in matters relating to meteorology, including their response to the 1928 International Commission for Air Navigation’s request for details of the meteorological and other services available in the Irish Free State being ‘the only person at the station who had an appreciation and knowledge of meteorology and was recognised as the Air Corps’ authority on the subject until 1936’ (O’Malley, 2010). Fr Bill reminded his superiors in written submissions over the years on the inadequacy of existing arrangements. His impatience at the lack of progress led to his being side-lined after October 1935, although he continued to lecture as needed.

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evacuation of existing meteorological installations, meteorological personnel would report as arranged to permanent or field units.

As the Meteorological Service would be responsible for advising military authorities as to the ultimate dispersal of meteorological personnel, Austen Nagle, subsequent to the 1939 conference with the Air Corps, set about devising a scheme of organisation in preparation for a possible time of active war in Ireland. He envisaged the formation of a number of Mobile Meteorological Units to be attached to various military units, manned by the then existing staff. The Mobile Unit attached to GHQ would act as a collection and distribution centre of weather information. Three types of units were envisaged, namely, Mobile Forecasting Units (MFU) attached to all Commands and to Baldonnel, Mobile Meteor Units (MMU) attached to Military Centres and Mobile Observing Units (MOU) attached to Military Units. It was expected that there would exist some nineteen units in all.¹¹

Examples of staffing arrangements would provide 12 at the MFU at GHQ (Baldonnel and Rineanna) which included Peters, Doporto, Granville and Rohan, Clerical Officers Lawlor and Geoghegan and six assistants; Dixon and Lambert were to be attached to Dublin Anti-Aircraft Centre (MMU); Tierney and O'Herlihy at Fort Dunree (Buncrana) MMU; Howley at Longford MOU. At the outbreak of hostilities Foynes and Valentia Observatory staff were to report to selected Military Units who would convey them to their allotted war station. Weather reports would be transmitted in cipher from all observing points to GHQ.

In the event of an invasion, plans were put in place in 1940 for the destruction of all records and equipment at Foynes Met station under the supervision of Doporto and Peters. Three warning signals were to be given. Stocks of spare parts and certain other items had already been removed from the station.

¹¹ This paralleled similar emergency decentralisation arrangements in Governmental Departments (E75/7/36, National Archives).

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In an internal memo dated March 1941, the Assistant Chief of Staff expressed no great enthusiasm for bringing the Meteorological Service under the control of the Defence Forces.

(e) Other Co-operation with Defence Forces

Co-operation with the Defence Forces also included research into the relative advantages/disadvantages, from a meteorological aspect, of various and different approaches to Ireland if invading by sea or by air. This research extended over fourteen months and because of staff shortages tabulations and assessments were issued separately before the start of each month. The research was based on five years data at Irish stations and dealt with: (i) difficulty of passage - the chances of a good passage, e.g. likelihood of gales, fog; (ii) effectiveness of air reconnaissance - chances of cover along route, e.g. cloud, fog, heavy rain; and (iii) landing - chances of good landing.

The Meteorological Service also co-operated with the Department of Defence in the publication of a booklet designed to help military personnel identify aircraft in the air and estimate their height. Fred Dixon, a keen photographer, was readily able to supply photographs of all the identifiable clouds which were included in the booklet to help estimate the height of the aircraft.

(f) Later Developments

A further conference was held in June 1940 on the utilisation of the Meteorological Service, this time to extend further the Meteorological Service's co-operation with the Defence Forces to the Anti-aircraft Artillery, Coast Artillery, Marine Service and General Staff Command HQ. It was estimated that in 1940 some 90 forecasts per day were being issued to various branches of the Defence Forces. For example, the Marine Service was to be provided with a 24-hr forecast of conditions for the entire coast line whereas from September 1940 Commands were to be issued forecasts by Met Foynes at 0630 GMT for the daytime and dusk and at 1330 GMT for the night and dawn. From March 1941,

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routine meteor (meteorological) reports were supplied at two hour intervals during daytime by Foynes Met Office to Air Defence.

The question of accommodation and establishment of a Met Office in Baldonnell was also raised and was followed up immediately by a letter to the Defence Forces from T.J. Flynn, Secretary, Industry and Commerce saying that it 'will be possible to post trained meteorological personnel to Baldonnell in about October next (1940)'. In a follow up enquiry from Nagle in November 1940, no record of receipt of the letter could be found (EDP/30). Apparently, staffing by four Met Assistant posts were sanctioned by the Department of Finance for Baldonnell and draft duty schedules were drawn up including pilot balloon ascents at 0700, 1300 and 1800 daily; these posts were never filled (also, see O'Malley, 2010)¹³. Weather observations, during daylight hours only, were made by Air Corps personnel from 1941.

(g) Met Requirements of British Forces in Ireland

In July 1940 Squadron Leader A.L. Maidens, Chief of the Meteorological Office in Northern Ireland sought permission to visit here to ascertain Southern Ireland's arrangements as regards the supply of meteorological information to the military and air forces of Éire. The knowledge was necessary, he argued, to enable them to link the Northern Ireland organisation with that of the southern services. While a certain number of observations from reporting stations in Éire were being obtained, many more observations of a special character and from additional places, he understood, were not distributed. Also, there was a need for establishing what channels of communication would be

¹² At one stage wind/ballistic surveys were made after a proposal by the military (stationed there in 1940) to place an artillery gun in Valentia Observatory to protect the estuary. Nothing came of it (personal comm. Joe Graham).

¹³ O'Malley (2010) writes that, in reply to the Air Corps request, the Minister for Industry and Commerce indicated that the Minister for Finance, as far back as 1939, had granted approval for the recruitment of one meteorological officer and four assistant officers for Baldonnell. The author added that ... 'the Dept of Industry and Commerce appears to have been remiss in not pursuing the recruitment of the personnel authorised (both) in 1939 and again in 1945'.

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required in the event of ‘our (UK) forces having to come to the assistance of Éire to repel a German invasion’. This needed direct talks.

A telegram was sent to Maidens by his military superiors instructing him (for political reasons) not to attempt to obtain any information regarding the Éire meteorological arrangements except through his own Directorate. Later, in August he was granted permission to visit Dublin but should ‘go in mufti not in uniform’¹⁴ and would report to Mr Lywood, United Kingdom Representative in Dublin. After his Dublin visit he reported back ‘regretting the lack of agreement by Department of External Affairs to have direct talks with the Meteorological Service’. Replies would only be supplied by means of a questionnaire, which he submitted in October. (AIR 2/5192, NA, London). The data presented over were extracted from information supplied to the British by the Irish authorities. (AIR 40/1217)

(h) North Atlantic Safety Organisation

Owing to restrictions imposed by the war in the North Atlantic area, amendments had to be made in the safety organisation for trans-Atlantic flights. These amendments were framed at a meeting, held in Dublin, in July 1940, attended by representatives of the United Kingdom Met office, Air Ministry, Canada and Irish meteorological and technical representatives.

Advances in Communications

Weather reports from Irish stations were sent by either telegraph or by telegram to Foynes and repeated to the British Met Office in London. Reports from London to Foynes were received by telegram in Confidential Met Code. This method being unsatisfactory, in 1940 sanction was received for the installation of a teleprinter communications system between Dublin and Britain and between

¹⁴ O’Malley (2010) recounts how other British military personnel, visiting the Air Corps, were directed to wear plain clothes.

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Dublin and Foynes. The system was first tested in May 1940 from the Central Telegraph Office (CTO) in Dublin to the Met Centre at Dunstable in England. Initially, the meteorological communications centre was intended to be installed in the new Headquarters (44 Upper O'Connell St.), but finally, however, Dublin Airport was selected as the communications centre. Thus, hourly observations from the synoptic stations were phoned to Dublin Airport instead of Foynes from December 1, 1941. According to Kavanagh (IMS-50), an instructor and Radio Officer at Dublin Airport, 1941-'45, 'hourly reports were received from Malin Head Radio, Belmullet (Blacksod!), Valentia Radio, and Whitegate (Cork). These came from the GPO by telegram. Reports over

Éire Aerodromes and principal landing Grounds and their Defence Measures June 2, 1940*

Aerodrome	Runways No./type	Dimensions yards	Other Characteristics
Rineanna	4 grass	1750 x 200; 1717 x 400 1760 x 200; 1783 x 200	Civil Aerodrome; also in army/Air Corps use
Foynes	Shannon Estuary	runs of 2 miles in all directions available 2 large moorings	W/T, R/T, D/F
Rineanna	Estuary of rivers Shannon and Fergus	runs of 2 miles in all directions	
Collinstown	4 grass	1760 x 400; (3)1000 x 200	
Baldonnel		No laid out runways greater than 1000 yds	
Fermoy/Gormanstown		“	

* 'Measures have been or are been taken (by *Éire*) to render the following aerodromes useless either in whole or in part (in the event of invasion)': Baldonnel, Collinstown, Shannon (Rineanna) (AIR 40/1217).

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the Morse circuit were supplied by Foynes. All these reports were then put into code and transmitted by teleprinter to the United Kingdom communications centre at Dunstable.’

The Met Office at Dublin Airport took responsibility for the meteorological protection of civil aircraft using Dublin Airport and also took responsibility for the issue of forecasts to Baldonnel and to Fermoy. On January 30, 1942, the Department of Defence agreed to make available at Baldonnel Aerodrome accommodation sufficient for housing a teleprinter and a skeleton organisation although this had not been provided for in the new building there. A suitable site could be provided later for a meteorological office whenever required.

Electricity Supply Board (ESB)

On May 16, 1940 the ESB wrote to the Service requesting routine forecasts. Some years prior to this, they received some service direct from London concerning wet and dry spells, thunderstorms and snow conditions, but this channel of information had ceased. At the time of this request a general rule was being followed in the Irish Meteorological Service that meteorological information should not be supplied to any non-governmental organisation during the then existing emergency.

Because of the ESB's national importance to the economy, it was decided to make an exception. However, the information supplied was to be treated as strictly confidential and confined to a very small number of personnel in the relevant section of the ESB operating the system.

It was important that not only was the information furnished to be kept secret but that only a minimum number of persons would be aware

¹⁵ The general introduction of the teleprinter for point to point communications eliminated the need to use Morse code to send meteorological reports by radio, but such landline connections only took place gradually.

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of the existence of the particular channel of supply. A messenger from the ESB collected the weather message daily at Met Headquarters. On one occasion in August 1942, the report was lost in transit, the messenger being later reprimanded for his negligence.

An unusual feature of the weather warnings issued to the ESB was the form of code used. These warnings were referred to as Thermal Warnings, covering such expected events as gale force winds, thunderstorms or heavy rain.

Another unusual part of this service was the issue of Thermal Drifts notifying the ESB of conditions suitable for the drift of barrage balloons in over land. The barrage balloons, with their trailing cables, were released by the belligerents to disrupt power supplies by entangling with the electricity lines and often got embedded in an easterly airstream blowing towards Ireland. Widespread disruption of electricity was caused in the United Kingdom during February 1941 when barrage balloons drifted across England with the easterly gale on February 16 bringing down power lines.¹⁶

¹⁶ Four barrage balloons were noted over Irish territory and three were shot down by the Air Corps: one near Foynes, October 1939; another off Waterford coast, June 1940; and a third near Carlow, May 1941 (O'Malley, 2010).

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Fig. 3 Irish Meteorological Reporting Stations, 1943

(Northern Ireland shown for completeness; see Fig. 4)

- Synoptic Stations ● Limited Reporting Stations
- ⬡ Claremorris, Mullingar and Clones opened in 1943 (Clones was closed again in 1944; Middleton opened in 1946).
- ⊙ Occasional Reports from Lighthouses were received on request (see for instance p.19)

Recruitment in the Early War Years

Post Agency Arrangements

With the outbreak of hostilities in Europe it became urgent both from the Irish and British Government points of view that the operation of Foynes on an agency basis by British personnel, who were urgently required at home, should be terminated as soon as was practicable. The young Irish cadets had only some seven months training in what had been envisaged as a two-year training course. Despite the outbreak of war and President Roosevelt's announcement of restrictions, flight operations at Foynes were expected to expand. The Irish Meteorological Service was therefore anxious to recruit experienced personnel.

John Harding (see previous references) and H.H. Lamb¹ (later to become a noted Climatologist) had arrived in July 1939, and Ignatius Lambert, Scientific Research Assistant also came to Foynes during the summer of 1939². Arthur Davies³ however returned to Britain towards

¹ In June 1940, Lamb was formally transferred to the Irish Meteorological Service. As reference for the post, BMO Director, Sir N.K. Johnson, stated 'in ability, zeal and personality Lamb showed himself above the average of his contemporaries, and his conduct left nothing to be desired.' Lamb was put in charge of teaching the first Irish graduate and assistant courses held at Valentia Observatory.

² A specially created post sanctioned on March 2, 1940 (see Appendix VI).

³ Arthur Davies, subsequently Director of the British East African Territories and Indian Ocean Islands, became Secretary General of the World Meteorological Organization in 1955 while Austen Nagle retired from the Irish Service in 1948 to

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the end of August to be attached to the Royal Air Force and John Harding, on temporary transfer to Dublin Airport, finally departed in December. In the meantime Drs Doporto and Pollak had joined the Service. Upcoming recruitment drives both for meteorologists and Assistants were sanctioned.

The troubles in Europe also placed new stresses on the Meteorological Service. A revised scheme for the issue of forecasts to the Air Corps came into operation at Foynes. The first flights from Dublin Airport in the autumn required temporary transfers from Foynes of Messrs Barrow, Harding, Peters and others. On the transfer of the Irish terminus for cross Channel Civil Air Services from Baldonnell Aerodrome to Dublin Airport, January 18, 1940, Met Office Dublin Airport assumed responsibility for the meteorological arrangements at the Irish terminus of the route formerly discharged at Baldonnell by Control Office Personnel. On the transfer of some Junior Met Assistants to Dublin Airport, mid-February 1940, an extension of the daily hours of observations was put into effect for the period from 0600 to 1800 GMT. Practice forecasts for the route Dublin to Liverpool were also made.

Issue of non-Nationals

Subsequent to a newspaper advertisement for senior officers Dr Leo W. Pollak was appointed in that grade on October 30, 1939 and Dr Mariano Doporto was appointed on November 21, 1939.

Dr Doporto arrived at Foynes on November 23 and Dr Pollak arrived there from Headquarters on December 7. Dr Pollak, together with the O.C., S.P. Peters, commenced a lecture course with the first

join the US Weather Bureau at a senior level; it was said that he did this in anticipation of American support for the same WMO post! Nagle's candidacy survived to the final run-off vote (O'Connor, IMS-50).

Recruitment in the Early War Years

group of cadets while Dr Doporto was assigned to help with forecasting and research on the problem of upper level winds over the Atlantic.

The European war situation placed new obligations on the Meteorological Service with many attendant problems for Nagle. On the one hand, the President of the United States defined a combat area for Europe on December 21, which included Ireland, making it unlawful for citizens or vessels of the United States to enter. Another matter that was of urgent concern to Nagle was the regularising of non-nationals so that some of his most experienced staff, chiefly Peters, could be retained until Irish staff had sufficient experience. The then Director of the British Met Office, Mr N.K. Johnson, had already informed him on September 4, the day after war was declared by Great Britain on Germany, that Peters would be recalled. Later on a visit to Dublin, Mr J.M. Stagg⁴ confirmed that the British had very definite plans for recalling Mr Peters immediately if a critical situation developed there.

The issue of the nationalisation of non-nationals to entice staff to remain also related to the position of Doporto and Pollak. This matter was pursued with some success by Nagle with the Departments of Defence and External Affairs. Mariano Doporto, who was Spanish and married with three children, held a passport issued by the former Basque Government which expired January 1940, and subsequently held a Certificate of Identity issued by the Minister for Justice. Dr Leo Wenzel Pollak married with no children, held a Czech passport which was still valid.⁵

⁴ J.M. Stagg was attached to the BMO Management of weather services for the British army; for further references to Stagg, see Appendix III on Blacksod weather reports and D-Day, June 6, 1944.

⁵ Pollak (very formal), a Professor at the Geophysical Institute, Prague, became a refugee in London; Doporto, a Basque (sparkled with fun) got caught up in the Spanish civil war on the republican side and escaped to France (Photo Plate 1, Appendix XI; also IMS-50; Lamb, 1997; Peters, undated).

Establishment of the Meteorological Service in Ireland

Nagle argued that by virtue of their experience and abilities - meteorologists of international repute with long and varied experience of meteorological work - they were essentially 'key men' in the Service which had important functions associated with the defence of the country but which, at that stage of its development, had only a very limited number of experienced staff. Out of a total staff of 65 (July 1940), 'only three other officers can be regarded as sufficiently experienced to deal with emergency conditions, one of which is a British Officer on loan'. There was he said the question of an implied understanding that they would be offered citizenship when both were appointed. Both families were later granted citizenship of Ireland and the Irish Meteorological Service was to benefit from their services for many years; they would have had to move to the United States in their own interests if this citizenship had not been granted (Appendix XI).

On July 6, 1940 Dr Doporto was made responsible with Peters for the emergency arrangements at Foynes.

While Peters' transfer back to the BMO had been successfully delayed after the outbreak of the war, again there were renewed demands for him to return to Britain towards the end of 1940. Austen Nagle pressed the Department very strongly that, in order to entice Peters to remain here, the Irish Authorities should offer Peters the post of Assistant Director on his transfer to the Irish Meteorological Service. The value of Peters as an experienced forecaster and as a training officer was impressed on them by Nagle who wrote 'The satisfactory reputation which Foynes Met Office has built up is due entirely to Mr Peters' experience, influence and ability... and his return will deprive our men of his unique experience, practically all gained at Foynes.'

Nagle also contacted others, e.g. the Defence Forces, to enlist their support on the necessity to retain Peters.⁶ The Dominions Office in

⁶ Following Nagle's phone call, an internal memo to Senior Command of the Defence Forces, while accepting Peters' retention may be 'vital' to the Met Service, doubted if his leaving would lead to its collapse!



Valentia Observatory Training Course for Assistants, 1940.

Back row: Jimmy McNamara, Dick Matthews, Dermot Keane, Brendan Smith, Joe Graham, Michael Walshe, Paddy Butler, Des O'Connor. Front row: Tommy Reynolds, Joe Hardy, Tommy Keenan, J.D. (Maxi) Kelly, Maurice Keane, Dermot (J) O'Connor, Ultan Egan (Maurice Keane, copy, courtesy Paud O'Mahoney)



Meteorological Service Headquarters – Left: 14/15 Andrew St. Dublin 2, 1936-'41 and Right: 44 Upper O'Connell St. Dublin 1, 1941-'79 (Photo: author, 2011)



Meteorological personnel at the monument near the Met Office, Foynes, 1939.

From left: Shane Tierney, John Doherty, Martin O'Herlihy, Cecil Barrow?, Austin Bourke, Paul Brown, Jack Staunton, Seán McWilliams and Leslie Leech (Photo: F.E. Dixon, 1939; IMS-50)



Imperial Airways flight, a Short 30 Caribou under the command of Irish man Capt. Kelly Rogers arrived from Hythe near Southampton on the afternoon of August 5, 1939 (photo courtesy: Foynes Museum and Archive)

Recruitment in the Early War Years

London wrote to BMO Director Johnson asking him to give it his sympathetic support adding ‘to have in the Éire service a man who was formerly in your service will also give you a useful contact who will appreciate your point of view as well as that of Éire’. Although it appears Peters would have willingly stayed on if the Irish offer of Assistant Director was agreed, he was finally recalled to London.

On January 7, 1941 Peters was posted supernumerary for training and investigation duties, Dr Doportto taking charge of the office from that date (Table 4). Peters left for Britain on March 6, 1941.⁷

Second Major Recruitment Drive

Recruitment of the second group of Met Officer cadets took place in the spring of 1940. In the changed circumstances, and unlike the first group of forecaster Cadets, this course was designed to take place entirely within the Meteorological Service. Initial training in observing and chart plotting took place at Valentia Observatory while an intensive course on theory and on the job training followed at Foynes. This group of Met Officer Cadets reported on March 11, 1940. In this group were Messrs Gerry Granville, Barney McNamee, Con Gillman and P. Kilian Rohan; Barney Doherty and Vincent Guerrini joined later in the year.

Immediately following the Officer initial course, the Cadets by then having moved on to Foynes for the next stage of their course, a second course for Met Assistants got underway at Valentia Observatory at the beginning of August, 1940. This group included Jeremiah (better known

⁷ On termination of his services in Ireland, Peters was posted to the new Gloucester civil aviation forecasting centre (opened October 1940), where it was ‘necessary to establish a special control station as the (Éire) Government declined to allow Foynes to be used in the trans-Atlantic flying of Service aircraft from North America.’ (File: DO 391/1, NA, London), yet, many top-level military and diplomatic personnel on active duty are known to have travelled through Foynes during WW II. Peters, and Harding, later became Assistant Directors in the BMO.

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as Dermot) O'Connor, Joe Hardy, Dick Mathews, Joe Graham, Paddy Howley, J.D. (Maxie) Kelly, Brendan Smith, Tommy Keenan, Ultan Egan, Jim McNamara, Tommy Reynolds, Maurice Keane, Dermot Keane, Paddy Butler and Des O'Connor. Ignatius Lambert was also sent on this Assistant training course. During lectures, unlike the others on the course, he frequently questioned Lamb on theoretical points (Ultan Egan, personal communication). Surprisingly, Lambert⁸ does not feature in the 1940 Assistant course photograph (reproduced elsewhere in this publication). This Assistant course lasted until October, after which Lambert was appointed O.C. of Valentia Observatory (Table 4).⁸

Both courses were directed by Peters and Dr Pollak. The latter was recalled to Dublin, however, during the year to take charge of the new Climatological Division being formed at HQ, and Hubert Lamb, who was designated Met Research Officer on June 1, was posted to Valentia Observatory as O.C. to assist with the training. Seán McWilliams was also assigned to Valentia Observatory during the summer to help with the practical aspects of observer training to the Met Assistant course, Lamb concentrating on the theoretical side. Later that year the cadet officers were given further lectures by Dr Pollak in the Dublin Andrew St. Headquarters.

The training of these new recruits was to place a new strain on the already stretched resources of the experienced personnel at Foynes. Apart from the aviation forecasting duties at Foynes, additional forecasting duties necessitated the preparation and issue of forecasts to various branches of the Defence Forces. By early 1940 these Defence Force commitments amounted to some 90 forecasts per day. They included flight and terminal forecasts for the Air Corps based at Baldonnel, Gormanstown, Rineanna Airport and Midleton, forecasts issued to the Navy, to the Anti-Aircraft Units in the vicinities of

⁸ Ignatius Lambert's prior experience in the UK is unclear but he did not undertake full training as a forecaster in the Irish Met Service until 1945 (see Chapter XI).

Recruitment in the Early War Years

Dublin, Cork and Limerick, to the Coastal Defence Units, to the Army Command and to General Headquarters.

Office routine at Foynes at that time was also expanding. During the winter Radio Section had organised regular reception of data from Newfoundland including observations, frontal analysis and tephigrams. The plotting of these reports was incorporated into Foynes Met Office routine by April 1940. The following month a scheme for plotting Canadian and US Upper Winds was introduced. The war in Europe impinged in various ways on the Foynes Met Office; east and mid-European data ceased, and in June 1940, on the fall of France to the Germans, French data ceased. Only a selection of data was received from Spain and Portugal, Great Britain, Iceland, eastern Canada and US and no weather reports from Atlantic shipping. Debriefing crews became an important source of weather information to forecasters in Foynes. This coincided with an increase in the use of Foynes as an intermediate stop between Poole and West Africa.⁹

Because of the war in Europe, air traffic through Foynes in 1940 showed a decrease on the previous year. Trans-Atlantic and cross-Channel flights for the three months August to October totalled 13 (27 meteorological services), less than that of 1939 (Foynes Harbour Masters Log, Tables 1 and 5). Pan American Airways, no longer willing to fly into the combat zone, terminated flights at Lisbon, BOAC shuttle services completing passenger journeys. During the autumn, a British research aircraft was stationed at Shannon and made daily flights over the North Atlantic collecting weather information. As the wind measuring anemometer had been placed on top of the Foynes island hill, an observer travelled over the night before a landing to provide wind readings from dawn, transmitting the observations by radio to Air Traffic Control on the launch.

⁹ The sea base at Hythe, adjacent to an industrial area of Southampton and thus under threat from bombing, had been moved downstream to Poole in June 1940. Owing to restrictions imposed by the war amendments were also made to TASSO at a meeting in Dublin, July 1940.

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Upon completion of the second Officer Cadet course on January 16, 1941 changes in staff assignments were made. Bourke, Leech, McWilliams, Tierney and Brown were made responsible for the work of the operations room in Foynes and for the authorising and the issue of warnings and forecasts. Hubert Lamb, now returned to Foynes, took charge of training assisted by Paul Brown. New services were introduced such as the regular issue of Thermal warnings to the ESB. Fred Dixon had also returned to Dublin HQ primarily to organise the Library but also to help with the newly-formed Climatological Division.¹⁰

¹⁰ With regard to Brown, Lamb, Morgan and himself, British nationals of military age, Dixon commented (unpublished) that some arrangement must have been made with the UK authorities, whereby they were able to visit home without being called up - their names were on special lists at the ports.

VI

Clerical Officers and the Confidential Met Code

Introduction

As a means of keeping meteorological information confidential in all communications to aircraft in flight, special arrangements regarding the supply and transmission of such data in time of war were introduced by the British when World War II commenced in September 1939. These arrangements involved enciphering all weather information, which would have been of great benefit to the enemy, before communication between offices and aircraft in flight. In the United Kingdom the Meteorological Office assumed responsibility for the protection and coordination of all such ciphered information. Thereafter the use of Confidential Meteorological Code (CMC) became an important function of the Met Office at Foynes for the secret coding and enciphering of weather messages both to and from aircraft and between met offices serving the trans-Atlantic route during the war years.

The employment of Clerical Officers in the Meteorological Service during the World War II years, 1939 to 1945 was synchronous with the introduction of the confidential code. Weather reports from the Irish stations were received by phone, those from Great Britain and America by radio and later teletype. As there was an urgency attached to meeting these new demands on the Meteorological Service, the Department of Industry and Commerce agreed that a number of staff would be specially recruited from within the Clerical Officer (CO) grade in the Civil Service to act as Communications Officers at the airports. A number of Clerical Officers were sought and initially six COs were

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temporarily seconded to the Meteorological Service. Other COs were recruited into the Service. The COs were paid an allowance of £50 per annum and, in addition to night duty allowance, they earned much overtime.

In time twelve COs covered the ciphering duties in three shifts. It was not unusual for COs to cease duty at midnight after a sixteen hour day and be back again at 8 am the next morning (Slattery, 2001). This was particularly stressful for those staff residing in Limerick city some 20 miles away. Most stayed through the war years, some remaining well beyond that period. The numbers had increased such that the Director, Austen Nagle, in a memo to the Department in 1943 seeking sanction for additional staff, stated that cipher staff numbered 20 officers. Slattery (2001) writes that, while CO staff at Foynes Met Office never exceeded 20, others were recruited to work in the Airport Manager's Office and in Air Traffic Control such that some 50 COs served in Foynes during the Emergency war years.

Some of the COs attached to Foynes for coding and deciphering included Michael Barrett,¹ Bill West, Timmy Desmond (a quiet man, *confidante* of anybody in trouble), Johnny Halsem, Jack Sweeney, Dinny Lawlor, Colm Jackson, Fergie Hall and Jim Harte. At times they assisted in plotting 'they were marvellous plotters' (Paddy (P.V.) Kelly, private communication); according to Slattery (2001) CO involvement in plotting began in 1943. A more complete listing of COs attached to the Foynes Met Office is given in Appendix VIII.

Coding Procedures

The coding procedure for weather messages used in the CMC was essentially in two parts. The weather messages were first converted into

¹ Michael Barrett was one of six Communication Officers, who came to Foynes on 15 November, 1939. Michael says: 'While we remained on the staff of the then Department of Industry and Commerce we were closely involved with the Met staff as the bulk of our work was coding and decoding weather information. I had more general duties from 1943 when I set up and ran the General Office – and acquired a typewriter.'

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a series of 5-figure groups as part of the normal procedure for coding. In the next stage the 5-figure groups were converted into other 5-figure groups not recoverable except by those with the appropriate key. The original 5-figure groups consisted of synoptic land and ship reports, route and landing forecasts and groups representing various forecast inference phrase words or letters. The recoding consisted of some 500 lines of 5-figure groups and the indicator groups were chosen at random.

The Syko machine and Syko cards were used for the encoding and the decoding routines. Codes were also changed at intervals. The Confidential Code Books were locked in the safe when not in use. Each Communications Officer was responsible for handing the books used by him to the Duty Forecaster at the end of his tour of duty together with all such versions of signals as he had dealt with during his duty.

Delivery of the Confidential Code to Foynes

An elaborate security scheme was put in place to ensure safe delivery from London of updates to the Confidential Codes for use in met transmissions at Foynes. The codes from the Air Ministry (Met Office) were passed to the Dominions Office in London which in turn passed them to the High Commissioner for Ireland in London. Dispatched from there to the Department of External Affairs in Dublin, which in turn passed them on to the Department of Industry and Commerce, they were given over to Meteorological Service HQ and safely delivered to Met Office Foynes. Each stage was logged and signed off. Frequent code updates and amendments meant regular dispatch from London to Foynes of the new codes together with instructions and the return to London of the old codes. Two sets of codes were in use, namely C.D. 115 for meteorological coding and C.D. 124 for the ciphering codes. The receipt of frequent updated variants of these codes was recorded in the Department of External Affairs files, e.g. C.D. 124 (4), 176 referring to the fourth version of code 124, copy number 176 (Department Ext. Affairs, file A14).

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With an increasing amount of weather information passing daily between Foynes and Botwood, C.D. 124 was found to be inadequate for recording increasingly large amounts of data and the so called FOYBO form with recoding tables, having a separate page of new coding for each day of the month, was introduced in 1941. Monthly tables were dispatched in batches from London to Foynes, seemingly two months ahead of use. Also at this time, the procedures for the return of the old codes to London seemed to have eased and a certificate of destruction was all that was needed.

However, again because of continuing increase in trans-Atlantic W/T (wireless telegraphy) traffic, and difficulties experienced in supplying various types of cipher, the British Air Ministry decided to adopt a standard form of pad cipher and replace FOYBO by the FOYPAD one-time pad system (whose strength lay in its randomness and one time use). These pads were to be destroyed seven days after use.² The last recorded updated version to the codes was made on September 2, 1944.

Examples of Airline Procedures

In 1943 a new code for provision of reports of landing weather conditions by fixed time broadcasts, and on request, for benefit of aircraft in flight, was introduced (Wilson, 2001). In the 1943 version of TASSO, the principle of giving meteorological advice to aircraft in time for action before reaching the point of no return was instituted as a safety measure.³ As all messages transmitted to aircraft by radio were first enciphered it was necessary to ensure that they were dispatched to

² Dixon (IMS-50) said that the Irish Meteorological Service was given, at some undated stage, responsibility for preparing one set of cards and both he and Librarian Michael (M.J.) Finnegan had to supervise their printing in the confidential section of a certain printing works. Also noted in the files was the acquisition from the UK by the Defence Forces through the Meteorological Service of 20 Syko secret coding machines at a cost of £4-15s-6d each.

³ By then PAA weather observation and reporting procedures from aircraft had been incorporated into TASSO.

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the ciphering room in good time. For example, forecasts for American Export Airlines (AEA) flights New York to Foynes from 40°W eastbound, altitude 7,000 feet and airspeed 122 knots, had to be handed to Ciphering 8½ hours before the estimated time of departure (ETD) at New York. The enciphering of the message took about half an hour to complete.

The following example gives an indication of the rigid procedures that were followed by airlines. In the PAA 1943 operations, the Captains' copies of TASSO, Vol. 1, Part 11, copies 124-129 and Syko Cards 17-22 of set No. 41 were reserved for PAA aircraft on the Foynes Lisbon route. Six envelopes numbered 1 to 6 were issued containing the TASSO⁴ copies and cards in numerical order. These were intended for use on the northbound journeys Lisbon to Foynes. For example, Envelope No. 1 (say) and its contents were brought on the first northbound flight from Lisbon to Foynes and envelope No. 2 was brought on the next northbound flight, etc. These were handed into Met Foynes and a receipt was given for the Organisation, Card and observations received. The next outbound flight to Lisbon after receipt of Envelope No. 1 was given a new unsealed envelope No. 1 for transporting to Lisbon.

On reaching Lisbon the envelope and its contents was handed to the Irish Charge d'Affaires, who sealed it and issued it to the appropriate northbound PAA aircraft on some later date. The numerical order of issue of Cards and Envelopes northbound was preserved. Weather messages were then able to be passed to the aircraft in the appropriate cipher held by the aircraft without reference to the number of the Syko card held. Apparently the US companies used their own enciphering code (Slattery, Appendix X) and in October 1943 the USA companies introduced the Hagelin type coding machine.

⁴ The Meteorological, Communications, Navigation, Control and Alerting organisation procedures set up by TASSO (Trans-Atlantic Air Service Safety Organisation) in 1938 had proved to be essential elements in the safe crossing of the North Atlantic (Peter Berry, MRAeS, 2005).

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Protection of the Meteorological Office, Foynes

Elaborate security arrangements were put in place by both the Met Office Foynes and the Defence Forces to protect the confidentiality of the coding operations.⁵ All inward and outward messages for/from Met, Radio, Control and airline companies passed through the Coding Room. Thus the circulation of coded forms was between the Coding Room and the Radio Room. Access to the coding room was strictly prohibited to all unauthorised persons. At least two Communications Officers were always on duty locked into the coding room throughout the 24 hours. The senior Coding Officer on duty was personally responsible for the code books; when not in actual use these books were kept in a safe, the keys of which were kept by this Coding Officer, and were removed only for actual use; after use they were replaced in the safe. At every relief the keys and code books were formally handed over to the incoming man who examined and signed for them.⁶ No visitors and only specially authorised members of staff, which included the O.C. or in his absence, the Deputy O.C. of Met Foynes, were admitted to the Coding Room (see Appendix I and Appendix X).⁷

A notice to all staff at Met Foynes was issued by the Director in November 1940, requiring their individual signature of acknowledgement, reminding them that it was 'essential in the present abnormal circumstances that every effort be made to avoid discussions

⁵Apart from Met and Radio, in the Monteagle Arms Hotel were also housed the Control Officers, staffed by the Air Corps under Capt Stapleton, Capt Norman Hewitt, an intelligence officer, P. McCarthy, Department of Industry and Commerce, all under over-all supervision of the Airport Manager, Col Patrick Maher (information supplied by Michael Barrett, CO).

⁶ This seems an easing of earlier procedures for the more formal handing over through the duty forecaster.

⁷ Apparently, two types of cipher machines came to be used in Foynes: - The Syko machine favoured by the British in use from 1939 and the Hagelin type machine introduced by the US companies in 1943 - P.V. Kelly recalls accompanying the transfer of a Hagelin cipher machine to Rineanna at the end of operations in Foynes in 1945.

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outside the office of any aspects of the work of this office, particularly in the hearing of non-members of the Met staff.’

In the early years of the war a military guard was mounted in the ante room to the coding rooms (Gillman quoted in: de Cogan and Kingston, 2001). While the Met Office kept to its brief of strict security, over time, re-assignments of the Defence Forces resulted in modified security arrangements. In 1941 sentry duties were withdrawn from the immediate vicinity of the airport to a more distant location at Mount Trenchard House some two miles away. From there the coding room was phoned on a secure telephone line at 15-minute intervals expecting a response using a daily changed code word to reassure all was in order (EDP/30, Military Archives).⁸

Nagle had misgivings about the adequacy of security arrangements and reported these to the Defence Command H.Q. In making his argument Nagle pointed out that four secret codes were kept at Met Foynes, namely, one for BOAC, two for British Air Ministry, and the Meteorological Service’s own code, all of which were in use. He stated that the British had provided these codes on the understanding that they would be adequately protected. Because of war-time security, the amount of meteorological information available for analysis and forecasting at Foynes was greatly curtailed. Only recently he had been successful in acquiring certain additional meteorological data not available to Foynes. This had been achieved following representations to the British Met Office and a visit to Foynes by (then titled) Captain Entwistle, reassuring him of the security arrangements taken there. Nagle reasoned that the Local Defence Force (L.D.F.) guard could not be considered satisfactory and, as the meteorological personnel were working up to ‘80 hours a week’, they could not supply sentry duty.

In December 1941 the adequacy of the security for the Met Codes again arose. This followed a purported (aside) remark from the Office of the British Representative, Dublin following a visit by an official to

⁸ From the Defence Forces records it appears that their code name for the Foynes Met Office was X D.

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Foynes, that questioned the adequacy of the Met Office security arrangements. This caused some stir in the relevant Departments, i.e. Industry and Commerce (see Appendix I), External Affairs and Defence and a review of the arrangements was requested by the Minister for Defence in January 1942. (EDP/30, Military Archives)

As part of the review by the Chief of Staff, the Officer Commanding, 1st Division, was requested to re-examine the situation. In a follow up memo it was proposed that the 'documents which it is sought to safeguard' be confined entirely to one room (indicated in plans as Room 3 B) while the adjacent room (Room 4 B) would be made available for the use of the military personnel to be detailed for protection. This was to replace the existing arrangements whereby the documents in question (ciphers) were kept in 3 B but transferred to 6 B when in use. It was felt that the guard should consist of 3 men armed with revolvers and that the military should not re-enter into occupation of the building on the same basis as heretofore. The alternative was to have the armed guard remain constantly in sight of the documents and accompany them from office to office while they were being used.

Slattery (2001) also wrote of a weather report being sent out in the 'clear' which was later complained about by the British. He did not date this happening except that it immediately preceded the introduction of different coloured pads, which took place in 1942. In the event, a guard was mounted at the airport in October 1942 placing a sentry at the entrance gate to the building housing Met Foynes.⁹

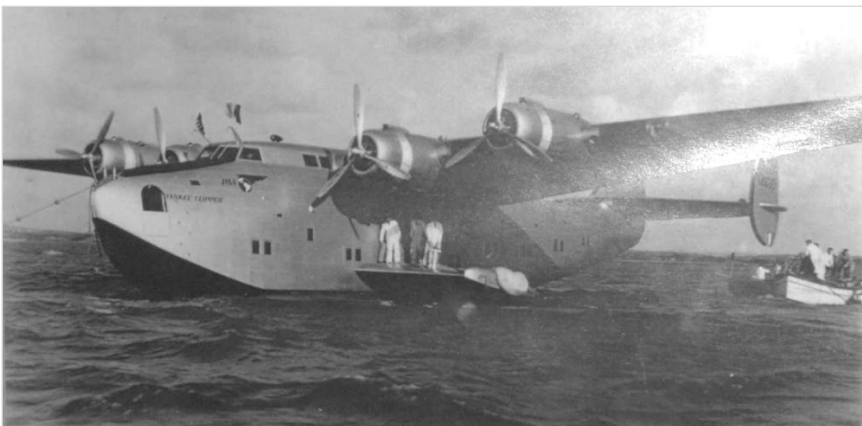
⁹ All point-to-point radio messages were coded except for landing and departing aircraft. Traffic comprised weather reports, navigation directions, operating company messages, etc. As part of strict security all outward messages to terminal stations were coded in the Coding Room and passed to Radio; inward messages were passed from Radio to the Coding Room, i.e. the circulation of coded forms was solely between the Coding Room and the Radio Room. No outward message for transmission was accepted by the Coding Room unless properly authenticated and certified. Some Government use was made of the Ballygirreen Radio to send messages to Irish Legations in Washington and the Vatican in code and in the clear (Corbett, 1986). The amount of information communicated to aircraft on the ground and in the air was of necessity kept to a minimum (Wilson, 2001).



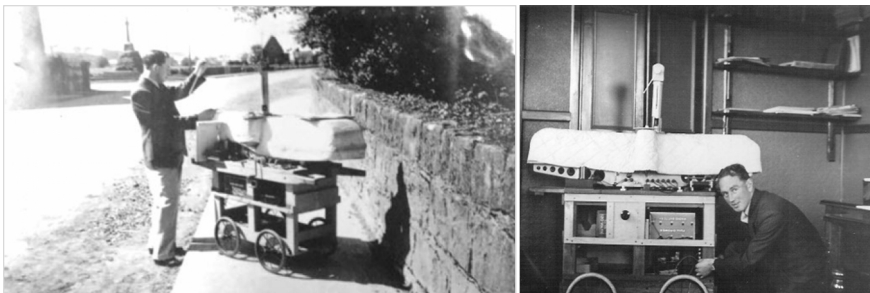
Panoramic view of Ardanoir, the Shannon Estuary landing site and Foynes Island (Foynes Museum and Archive)



The flying-boat base at Foynes (photo: P.K. Rohan, IMS-50)



Yankee Clipper at Foynes captained by Harold Gray. 1939 (notable Clipper dates: proving flight, April 11; 1st mail flight, June 2; 1st commercial flight, July 9)



Left: Seán McWilliams making air quality observations with the No. 2 Spectro-photometer opposite Foynes Met Office. (F.E. Dixon; Foynes Museum and Archive); and right: Spectro-photometer No. 1 being prepared by Seán McWilliams at Valentia Observatory where it was located. (photo: courtesy Anne McWilliams)



*Left: Hubert H Lamb in contemplative mood while in Foynes in the 1940s.
Right: H.H. Lamb, who had a petrol allowance, loading his 'Standard 8' convertible (photo: Foynes Museum and Archive)*

VII

Increasing Pressures on the Meteorological Service

Changes in Foynes Office Routines in 1941

(a) Changes in operational routines

A major reorganisation of the routine analysis was introduced at Foynes in June 1941. Twice daily analyses of the wind flow and temperature pattern at the 10,000 foot level over North America and the North Atlantic using the theories of Thermal Winds and of frontal sloping were introduced (see Appendix IV, No. 19). The construction of a number of vertical cross sections through the atmosphere over these regions was also introduced into the routine. A mobile observing duty was introduced, experimentally at first, instead of the Foynes Island based night duty on the occasions when an aircraft was due to arrive.

(b) Changes in Staff

The Bristol-Dublin route was opened in July 1941. With the summer season over at Foynes further staff changes took place from September 1941 arising from a decision to upgrade the Dublin Airport office to a forecasting centre with round the clock observations.¹ Dr Doportto was

¹ Meteorological and Radio Services were temporarily housed in an old red bricked building, dating from WW I, until moved to the third floor of the terminal building in March 1942. Kavanagh (IMS-50) recalled some staff (forecasting, assistant and COs!) as: Bourke, Gillman, Twomey, McNamee, Molloy, O'Brien, Roche, Brennan, McCrum, Cass, Smith.

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transferred there as O.C. on September 19, Hubert Lamb taking over at Foynes (Table 4). Austin Bourke, Shane Tierney and two Clerical Officers were posted to Dublin Airport in October followed by Barney Doherty and Con Gillman early in November.

(c) Overcoming Reduced Availability of Met Data

Hostilities in Europe had certainly curtailed the reception of synoptic data at Foynes especially from the mainland of Europe. Since most of the weather systems approached from the Atlantic the curtailment was not serious. But during 1941 the problem with missing synoptic data from North America and the North Atlantic region became more acute. During September data from Greenland ceased and regular synoptic weather broadcasts from the North American station WSY ceased on October 6, two months before the attack on Pearl Harbour. Intermittent transmissions of ship reports and aerological data to VOAC² were intercepted for a while from the Iberian Meteorological broadcasts. The Weather Service in Newfoundland very kindly agreed to co-operate with Met Foynes and broadcast routinely weather analyses for Canada extending to the US border.

To help fill the void in weather reports over the North Atlantic, alternative analysis procedures had to be undertaken. The analysis of the west North Atlantic was taken largely from the ANAL³ messages received from Weather, Newfoundland. The 10,000 foot charts were built up from the surface mainly on theoretical estimates while the eastern section was done as a routine. The only weather observations available from the North Atlantic to Ireland, a neutral country, were in flight observations brought in by the aircraft after arrival, so that crew debriefing was important to Foynes (Lamb, 1997). The Air Corps at Rineanna began daily meteorological flights in January 1942.

² Voice of America Canada - Gander Radio Station, Newfoundland

³ Meteorological analysis (e.g. isobars, fronts, areas of significant weather) specified at various points, adequate to describe the given situation, in degrees latitude and longitude.

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Continuity from chart to chart proved difficult to achieve, especially as many of the staff at Foynes lacked sufficient experience. Supervision of analysis of charts was tightened up later in the year with the introduction of a policy of regular intervention by the O.C. with a view to achieving continuity. Tolerance between eastern and western halves of the analyses was set at 100 - 150 nm (nautical miles) in the position of fronts and 250 nm in the position of wave disturbances. American synoptic data were received very irregularly through Britain but data were often between 7 to 15 hours late.

(d) Increased Flight Numbers

From May 1941, southern and African flights were routed via Foynes to Lisbon well clear of occupied France, Foynes for the first time assuming responsibility for full meteorological protection on the Foynes-Lisbon section of the route (see Appendix II).⁴ In June there had been a steady increase in the number of flights using Foynes or needing meteorological information from Foynes. In July the number of meteorological reports and forecasts prepared at Foynes for scheduled operations rose to 54 compared with 11 for August 1940, the busiest month of that year, or compared to 23 during the whole of the flying season of 1940 (variance with Table 1 arises as a number of the Rineanna flights used the one forecast). From October, due to stronger westerly winds prevailing in the North Atlantic and the bay at Botwood frozen over, the Atlantic winter southern route via Lisbon and Bermuda to New York was used (see Appendix IX).

While the preparation of met reports and forecasts was only part of the workload at Foynes nevertheless it was a useful yardstick, showing a fivefold increase of aviation work at Foynes. 'I must confess', wrote Nagle to the Assistant Secretary of the Department of Industry and

⁴ Wilson (2001) says that responsibility for forecasting was shared: Gloucester was confined to the eastern half of the stage, Poole-Shannon and the southern half of the stage, Lisbon-Shannon, Foynes responsible for the remaining sections.

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Commerce, ‘that, although I knew that there had been a considerable increase in work, I had not realised that it was so formidable’.

The complement of staff at Met Office, Foynes in August 1941 had reached 35 consisting of one Senior Met Officer, five Duty Forecasters and six Cadet Forecasters, 16 Junior Met Assistants and seven Clerical Officers (Table 3).

1942 Landmarks

(a) Rineanna opened for the use of Land Planes

Flight Operations at Foynes for 1942 looked very promising. Pan American Airways (PAA) proposed to operate through Foynes using the northern route (for the first time since its last flight in October 1939) after the US entered the war. Pan Am flights were resumed in spring 1942⁵ while American Export Airlines (AEA) began operations in June 1942 both on a twice weekly basis (see Appendix IX).⁶ Capt. Blair made the first nonstop passenger flight from Foynes to New York in a time of 25 hours 40 minutes.

In March alone there had been over 120 special forecasts and Previs (route forecasts; see Appendix II) provided for 70 arrivals and departures (Table 1). The volume of traffic required extra moorings to be built and "tailing-up" points were placed on Foynes Island for the attachment of aircraft when warming up engines. Rineanna was opened using grass runways during February for the use of land planes. Shuttle services from Whitchurch (Bristol), connecting with flying boat operations at Foynes, were carried out from there. An assistant was sent to Rineanna (together with Radio and Control personnel) to make observations during landing and take-off.

⁵ In 1942 US Weather Bureau agreed to provide PAA aerometeograph data to Irish Met Service but ‘abandoned plans due numerous difficulties encountered’.

⁶ An AEA flight under Capt Charles Blair also made a survey flight to Foynes in May with nine passengers and 11 crew.

Increasing Pressures on the Meteorological Service

When flights started at Rineanna, February 21, 1942 the forecast giving landing conditions at Rineanna was issued by Met Foynes to aircraft on receipt of a message giving the number of the Syko Card held by the aircraft and requesting these conditions. The transport of a Syko machine, Syko cards for the flights and Syko Card indicator number for use by both Assistants and Clerical Officers on Rineanna duty was arranged daily, both outward in the morning and return journey at night. Frequently a BOAC representative transported them; otherwise a taxi was employed for the purpose.

(b) Dublin Trans-Atlantic Air Conference

A Trans-Atlantic Air Conference was held in Dublin during the month of April 1942 which related to the organisation for the operation of direct trans-Atlantic flights Shannon/Newfoundland and connecting air services. Taking part in this conference were representatives of the Governments of the US, Canada, United Kingdom and Ireland, as well as the airlines PAA, American Export Airlines (AEA), BOAC and Aer Lingus Teórantá (ALT). PAA was allowed to resume direct trans-Atlantic flights starting in May. Services terminated at Foynes and connecting services to the United Kingdom were provided by BOAC. PAA passengers went by landplane from Rineanna, or by BOAC shuttle flying boats, usually Short Sunderlands, from Foynes to Poole. AEA were also permitted to operate four round trips per week, the inaugural flight occurring on May 20.

Another important landmark of that year was the bringing into force in February 1942 the revised edition of the Trans-Atlantic Air Services Safety Organisation (TASSO, 1941)⁸, regulations governing procedures and practices relating to Air Traffic Control,

⁷ This meeting was first proposed at a United Kingdom meeting between the Air Ministry and British Airways in March 1942. Irish aviator Capt Jack Kelly-Rogers, among others, represented BOAC at the April meeting.

⁸ A parallel system, basically TASSO modified for high density traffic, was operated for aircraft flying between Montreal and Prestwick (DS 43225/1, BMO).

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Communications and Meteorology to be followed in respect of civil trans-Atlantic flights including those from Poole and Hurn through Shannon Airport. Ireland had responsibility for editing and production of the document, Nagle being assigned the Meteorology section, and Martin O'Herlihy was Secretary to the meeting.⁹

From the onset of WW II, reception of meteorological reports at Foynes was confined to those from Ireland, Great Britain, Portugal, Spain, Azores, Iceland, Canada and the United States. Following the Pearl Harbour attack, December 7, 1941, the American reports were restricted to New York, New England and Newfoundland areas. A perusal of the Foynes analysed D-charts of the period stored in the Foynes Flying Boat Museum and Archive confirms this further restriction of data. This, together with considerable delays in reception of the latter American data, posed serious problems for the Meteorological Service and approaches were made to the British.

A letter from the Dominions Office, London, to the High Commissioner in Canada, sought information about the Canadian practice in supplying meteorological information to Ireland. It pointed out that the British exchanged information with Ireland, surface and upper air, 'owing to their situation (Éire) stations (were) of great importance, and (such exchanges) enabled the Éire Meteorological services to meet the demands for meteorological advice made upon it by the United Kingdom Air Services.' The Irish reports were being passed on to the United States and Canada whereas the US and Canadian observations were not passed on to the Irish. The Canadian practice and intention was desired in view of the imminent resumption of northern route trans-Atlantic flights in 1942 by BOAC and the return of US airline services suspended at the outbreak of war. If the information was supplied to Ireland, then the teleprinter network would be available for relaying the observations.

⁹ The volume of work associated with the Irish commitment to TASSO can be gauged from the number of files opened in the Meteorological Service on the subject, i.e. W.S./S. Nos. 44-55. Unfortunately, none is available for inspection.

Increasing Pressures on the Meteorological Service

It is no surprise then that the question of reception of US and Canadian meteorological data loomed large at the Dublin Trans-Atlantic Air Conference, April 1942. The Irish representatives drew attention to the serious handicaps imposed upon the met organisation at the Shannon Airport by the then lack of basic met data from certain regions and by the delays which occurred in the receipt at Shannon Airport of similar data from other regions. The Irish expressed dissatisfaction with the meteorological organisation proposed by the United Kingdom Met Office for civil trans-Atlantic flights.

The effect of the new organisation was to cut off Shannon from direct contact with Newfoundland, which it had enjoyed, and basic meteorological data required by Shannon was now relayed over a circuitous route from Dorval, Canada to Prestwick, Prestwick to Dunstable (Eta¹⁰), Dunstable to Collinstown and Collinstown to Shannon by teleprinter causing a delay of 8 to 13 hours. As forecasts were required 24 hours ahead of non-stop flights based on data a day and a half old, the resulting forecast could not be expected to be reliable. The meeting proposed that delays over the new circuit would be remedied and also that Ireland approach Canada for a link off the new Dorval-Prestwick circuit and decoded at Shannon.

The Conference also agreed to the exchange of the requisite United States meteorological reports with Foynes together with a suitable cipher but that the Irish (and British) reports would be relayed to Washington through British channels, not directly from Foynes.

The Canadians were unhappy with this outcome, causing the Deputy Minister of Transport, C.P. Edwards, to write 'if this Department had had any idea that the Dublin Conference was to be used for the purposes of endeavouring to disrupt the present forecasting system, we either should have refused to attend or should have arranged for the attendance of a meteorological officer competent to discuss these matters.'

¹⁰ Wartime code name for Dunstable Central Forecast and Communication Offices

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A further conference was arranged for August in Ottawa. Since important security issues were involved, under pressure from Canada, Ireland, being a neutral state, was not invited but would later be briefed by the United Kingdom. The principal point of the meeting from 'the technical point was the alleged delay experienced by the Irish Service in obtaining N. American synoptic data via existing channels...(and the need) to discuss, inter alia, procedure for transmission of meteorological information in connection with trans-Atlantic routes.' (NA, London, file BJ 5/118). The Ottawa Conference was later followed by one in Washington in September 1942.

On June 26, 1942, a representative of the Meteorological Office had cause to complain to the Dominions Office 'regarding Nagle not replying to six messages (since May 25) relating to procedure in regard to the Shannon-Botwood organisation and in certain cases calling for straight answers.' While allowing that Nagle might have been pre-occupied with other matters, 'on the other hand there may be an amount of resentment at our "interference" with matters which he feels concern only Éire and Canada. (I) certainly felt the latter throughout the Dublin Conference.' (BJ 5/118)

In the meantime the Department of Industry and Commerce wrote to the Station Superintendent British Airways (now BOAC) in Foynes alerting them to the situation on the lack of and delay to data reception and advised 'that, although the Met. Office, Shannon Airport, will endeavour to give the best assistance possible in the circumstances to the operation of your Company's aircraft, it (was) likely that the service of met. protection and assistance which we can give may fall appreciably short of that which we have given in the past...The Minister regrets that, due to circumstance which are entirely outside his control...(and) he trusts that it will be possible at an early date to make such arrangements as will enable the Met. Office to provide the customary service of met. protection subject only to those limitations imposed by the war situation which are common to all Met. Offices.'

Increasing Pressures on the Meteorological Service

The Dublin April Conference also considered a revision of the basic principles of the TASSO system, many of the meteorological principles which had evolved in the Irish Meteorological Service. These had been incorporated into the Trans-Atlantic Air Services Safety Organisation and accepted in 1939 by the International Commission on Aeronautical Meteorology, to cover a number of additional routes. Later, in August-September 1942, Nagle accompanied by Lamb and three representatives of Air Traffic Control and Radio Communications attended a TASSO Conference in Ottawa before journeying onwards to New York to attend a meeting in La Guardia Airport (mostly relating to the Syko coding arrangements) and to see the facilities in use in the United States (O'Sullivan, 1997; Lamb, 1997).

The TASSO organisation was based fundamentally on that developed during the years 1937-1939 but periodically modified and extended in the light of war time experiences (DS 43225/1, BMO). After World War II, a North Atlantic Route Service Conference was held in Dublin Castle in March, 1946 resulting in the North Atlantic ICAO (International Civil Aviation Organisation) Manual which replaced the TASSO Manual, 1938-46 (Peter Berry, MRAeS, 2005).

(c) New Foynes Procedures in Flight Forecast Presentation

As already discussed in relation to the 1941 flying season, ever since June of that year there had been a steady increase in the number of flights using Foynes and needing meteorological information (see Tables 1 and 5). Apart from flights to Europe, trans-Atlantic flights in 1942 were taking place to Botwood, New York and Bermuda (see Appendix IX). Over 200 forecasts or Previs (route forecasts) were prepared in July 1942 alone for some 150 flights. This was a threefold increase over July 1941, which was a fivefold increase over the busiest month, August of 1940. In July 1942 there were seven times as many operations as in the whole of 1940. In August there were over 160 flight performances out of Foynes.

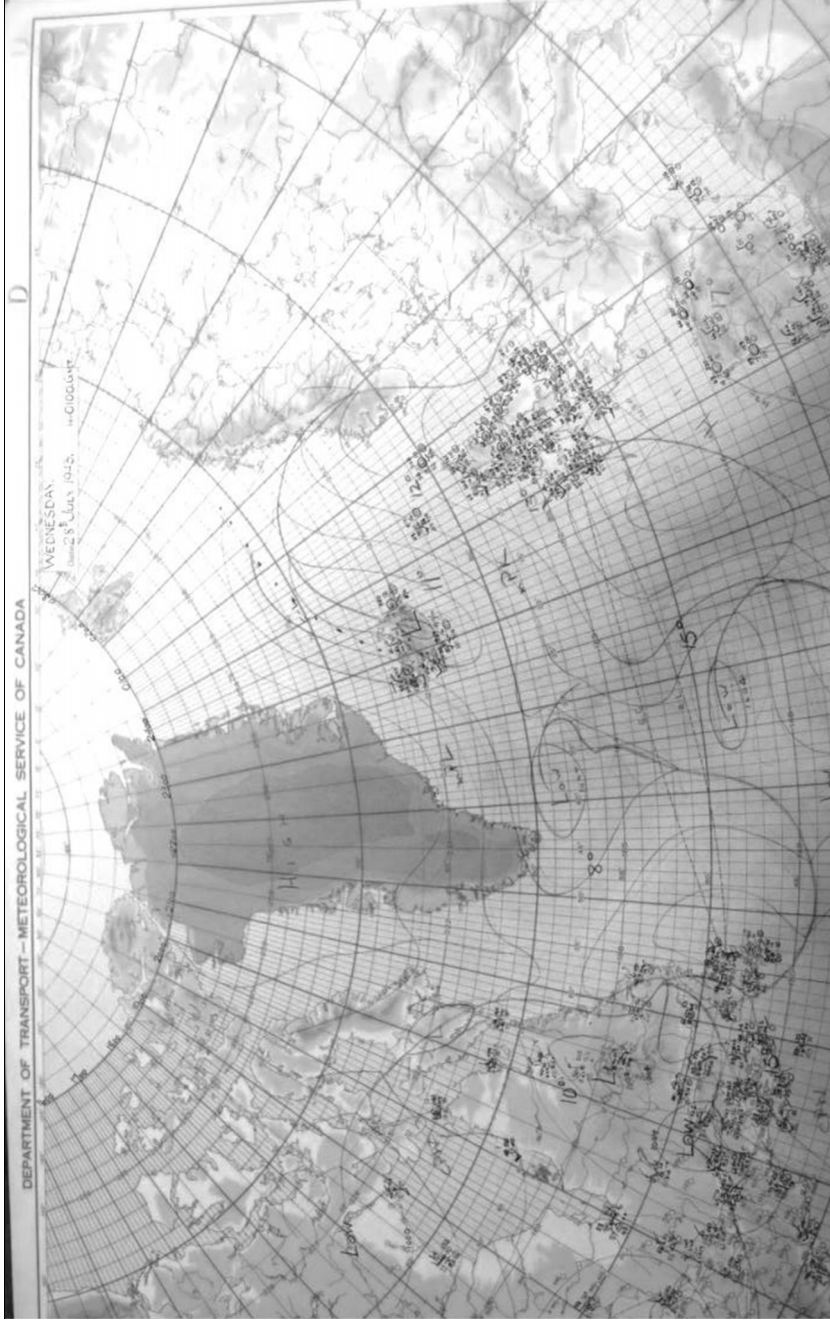
Establishment of the Meteorological Service in Ireland

Each flight needed extensive flight documentation. Ten to twelve hours were spent in the preparation and making of forecast charts for different times during the flights. In the formal pre-flight briefing with charts and weather reports to the entire crew, frequently a double crew, and finally signed-off – the forecaster was ‘rather somewhat like an expert witness in court’ (Rohan and Gillman, IMS-50).¹¹ According to Lamb (1997) this pre-flight forecast discussion briefing ‘was an exercise in honesty and complete openness’ (see Appendix II).¹²

In the meantime, improvements in the presentation of flight forecasts were engaging the attention of forecasters at Foynes. As a result a new procedure was incorporated into the forecast folders in July 1942. Pictorial representations of forecasts, in the form of cross sections in the vertical of the weather along the proposed flight routes, were provided in Pilot Met Reports for flights on the Shannon to Newfoundland and Shannon to New York routes for the first time.

¹¹ Important and critical for all flight planning was the Flight Folder of some 12-18 typed pages giving detailed information on the meteorological situation and forecasts, en route weather, wind/temperature at intervals of 5° longitude, surface to 4000ft (Lisbon, up to 10,000ft Atlantic route), actual and forecast surface charts for North Atlantic and peripheral areas; forecast conditions at Foynes and the destination and alternative airports. Some 12-18 hours was invested in the preparation of these folders.

¹² At these pre-flight conferences, the forecaster was surrounded by the various stakeholders in the success of the flight, such as aircraft Commander, co-pilot, navigator, radio operator - frequently a double crew, Flight Dispatcher/Operations Officer, Company Station Manager, Air traffic Control Officer. Many searching questions relating to deviations and confidence on information were asked before the flight documentation was signed off.



'D' Chart analysis at 0100 GMT on July 28, 1943 on the night of the G-AGES crash into Mount Brandon.

Note absence of data over Europe, except Iberian Peninsula, and over the North Atlantic ('D', Determinate)



*Left: Dr L.W. Pollak, in Austrian army uniform in which he served during WW I;
Right: Dr Mariano Doporto (photos: Irish Times; Shields, IMS-50)*



Austin Bourke on his wedding day 1945 wearing uniform proposed for Meteorological staff. Senior Met Officers (Deputy O.C.) had two lower sleeve stripes (photo courtesy of his daughter Iseult Bradley)

VIII

Office and Social Conditions in Foynes

Concerns of Staff Association

The ever increasing demands made on the Irish Meteorological Service added to the difficulties under which the staff, particularly those at Foynes, had to operate. Many changes or transfers had been made in the autumn of 1941 particularly when the Met Office at Dublin Airport became fully operational. Even as the second group of Cadets completed their two year probationary period on March 11, 1942, the total complement of staff at Foynes had fallen from 36 in August 1941 to 32 in February 1942. This occurred in a time of expansion of the Service as a whole from 46 to 79 over two years (Table 2; Appendices VI, VII and VIII).

Both the lack of proper office and private accommodation at Foynes added to the stress on staff. The lack of proper office accommodation was further aggravated by the fact that a number of operational rooms were set aside, e.g. the Cipher Room, and placed out of bounds for all with the exception of those with *bonafidé* reasons for entering. Foynes was an isolated village in the west of Co. Limerick bounded on the north by the river Shannon.

(a) Official Recognition of New Staff Association

It was never intended that the Foynes office would have to accommodate such an influx of people in such a short time. A staff association – *Cumann Lucht Mbeitéareolaíochta na hÉireann* (CLME) – comprising all the grades working in the Met Office in Foynes was soon

Establishment of the Meteorological Service in Ireland

formed in an endeavour to improve the conditions under which its members had to operate. CLME was recognised by the Department to represent staff members in the autumn of 1941. At that time the members of CLME, included Met Officers, Meteorological Assistants and Clerical Officers working within the Meteorological Service.^{1, 2}

In September 1942 Mr R.C. Ferguson, Secretary of the Department of Industry and Commerce, met representatives of the Foynes branch of CLME for the first time to discuss the congestion of the Operations Room and the housing problems in Foynes. The overcrowding of two badly ventilated rooms had been raised on May 23, 1942 in a letter on working conditions and requesting that part of the staff should be removed to another room, that electric fans and insect screens be put on the windows and that a meal room and an air raid shelter are provided. Letters of protest at inaction on these matters were sent during 1943. A second meeting with the Secretary of the Department took place in June 1944. Eventually in September 1944 a telegram was sent to the Secretary requiring immediate action.

(b) Overtime and Annual Leave

Representations were also made from time to time about official duties such as working hours and annual leave. Between 1941 and 1944 fifteen communications had been made to the Department on the lack of summer holidays and on the excessively long hours that had to be worked by staff. Many may now find it hard to believe that the Met Officer (forecaster) roster incorporated four consecutive duties lasting from 9 am to 11 pm. The position with respect to Annual Leave (AL)

¹ This review is partly based on a 1944 summary of CLME activities through the previous years by its then Secretary, Leslie Leech.

² Although served by a single staff association, during the 1940s the different interests of the grades began to manifest themselves. The Clerical Officers broke away in January 1944 and the officer graduate grade withdrew some few years later. In 1944 Branch Secretaries of CLME were Martin O'Herlihy and Vincent Guerrini (Joint Secretaries, Foynes); and local representatives Shane Tierney (Collinstown (Dublin Airport)), Fred Dixon (HQ) and Jim McNamara (Valentia Observatory).

Office and Social Conditions in Foynes

had become so grave by 1944 that a means of alleviation was imperative. Since 1939 the average number of AL days in the summer months of June to September inclusive consisted of 0, 4½, 1½, 3, and 5½ (1943). In 1943 five assistants received no Summer Leave.

A notice stating that no further AL could be granted was posted each year in early summer. Overtime too, averaging 16 hours per week per man (paid for since 1942) was such that a state of physical exhaustion and debilitation was claimed to have been reached. This in turn resulted in long sick leave absences. In particular the frequency of 9 a.m. to 11 p.m. duties was a severe hardship from which staff needed an immediate respite. In 1942 the AL for Met Officers consisted of practically no Summer Leave and none in 1943 except for one officer for sympathetic reasons. Very few public holidays in lieu of Christmas and Easter were given. The average hours of most rosters over 1942 and 1943 were 45 hours per week excluding meal breaks.

While some hardships connected with Civil Aviation were inevitable the CLME Executive felt that staff offices, extensive overtime, irregular hours and split duties, meal breaks and frequent night duties taken together caused a severe physical strain on staff. Added to this was two and a half hours travelling time or the endurance of squalid and unhealthy living conditions in Foynes 'not normally tolerated in a civilised community.' The Government had, the Executive thought, 'a fundamental responsibility to provide the facilities of decent civilised living to those of its servants posted at Foynes' and to do so in such a way as not to penalise them financially.

As to why excessive demands were made on staff, Austen Nagle (in response to a private enquiry in 1980 during a visit by him to Dublin) replied that he was determined to dispel any doubts (in the UK) whether the Irish would achieve the high standard of meteorological service required, particularly by aviation. Lamb (1997), thought that Nagle was understandably ambitious that his service should play a part in all relevant branches of the nation's life, adding 'from some time in 1943 and early 1944 he took on, and instructed the main trans-Atlantic

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weather forecasting office at Foynes to perform, an increasing range of services to the community without being able to employ and train any new staff.³

(c) Menial Duties

Other and perhaps more contentious problems faced the *Cumann* in those early years. The first of these concerned the menial duties imposed on the Assistants and Clerical Officers including looking after lavatories, changing lamp shades and painting articles. In spite of the risks involved, the *Cumann* eventually raised these matters with (Civil Service) Establishment in February 1943. However, some Assistants had already compromised the *Cumann*'s position by an action of which the committee was unaware, the writing of an injudiciously worded letter on January 20. The individual Assistants were all interviewed by the Secretary of the Department and by the DMS (Director of the Meteorological Service), and expressed regret for the tone of their letter.

(d) Living Accommodation in Foynes

Another issue which the *Cumann* pursued concerned the state of housing and bus service facilities. In January 1941, the staff at Foynes, Dublin and Valentia Observatory submitted a memorandum to the Secretary of the Department pointing out the absence of suitable living accommodation at Foynes. In the memorandum they requested a Mess and Club Rooms and a limited number of married quarters. Individual agitation had taken place in 1942 and a deputation went to see the Secretary in September of that year. As a result a State Limerick-Foynes Bus Service was initiated in December 'to provide immediate alleviation'.

³ Dr Pollak (Appendix XI) reportedly once remarked that discipline in the Irish Met Service was greater than that operated in the Austrian army where he had served during WW I (source: the late Jim McMonagle).

Office and Social Conditions in Foynes

The personal accommodation issue was said to be engaging 'active attention'. A meal room was provided which had an 'inefficient range'. In February 1943 the Airports Committee decided to build a restaurant at Foynes to meet minimum requirements only, pending consideration of the general development at Foynes. A month later a second decision by the Committee provided for a full hostel and restaurant accommodation to be put in hand.

(e) Pathway to Instruments Enclosure

The pathway and entrance to the Instruments Enclosure in Church Field also absorbed much of the Cumann's attention since 1941. The work on the pathway was first agreed to in the summer of 1941. In December 1942 O.C. Foynes, reported to DMS that the conditions of the field at the end of the month was such that observers can only read the instruments at the cost of damaging their clothes, and that there was a real risk of their falling into the 'deep sewage culvert alongside the slippery stile' over which they must climb to gain access to the field. The pathway was eventually cemented in 1944.

(f) Refusal to wear Uniforms

It became known unofficially about June 1943 that the Department was anxious to introduce uniform clothing for official use by State Staff, i.e., both Meteorological and Radio staff. There was general antipathy among staff towards the introduction of the uniform. The staff associations disagreed with the official suggestion for the use of a dark blue material, similar to P & T postmen, and to rank markings. The antipathy to rank markings was based mainly on the fact that they act as a badge of official position and salary scale when worn outside the office.

In August 1943 there had been a leakage of information at the Foynes sea base that the unrest was coming to a head and that there was an impending strike in the Met Office. This gave cause for much concern to the Airport Manager, Colonel Maher who wrote to the

Establishment of the Meteorological Service in Ireland

Department seeking clarification. A letter was submitted to the Department by the Association regarding wearing uniforms and the matter stagnated until the appearance of the first Civil Aviation Circular in November 1943. Grants of £30 were to be given initially and £12 annually towards the clothing and, according to the Circular, rank markings were to be restricted to Airport Manager and the O.C. and his deputy in each station.

The staff still objected and they were prepared to refuse to use them but in a letter from to the Department in November the staff agreed to reconsider their attitude provided a suitable system could be arrived at. As no compromise was agreed, a letter signed by all the Committee in April 1944 submitted a definite refusal to wear the uniforms, unless satisfaction was obtained on all points. The development seemed to kill the official plan and it petered out subsequently.⁴

Social Aspects of Life in Foynes

Apart from the adverse working conditions, there is little doubt but for many it was difficult to adjust to the ethos of a small rural town. This was compounded by the lack of adequate and suitable accommodation and other facilities. Foynes was a typical country town which had its festival nights and dances. Conditions there 'were great for some', particularly those who were fortunate enough to live there. The athletic type participated in local team sports of hurling, football or rugby. Met Forecasters, and senior grades in Radio and Control, could afford the social club with its poker and solo card games, snooker, and the added

⁴ In 1944 the Airport Manager and Chief Control Officer appeared in dark blue double-breasted uniforms with lavender coloured stripes on the sleeve (Irish Air Letter, 1985). Dixon (unpublished) writes: 'The question of uniform had been raised before 1943. Even in 1939 pilots complained that they could not pick out the forecasters in the crowded room: the smartest looking was liable to be an assistant. And the staff attitude changed when clothes rationing became strict. It ought to be mentioned that some uniforms were supplied and that P.M.A. Bourke wore his for his marriage.' See photo section showing Austin Bourke in uniform.

Office and Social Conditions in Foynes

advantage of access to extra rations of cigarettes and liquor. Lack of adequate accommodation, however, led many to live some distance away in neighbouring towns and villages and in Limerick city. Daily travel to Foynes, particularly from Limerick city, coupled with long duty hours at Foynes (often 13 hour stints) was stressful and not conducive to social life.

The one and a half years spent at Foynes, according to P.V. Kelly, was ‘the worst part of his life’ (personal comm., 2010). Equally, non-Irish staff found difficulty mixing socially except with the relatively few Anglo Irish families. Neither did Shane Tierney easily take to the place – a progress report to HQ from his (1940) training course supervisor writes ‘Tierney has acquired a great dislike for Foynes and life there...he seems to look forward to his departure from this town as a convict does to his day of release’. However, it must be said that Tierney subsequently fitted well into the life of the town and its social club. Dixon (IMS-50) wrote ‘I was luckier than most in that I lived in Ardanoir Hotel ... more luxurious than the lodgings of my colleagues’. Yet some thirty years earlier, Dixon (1957) was perhaps unreasonably dismissive of the place when he opined ‘Some of the details of living and working conditions in that early period of the Shannon Airport in Foynes are best forgotten’.⁵

⁵ A quote from a short reference to Foynes given in a wider presentation on Meteorology and the Community delivered to a Dublin meeting of the Statistical and Social Society of Ireland, 1957. Dixon was more at home in Georgian Dublin! Dixon was also a keen photographer; some of his photographs of the Foynes era are reproduced in this publication.

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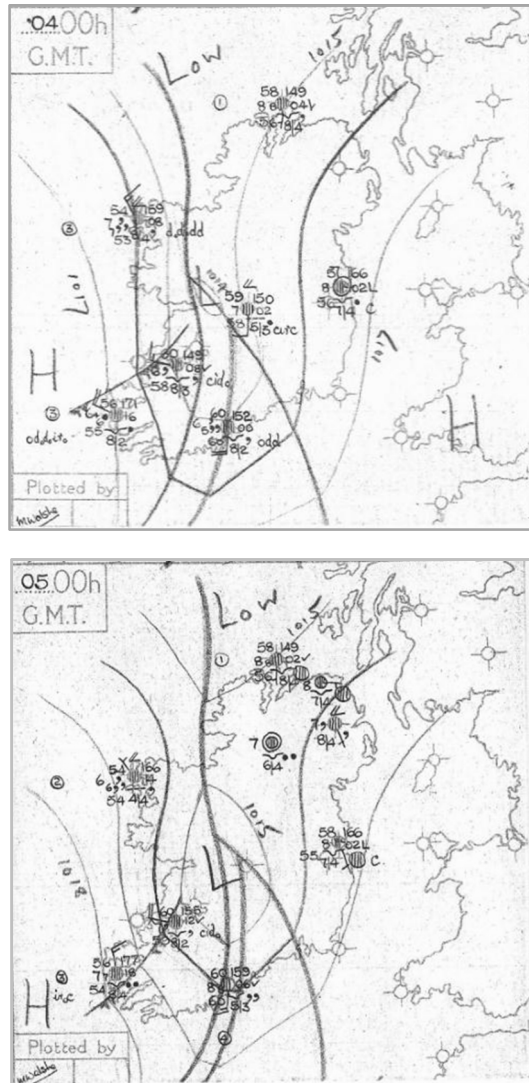


Fig. 4 Irish synoptic weather reports for 0400 and 0500 GMT on the morning of July 28, 1943 at the time of the Sunderland G-AGES crash into Slieveglass, Mount Brandon. This copy was plotted for the subsequent enquiry by Mick Walshe and the complex frontal pattern was analysed by H.H. Lamb. Note the progressive deterioration in visibility and cloud base as daylight broke at Foynes (full sky, ceiling 600 ft. (8/3)) to 300 ft (8/2)). By 0600 GMT cloud had lowered further.

IX

Developments in 1943 and 1944

Operational changes in Foynes

In anticipation of another busy year at Foynes additional staff were attached to the Met Office there in February 1943, including five additional Clerical Officers (see for example Slattery, Appendix X). A rearrangement of the ancillary duties took place with the arrival of these Clerical Officers. Plotting duties by Communications Officers began in February and special lectures on the technical background were given by Hubert Lamb and Paul Brown. By May 1 plotting of the Atlantic charts was taken over by the Clerical Officers. Tender launch observing duties for Assistants were instituted on March 9.¹

A meeting of Met Officers was held by the O.C. in May where future developments at the office were discussed. These developments included the introduction of plotting of medium level cloud by the forecasting staff, the introduction of the plotting of flight plans and aircraft position reports, and the institution of a new Analysis Section in the Met Office. Two series of charts were plotted and analysed from June 1.

In the year from August 1942 to July 1943, Foynes handled over 1,400 aircraft and 15,000 passengers (Irish Air Letter, 1985). In a typical three-week period some 37 flight movements took place and aircraft were often anchored for one or two nights due delayed

¹ As the anemograph was on a hill on Foynes Island, observers went over by launch to change the chart.

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departures probably often needing reissue of the meteorological flight documentation. Because the preparation of the flight forecasts was up 30 per cent on 1942, it was necessary to transfer forecasting staff from Dublin Airport to Foynes to relieve to some extent the heavy pressure of work on the forecasting staff. Met Officers Gillman and McNamee and Clerical Officer Murray reported to Foynes on June 1, 1943.

As a result of the withdrawal of staff from Dublin Airport a skeleton organisation was introduced there and a 24-hour forecasting service became impossible. The reduction in staff at Dublin Airport necessitated an appreciable curtailment of the supply of meteorological information to the Defence Forces and certain other authorities in 1943. The situation gradually became more acute culminating in the withdrawal of all forecasting staff at the end of January 1945 discontinuing completely forecast services from there except to the Air Corps.

Civilian Air Mishap on Mount Brandon

Relatively few flying boat losses occurred during the war years – one had been lost, for example, in the southern Atlantic route out of Bermuda and another aircraft accident occurred on landing at Lisbon. The northern Atlantic route had not had any such. On July 28, 1943 tragedy struck Foynes when the BOAC Sunderland aircraft, G-AGES from Lagos and Lisbon crashed into Slieveglass on the northern side of Mount Brandon at 0430 hours GMT killing 10 instantly (including Captain Allitt) of the 25 on board. Only twelve days previously a BOAC Frobisher aircraft, G-AFDK, had been wrecked, without loss of life, on landing at Rineanna from Whitchurch (Bristol) and Hendon.

The BOAC G-AGES aircraft was Foynes' sole fatal mishap, weather being a contributory factor.² Flights from Lisbon to Foynes were undertaken at night in order to avoid enemy fighter craft. Before leaving Lisbon the flight crew had been briefed as normal on the locally

² Also see Footnote 2, page 114

Developments in 1943 and 1944

prepared (Lisbon) analysis, and on the forecasts prepared at Foynes and at Gloucester, England, which were both consistent. This overnight flight from Lisbon, aided by a tailwind, arrived 30 minutes early and circled over Kerry Head awaiting dawn and frontal low cloud to lift from the Shannon estuary. However, being low in fuel, it was cleared to land at 0400 GMT. It appears that the aircraft had drifted off course unaware that in the meantime the wind over sea had abated or changed direction from SW to NW.

Foynes Met Office had responsibility for the meteorological protection of aircraft on this route since 1941. An immediate investigation was undertaken by the Meteorological Service into the various possible contributory causes of the accident. A conference on the meteorological circumstances of the crash and on the apparent forecast failure was held in the Meteorological Service Headquarters on Sunday, August 1, 1943. In attendance were Austen Nagle, Mariano Doportto, Hubert Lamb, O.C. Foynes Met Office, and Kilian Rohan, duty forecaster on the night of the accident. Reviewing the route forecast issued from Foynes at mid-day, and a later amendment at 18 hrs prior to departure from Lisbon, neither was deemed to have been a cause of the crash.

The primary focus of the review group turned to landing conditions due to the retardation of the cold front. This frontal system had been expected to be east of Foynes by arrival time at 0430 hours GMT and followed by improved weather spreading from the west. While a lower cloud base at Foynes might well have been forecast, yet it was thought this would not have affected the departure of the flight in Lisbon.

The official meteorological weather observations at Foynes between 0300 and 0400 GMT reported winds veering from south by southwest to west by north; the base of predominant low level Stratus cloud decreased from 1,800 feet to 900 feet and the visibility was 6-12 miles in intermittent slight drizzle. Conditions did not fall below TASSO day minima until one hour after the expected time of arrival. The weather as estimated by the observer in the Control Launch near the landing area at 0405 GMT was: cloud ceiling at 350 feet, visibility 6 miles and a

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Force 4 West wind. Subsequently, the cloud base continued to lower and was reported as 200 feet at 0600 GMT.

The SW air current at Valentia Observatory at 0030 GMT indicated to the duty forecaster Kilian Rohan on that night that the warm front had not yet occluded. His statement for the BOAC enquiry went on to say that until 0230 for the final leg of the route 'weather conditions were not expected to be different, in the sense that would make them operationally significant, from the final forecast sent to Lisbon. From then on there was no danger of the aircraft not being able to reach Foynes, owing to a change of wind conditions, and the question of landing at Foynes was of supreme importance. As the usual alternate landing places were considered unfit (weatherwise)...after 0230 I instituted closer watch on actual conditions at Foynes, and the actual reports were sent to the aircraft in accordance with T.A.S.S.O.' (AVIA 2/2344, NA, London).

The deduced weather conditions (determined for the crash enquiry) in the region between Foynes and Brandon between 0400 to 0500 GMT on the morning of July 28 was that of NW winds, 15 knots at the surface and 30 knots at 2,000 feet, intermittent rain or drizzle, generally light, visibility between two and six miles depending on precipitation, and cloud crossing the area from the northwest with base lowering from 1,000 feet to 200 feet. In any valley lying across the wind cloud may have been between 200 feet and the level of the ridge to windward (see Fig. 4).

Arriving via the Loop Head Corridor, Shannon Radio received a message 'landing in 45 minutes', which they interpreted to wait further daylight. The cause of the crash seemed due to a navigational error of 11° drift to port instead of an expected 13° drift to starboard 'homing' from westwards while awaiting daylight in poor weather conditions. A 'night effect' error reading (accentuated at sunrise) in the on board radio direction finding instruments was also thought to have been a contributory factor (AVIA 2/2344, NA, London).

Developments in 1943 and 1944

Following the internal review, Nagle issued a notice to staff referring to inadequacies at station understanding regarding issue of updated forecasts, serious shortcomings in preparation of meteorological flight watch messages at launch level and a need for a supervisor to be present at all stages of daily routine.

Flight Movements through Foynes

Much of the considerable increase in flights at Foynes in 1943 was especially due to business of the Poole-Shannon to Lisbon route. According to a Nagle report, for the year as a whole, the total number of flight movements through Foynes (and Rineanna) rose by some 16 per cent on 1942 to 1,568. The number of Previs and flight forecast folders prepared were up by a similar percentage to 2,037. Although the number of separate flight folders issued amounted to 628 as against 514 in 1942, nevertheless, the number of flights concerned with Foynes Met Office was thought to be not as great in 1943 as in 1942, the decline being due largely to landplane flying to and from Rineanna (which had concrete runways by the end of 1943). There, two or three or more aircraft habitually operated on the same forecast, a fact that was not apparent in the number of forecast folders prepared, in which respect 1943 was the record year. Somewhat at variance with the above, the Foynes Harbour Log shows 1943 as busier than 1942 by about 40 per cent (see bottom line added to Meteorological Services in Table I).

Nagle in a 1943 memo to the Department of Defence wrote: 'The rapid development of international aviation in Ireland during the years 1937-1943 has necessitated considerable attention to the aviation side of the work of the Meteorological Service. As this development was mainly in an entirely new field of regular trans-oceanic flying, in which meteorology is the predominating factor, a new and elaborate system for meteorological protection of such operations had to be devised and perfected, a task of some magnitude. This new system of meteorological protection was evolved mainly by the Irish Meteorological Service and is incorporated into the Trans-Atlantic Air

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Services Safety Organisation... At the request of the US Civil Aeronautical Administration the specification of the system in the fourth edition of the Trans-Atlantic Air Services Safety Organisation was arranged so that it could be adopted in toto, after the war, as the detailed international regulations for trans-oceanic flights. The Meteorological Office at the Shannon Airport now provides a service for aircraft operating over 10,000 miles of routes between Shannon and the United Kingdom, Lisbon, North and West Africa, Bermuda, the United States and Newfoundland and is working daily with eleven forecasting centres at the other airbases involved in these routes' (See Appendix IX).³

Some of the more familiar names of captains of aircraft operating Foynes on the Atlantic route during those years were: Capts. Craig, Fordyce, Gray, Kelly-Rogers, Blair, James, Martin, Hixson, Masland, Hart, Mathis, Frost, Thompson and McLoughlin.

The Trans-Atlantic Committee

In order to secure more effective dispatch of business between Foynes and Headquarters a committee was formed within the Meteorological Service in July 1944, called the Trans-Atlantic Committee. This committee comprised the DMS, Austin Nagle; Dr Doport, with title Superintendent of Synoptic Meteorology at Foynes (but attached to HQ); Hubert Lamb, O.C. at Foynes; and Dermot (J.) O'Connor, Secretary. Monthly meetings were held in Dublin, the first meeting taking place on July 7, 1944. A broad range of topics was discussed at

³ An issue arose on the night of August 26/27, 1943, as a weak wave depression (of tropical origin) was forecast near great circle track in mid-west Atlantic by both Met Offices Foynes and Dorval, Canada. Rejuvenation of the storm caused Dorval to amend forecast 'in alarming terms'... 'causing panic in Gander'. The duty forecaster at Foynes took exception to Shannon Control taking on itself to recall a PAA westbound flight without recourse to the Met Office, Foynes, noting a preceding AEA flight arrived safely ahead of schedule in Botwood (W.S. 44/4).

Developments in 1943 and 1944

these meetings as they affected the operations of the Met Office at Foynes.⁴

A report of work at Foynes for the previous month formed the basis for discussions at these meetings. A detailed account of the number of Previs and D (Determinate) flight forecasts issued to aircraft was submitted as a routine. In June 1944, for example, a summary of the report showed that the number of forecasts required for all routes was 138, while the number of successful flights reached 200 (a number of flights out of Rineanna usually went on the same forecast).⁵ There were 233 enquiries received in the office from Air Traffic Control and company personnel.

The supply of electric power was restricted during the war years and the restriction became more acute in 1944. In order to maintain continuity from one synoptic chart to the next in the analysis and forecast routines, well lit tracing slopes have been common features of any forecast room.⁶ In view of the electricity shortage an emergency lighting system, consisting of two 12 volt bulbs, supplied by a battery loaned from the Radio Section at Foynes, was installed during the month of June in one of the Forecast Room tracing slopes. Many of the electric light bulbs were removed, the remainder reduced to a maximum of 40 watts and the number of bulbs in each tracing slope was cut down from 8 bulbs to 3 apiece, leaving them under-illuminated. A partial relaxation of the restrictions in the use of electricity occurred in July 1944.

⁴ Of 27 flights to Newfoundland in June 1944, 23 per cent were cancelled or diverted due to bad weather.

⁵ In reply to a question in the *Dáil* (Irish Parliament) the Minister, Seán Lemass, stated that there were 666 arrivals and 678 departures at the Shannon Airport (Foynes and Rineanna) in 1944.

⁶ In the earlier years at least, electricity was supplied by a generator in the saw-mills adjoining the offices, of limited capacity (Dixon). Dixon went on to write '...Foynes seems to have been the first forecasting office to use (tracing slopes), he, Dixon, having suggested them, having had experience in tracing magnetograms in Edinburgh.'

Establishment of the Meteorological Service in Ireland

The Lamb and Brown Resignations

The continued stress on staff caused by the excessive and onerous workload caused much concern at the monthly Dublin meetings. At times there were some differences of opinion between the O.C. of Foynes and the DMS on the matter. Lamb felt that the earlier release of the then complement of professional staff at Foynes made it extremely difficult to maintain the existing analysis routine as well as the forecasting routine. The DMS thought that the professional staff complement was greater at Shannon (Foynes) than at other airports, La Guardia excepted, but that on the other hand the meteorological routine was more thorough at Foynes.

As a great number of the staff at Foynes were still inexperienced and could not be relied on to keep the analysis consistent in the absence of an Operations Supervisor, it was decided that the O.C. and his deputy help with the analysis. Also, as work on assistant duties was excessive, it was decided as a first priority that all work was to be performed even if this required the employment of professional staff on Assistant duties.

In the meantime, plans were going ahead in preparation for the next group of cadets whose training course was to start later in 1944. In order to release professional staff to train this next group of Meteorological Officer Cadets at Foynes and Valentia Observatory, and in addition, to start a training course for Junior Meteorological Assistants at Dublin Airport, Met Office Foynes was made responsible for the entire analysis and forecasting routine during the period of the course. Certain services at Dublin Airport were temporarily suspended.

The additional work load at Foynes was creating great hardship for the staff, already overburdened. At a committee meeting at Headquarters in August 1944 Hubert Lamb was of the opinion that the overtime then worked at Foynes was excessive and that it was responsible for the number of sick absences. He also put forward that travelling from Foynes to Limerick represented a hardship, particularly for officers on 12-hour duties between journeys. Rosters as then

Developments in 1943 and 1944

constituted, with frequent switches from night duties to day duties, he felt had a detrimental effect on staff health.

As regards sick absences, the Director did not entirely accept Lamb's point of view and believed that the cause lay more in the failure of staff to rest sufficiently during the off hours. Lamb replied that sick leave would have to be taken seriously 'and that the Meteorological Service could not afford to run onto the human scrapheap (young men) in their twenties, men who had been newly trained and from whom a lifetime of service might be expected'. Following this particular meeting, there was still much concern with the seriousness of the situation. Feeling that no redress had been achieved, both Hubert Lamb and his deputy Paul Brown subsequently tendered their resignations from the Service which the Director duly accepted.⁷

Before leaving Foynes, Lamb and Brown issued a joint notice to their staff on October 5, 1944 informing them of their resignation and going on to give their reason 'as we are not satisfied that either the measures we have been asked to put in force or the official handling of the affairs of the Office by the Directorate of the Irish Meteorological Service are in the interest of the forecasting work and the safe meteorological protection of flights'. An interesting side show took place in subsequent days in that Lamb had removed with him from the Foynes Met Office the latest minutes of the Trans-Atlantic Committee, a document normally classed as secret and thus restricted to the few. In a file Memo, Nagle questioned Lamb's motives and after some judicious phone calls, these were recovered, although annotated.

Hubert Lamb⁸ was posted to Dublin Airport and granted annual leave, returning for duty to Dublin Airport for his final day (October

⁷ According to Lamb (1997), Nagle and Doporto, 'who shared the same office... developed a common mind set which reinforced their entrenched positions to pleas from the outstations that the Service was taking on too many commitments.' In Lamb's view of things at that stage this extra work could not be undertaken without jeopardising the attention given to the safety of life on the trans-Atlantic flights.

⁸ Lamb went on to produce seminal studies and World Climatic classifications, and important Climatic Atlases – his study on North Sea Storms resulted in the building

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28, 1944) to comply with the regulations governing resignation. Paul Brown terminated his service on November 2, 1944.

On Lamb's sudden resignation Austin Bourke was promoted⁹ to the post of O.C., Met Office Foynes on October 14, 1944 and Shane Tierney was transferred there from Dublin Airport on a temporary transfer at first, but which became permanent on promotion to the rank of supervising M.O. Austin Bourke attended the Trans-Atlantic meetings on assumption of the duties as O.C., Foynes (Table 4). One of his first tasks was to undertake a major review of office routine and practices at Foynes. He presented, at his first meeting of the committee, a list of some 19 irregularities which were then occurring at the Foynes offices which he wished to correct. These included voluntary roster changes without O.C. approval, the pilot balloon routine had almost lapsed, office instructions were almost in a chaotic state and indications of favouritism or lack of care in dealing with staff including the mismanagement of new Assistants.

of the Thames Barrier. He became first Director of the Climatic Research Unit, University of East Anglia.

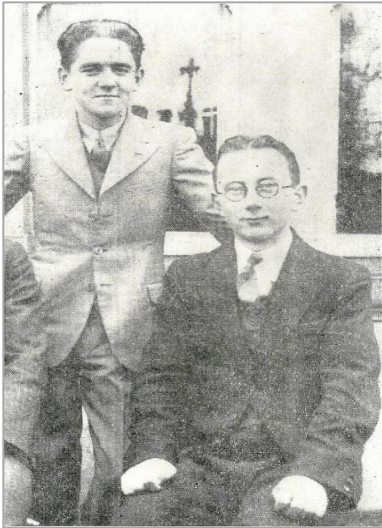
⁹ Bourke's promotion to Senior Meteorological Officer became effective on October 29, 1944 (see Appendix VI).



Relaxing on a sunny day off work from the Met Office, Foynes are from left: unidentified, Martin (Marty) Brennan, Kilian Rohan and Michael (Mickie) Keane. (photo: courtesy Michael Keane Junior)

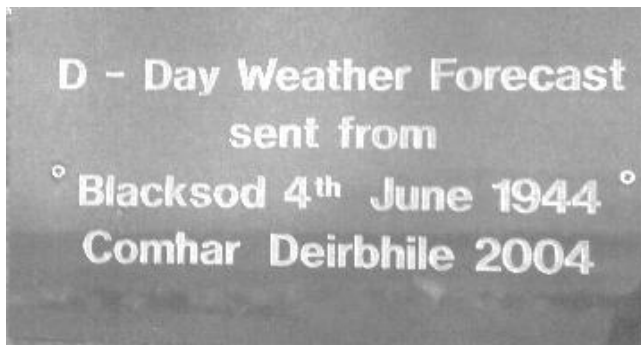


Left: On typing duties at Foynes Met Office are Mickie Murtagh and Fergie Hennessy (taken by Mickie Keane, photo courtesy of Michael Keane Junior). Right: Assistants Tony Duff and Paddy (P.V.) Kelly on a day off at newly opened station at Middleton in 1946. (Photo: late George & Breda Kelly)



Left: Michael (Mickie) Keane and Paddy Howley, students of the Christian Brothers Schools, Ennis on entry to the Meteorological Service at the Shannon Air Base at Foynes, March 27, 1939.¹

Right: Back: Tony Duff and Martin Brennan; Front: Jackie Parsons and Tadhg Brennan (inset), students of St Joseph's School, Fairview, Dublin who joined Met Service as Junior Met Assistants in 1944 (Photo: from Irish Independent).



Plaque placed on the wall of the Blacksod Lighthouse by the local Heritage Society (photo: Donal Shine, Belmullet)

¹The county newspaper - The Clare Champion - wrote: 'The two successful students are to be congratulated on securing 7th and 8th places in the competition open to all Ireland, especially as candidates for the positions included University graduates.' (Newspaper photo: courtesy Michael Keane Junior and the National Library)

X

Developments in the Meteorological Service

Climatological and Research Divisions

Since the foundation of the Meteorological Service, Austen Nagle had been anxious that the work of compiling Climatological Tables¹ and extracting climatological data for enquiries should be proceeded with as quickly as staff became available. Dr Leo Pollak, recruited in October 1939 for the newly formed Climatological Division, was initially posted there on entry to the Service.² After some six weeks he was reposted to Foynes in January 1940 to assist Peters in the preparations for, and with the training of, the second group of cadets, who were to enter the Service in March. Returning again to Dublin after some five months he resumed his post at HQ.

Investigational studies were also seen as important to the lifeblood of the Service and a strong research ethos was fostered among operational forecasters in their work environment. Arthur Morgan was transferred to HQ in 1940 in charge of Research and Development as well as the Instruments and Supplies Division. He also assisted Pollak to organise the Climatological Division (Dixon, IMS-50). A summary of the range of studies and research projects undertaken by forecasting staff at Foynes up to January 1944 is given in Appendix IV. Interestingly, Arthur Morgan, either when in Foynes or subsequently

¹ BMO continued publishing Irish Climatological Tables through the war years.

² 'Pollak planned (the Climatological Division) on modern lines with a thoroughly trained staff assisted by the most suitable calculating machines' (Dixon, 1957).

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attached to the Climatological Division, did not feature in this list. Another avenue pursued at the time was a serious proposal, made in 1943 and again in 1944, that Dunsink Observatory would be taken over by the Meteorological Service as its Central Research Division. This was not progressed by Government, however, and thus never came to fruition.

Observation Network Enhancement Programme

(a) Manning the New Division

In the reorganisation of Headquarters in 1939, Stephen Kelliher was transferred at the end of February 1939 from Valentia Observatory to a newly established Climatological Division. Tom Morley, as Senior Observer, was then put in charge of the Valentia station until the arrival of Hubert Lamb in March 1940 to take charge of the training courses soon to begin at the Observatory. Lamb's tenure at Valentia was in turn followed by that of Ignatius Lambert³ in mid-October 1940 (see Chapter V and Table 4).

Fred Dixon was posted to the Climatological Division in July, 1940 and made Inspector of Stations and later placed in charge of the Library.⁴ In this latter post he was assisted by Michael J. Finnegan.⁵ Further transfers to the Climatological Division were Junior Met Assistants Maurice Sheahan and Dermot O'Connor, November 1940,

³Lambert, who lived in the Observatory, didn't quite understand the Irish way of life and yet he had an interest in the Gaelic language and started a band for Irish music in the nearby town (Joe Graham, 1940 entrant). Another story goes thus: A weather observer attending to the Dines wind anemometer in Valentia Observatory inadvertently left the wind stop cock (valve) open until his next hourly inspection. Subsequently, Lambert queried the resultant hour-long singularity in the wind trace and, being assured by the observer as to the genuineness of the record, wrote to Dr Pollak a note on the phenomenon to which Pollak was heard to exclaim 'Mr Lambert has found a new law in physics, he has discovered the apex of a vortex' (Joe O'Brien, 1944 JMA entrant).

Developments in the Meteorological Service

and Ultan Egan and Des O'Connor, January 1941. ⁵ Tom Morley was also attached to the Division from its earliest days as well as a number of Writing and Clerical Assistants. Changes in the staff of the Division were frequent as personnel were often quickly withdrawn as more urgent needs arose elsewhere, for example at Dublin Airport. By February 1, 1942, there were twelve members in the Division including the O.C., one Met Officer, one Senior Assistant, three Junior Met Assistants, two Writing and four Clerical Assistants (Table 3).⁶

In addition to the routine work of the Division, principally the compilation of Climatological Year Book Tables, the Climatological Division was also charged with inspection and expansion of the network of Climatological and Rainfall Stations in the Irish State. Since his entry to the Service in 1937, Stephen Kelliher had already gained considerable experience in that field, having previously made a number of surveys in relation to setting up additional Telegraphic Reporting Stations throughout the country. The Air Corps provided a limited service at Baldonnell. Three new family run synoptic stations were added in 1943, i.e. Mullingar, Claremorris and Clones (closed in 1944 but reopened in 1950) (O'Connor, IMS-50; see Fig. 3).⁷

(b) Expansion of the Climatological Network

In the meantime considerable progress had been made to expand the network of rainfall stations. On assuming control in 1937 there were

⁴ (page 104) 'Nucleus of the library was presented by the British Met Office and by the Royal Met. Soc...other met services were also generous.... (Dixon, 1957)

⁵ Librarian/Translator with colourful history, Finnegan had a remarkable flair for languages and previously had been one of the first staff employed by Aer Lingus (IMS-50).

⁶ The first HQ communication found in the files with address 44 Upper O'Connell St., Dublin was dated June 16, 1941 although the Climate Section was not transferred there until August 21/22, 1942 (Dixon, Appendix XI).

⁷ Nagle's proposal to Department was agreed in July 1940 subject to recommendations by the Minister for certain families to be considered in Claremorris and Clones. Remuneration offered was £100 per annum. Hold up was due to Office of Public Works difficulties.

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some 165 rainfall stations in the Free State. By March 1942 this number had been increased to 256. "These new stations included several stations run by the *Gárda Síochána* at a number of barracks throughout the country. On his retirement in 1952, Kelliher had built the climatological and rainfall network from 200 to 800 stations (Smith, IMS-50). Throughout these early years some Climatological Stations were also inspected, including those at Rathfarnham and at Trinity College in an attempt to raise the standard of the stations.

(c) Monitoring of Weather Reporting Stations

The observations from Telegraphic Reporting Stations were also monitored, not only to ensure that standards of observation were maintained but also to ensure that defective instruments were replaced. Most minimum thermometers in use in 1941 were thought to be defective. A report was made on the standard of the observations and the errors made at Telegraphic Reporting Stations. Following the introduction of a new system of observing in December 1941 a check was maintained on the quality of reports from stations.

In a summary to the weekly short discussions on the work and organisation of the Climatological Division, first convened in December 1941, it was reported that Birr had a few discrepancies in their observations but that observers at Blacksod Point did not understand their work and that mistakes from there were frequent.⁸

Mistakes in Dublin Airport observations, it was thought, were more frequent than should be the case with trained observers; these were usually in the form of careless slips and omissions. Foynes was the best of the Telegraphic Reporting Stations while Malin Head was a bad station and few observations were reliable for climatological purposes.

⁸ Nagle informed the first Valentia Committee meeting (January 10, 1945) that sanction had been obtained for a Junior Met Assistant with an allowance to take charge at Elly Bay (~10 km north of Blacksod Point). Martin O'Herlihy recalled that there had been plans in 1939 that he and Barrow would go there. In the event a station was opened at Belmullet in 1956.

Developments in the Meteorological Service

The forms from Roche's Point were very neat, although the instructions were not being carried out as precisely as one would have wished. In a report on Valentia Observatory it was stated that the instructions were being carried out correctly, but that the anemograph was in a bad state. The Climatological Division was also concerned with the lack of uniformity in reporting precipitation.

(d) Inspection of Weather Reporting Stations

In his capacity as inspector of stations, Fred Dixon visited a number of these Telegraphic Reporting Stations. One such visit was made to Blacksod Point Telegraphic Reporting Station in February 1942. During the visit a detailed inspection of the station and of the observing procedures at the station was carried out. Dixon reported that the delays in transmission of the Blacksod Point observations were nearly entirely due to inaccurate clocks. He also concluded that the site was unsuitable for an anemometer due to bad exposure from the west and that estimation of wind force there was difficult due to the absence of trees.

Before Irish independence the telegraphic reporting station at Blacksod Point was operated by the Coast Guards providing observations every six hours. One coast guard remained on after 1922 but he proved unreliable and had taken to drink due fear of reprisal (Maureen Sweeney, personal communication, 2010)! Mrs Hughes (formerly Mrs Sweeney) of the adjoining Post Office took on the task assisted by her son Ted Sweeney. Coded hourly reports were made from early war time. These were telephoned to Foynes but later in the war years to Dublin Airport and onwards by teleprinter to Dunstable, UK.

Fred Dixon writes: 'Of all the observers at the station, Mrs Hughes, who was the oldest, was the most unmethodical...' Complaints had been made that the station reported CL=8 (clouded skies) too often but Dixon remarks 'while I was there such clouds were apparent almost every day.' Fred Dixon gave a number of lectures to the four observers

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there (probably included Ted's sisters, Francis and Margaret) and expected some improvement as a result. Making effective use of his photographic expertise, he included in his report of the visit a panoramic view of the environment in a mosaic of photographs.

Dixon's 1942 inspection of the weather station at Blacksod, and the series of lectures he gave to the observers there, may well have had greater historical significance than anticipated. Being on the north-western fringe of Europe, the station's weather reports played a large part in finally determining the date of the D-Day landings on 6 June 1944 ⁹ (also see Appendix III).

(e) Fred Dixon's other Duties

Fred Dixon, while still in the Climatological Division, performed regular forecasting duties at Dublin Airport on a once weekly basis after the withdrawal of the forecasting staff from there. One such temporary posting occurred in November 1943. As the duty started as early as 6 a.m., he regularly travelled to the Airport on the night before the duty and retired to the Met Office flat provided for the purposes. ¹⁰

New Cadet Training Course – The Valentia Committee

Seán McWilliams, Supervising Met Officer, was posted from Dublin Airport to Valentia Observatory, taking over from Lambert as O.C. of

⁹'D-Day' Blacksod Weather reports are often attributed to Blacksod Lighthouse (e.g. Kennedy, 2008). While Ted Sweeney was also a lighthouse keeper, his wife, Maureen Sweeney, confirmed to the author that these weather reports were made at the official meteorological station at the Coast Guard station cum Post Office, ¼ mile from the Lighthouse.

¹⁰ Dixon writes (unpublished): 'the full story should be told. It was essential to one of Mr Nagle's ambitious schemes. He envisaged that, when staff had been brought up to requirements, one senior forecaster would be scheduled as analysis overseer for a fortnight at a time. For the 14 days he would be continuously in the building, sleeping only for short stretches, and ensuring that there was perfect continuity in the analysis of each series of charts.' In fact, the flat was irregularly used by some staff on the early shift.

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the station on December 1, 1944 (Table 4). A committee, known as The Valentia Committee, was set up by the DMS to meet and review monthly the work of the Observatory. This Committee consisted of the DMS, the Superintendent of Synoptic Meteorology, Dr Mariano Doportto, O.C. of Valentia Observatory, Seán McWilliams, and DMS's personal assistant, Dermot (J.) O'Connor, Secretary. Meetings were held on a monthly basis, the first meeting being held on January 10, 1945.

No recruitment drives had taken place for additional staff since 1940 until 1944 (Table 2). A training course for Met Assistants had already begun in October 1944 (Appendix VII) at Dublin Airport which ended in December. These Assistants were posted to their various allotted stations. With respect to Valentia Observatory, following completion of the Dublin Airport course, the staff there was augmented to that of O.C. and 15 Met Assistants (1945, Table 3).

The third batch of forecaster cadets arrived into the Meteorological Service early in 1945. An elaborate training programme of three stages had been devised for them. Stage I was to be held at Valentia Observatory covering the Meteorological Assistant section of climatological aspects. It was Seán McWilliams' first major task to devise and then direct this course. Martin O'Herlihy was also transferred to Valentia Observatory to assist in the training course and to take charge of the Observatory in the O.C.'s absence. The group of Cadets consisted of Messrs Tom O'Callaghan, Declan Larkin, John Willie O'Byrne, Jim McMonagle and F. O'Shea.

The DMS directed McWilliams 'to pay particular attention to the cadets' notebooks and insist on a high standard of neatness and completeness..., recommended frequent verbal examinations of the class... (and) that Saturdays should be set aside for such verbal tests.' Seán McWilliams reported that there was a lack of boarding accommodation in the local town of Cahirciveen. While it was easier for the Cadets, who had regular hours, to acquire accommodation it was much more difficult, he felt, for those who were on rostered duties.

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This stage of the Cadet course lasted until June 22, some weeks later than May 1 as originally planned, and the young Cadets were then granted summer leave. Seán McWilliams was, in the meantime, also responsible for the training of Air Corps personnel at Baldonnel Aerodrome and he visited the aerodrome regularly on his attendances at meetings in Dublin. The next course for Assistants began at Valentia Observatory on July 17, 1945 (see Appendix VII).

Stage 2 on Weather Analysis and Forecasting was intended to take place at Foynes but was transferred instead to the Shannon Rineanna Airport. This course started on July 17 (see Chapter XI).



Rineanna Training Course 1945

Back Row: Tom O'Callaghan, Jim McMonagle, John William O'Byrne, Ingatius Lambert; Front Row: Fred Dixon, Shane Tierney, Declan Larkin (photo: F.E. Dixon; IMS-50)

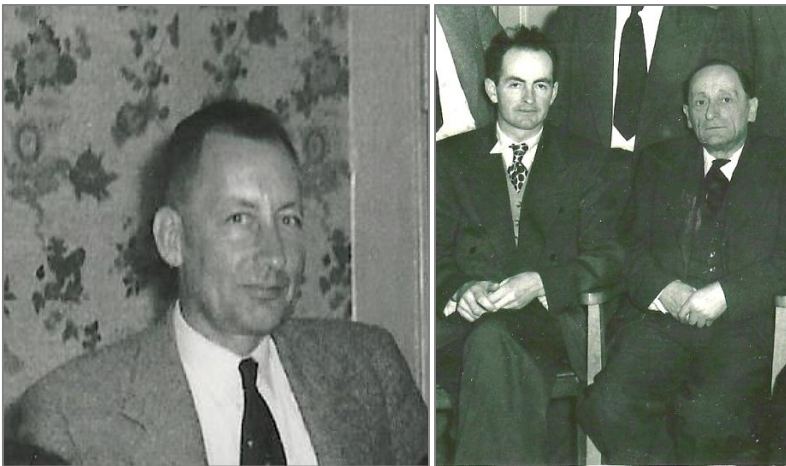


*A Douglas DC-4 taxiing along the runway at Rineanna, 16 September, 1945
(photo: F.E. Dixon archive)*



Forty years on (1978): Retirement day

*From left: Michael Keane, Andy Roche, O.C. Shannon Met Office Paddy Lyons congratulating Jackie and Mrs Staunton, John Doherty and Fergus Hennessy
(Photo copy: Paddy Lyons)*



*Fifteen years on (1960): Clerical Officers who worked at Foynes Met Office
George McCudden, Dick Slattery and Bill West (see Appendices VIII and X)
(from photo courtesy Elisha Heffernan (nee Slattery))*

XI

Foynes Era comes to an End

The Changing Scene in Perspective

In 1942 Rineanna was opened for commercial flights, thereby enabling passengers disembarking at Foynes to continue onwards by land aircraft to the major centres of population in Great Britain. The opening of the airport at Rineanna also offered the possibility of direct flights to New York by land aircraft at a later date. Many of the forecasting staff at Dublin Airport had already been withdrawn to Foynes in 1943 (see Chapter IX) but following calls from Aer Lingus to meet the demands of the upcoming Christmas increase in cross-channel flights, Fred Dixon was transferred from HQ to Dublin Airport on a temporary basis in November of that year. Dixon's transfer was made permanent in February 1944.

Following the resignations of Hubert Lamb and Paul Brown in October and November respectively, 1944, and soon after Austin Bourke's appointment as O.C. Foynes, Shane Tierney was transferred from Dublin Airport to Foynes on promotion as Supervising Met Officer. Seán McWilliams then assumed the post as O.C. Dublin Airport on October 28 (and promoted Supervising Met Officer on October 29, Appendix VI). On Seán McWilliams' departure to Valentia Observatory on December 1, 1944, Dixon assumed charge of the Met Office at Dublin Airport.

The latest reduction in the numbers of staff at Dublin Airport, in part caused by the necessity to carry out the training course for the

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group of cadets at Valentia Observatory (rather than at Foynes), which could not be done without assistance from Dublin Airport, necessitated that the office routine at Dublin Airport be transferred to Foynes. This routine included the issue of meteor telegrams, forecasts for Air Traffic Control, precipitation forecasts for the ESB (for the Shannon catchment), Marine weather forecasts for areas six and seven, Air Defence weather - the Curragh forecasts, and the Dublin Gas Company forecasts. These forecasts were thence available at Foynes on request only. Private enquiries for weather at Foynes were treated on their merits.

The Met Office functions at Dublin Airport were thereafter only as a reporting station, as a centre for the collection and dissemination of data and as an office for the distribution of Air Corps and Aer Lingus forecasts supplied by Met Office, Foynes. Staff remaining on at Dublin Airport with Fred Dixon were: Met Assistants: Michael J. Morley, Paddy Butler, Des O'Connor, Tommy Reynolds and Brendan Smith and Clerical Officers: Ernie Bonham, O'Brien, Paddy McKenna, Steve McSweeney, Ó Bríain, Ó Faoláin, Macken and Rex Gerrard. Some 200 flights took place from Dublin Airport in January 1945, nearly all to Speke (Liverpool) Airport.¹

The curtailment in meteorological services from Dublin Airport had been first proposed in the spring of 1943 but was effectively postponed due to strong intervention by the Department of Defence to the Department of Industry and Commerce.

Prior to Seán McWilliams leaving Dublin Airport, he directed the third training course for Junior Met Assistants which got underway on October 2, 1944. There were eleven assistants in this group (see Appendix VII for staff entering Service on October 2, 1944) and the course was completed towards the end of November. Some of the

¹ About this time the Air Corps was making renewed efforts to have meteorological staff assigned to Baldonnell because of its particular local climatological conditions. While Nagle supported the idea, he informed the Air Corps O.C., Major Delamere, that it was not an opportune moment to put forward the case (O'Malley, 2010).

Foynes Era comes to an end

Assistants were posted to Foynes on November 25 and a second group was later posted to Valentia Observatory on December 5. As the new Assistants became available it was hoped to introduce a 24-hour observation routine at Rineanna Airport with a complement of 5 Junior Met Assistants. Initially three had been sent to Rineanna to provide limited observations during the hours of flight operations.

Consequential changes due to the additional trained staff enabled Marty Brennan, Tony Duff and Paddy Howley to report to Rineanna from Valentia Observatory on February 2, 1945. To enable the introduction of night duty at Rineanna further changes were made in March with the posting there of Michael J. Keane, Frank Fitzgerald, Michael Murtagh and D. Rudden on exclusive Rineanna duties.

The Move to Rineanna

As the field of battle was further pushed back into Continental Europe following the allied invasion of the European mainland in June 1944, the North Atlantic was no longer the centre of combat. Security regulations governing the exchange of meteorological information were relaxed gradually. Warnings with regard to barrage balloons were dispensed with in November 1944. In April 1945, the transmission of the North Atlantic weather by the US and Canada from the American side and that from Foynes on the European side was made without encryption for the first time since the war began. Garda protection for the Met Office was discontinued. Ciphers for the secret encoding and decoding of weather messages were no longer required and the final sets in use were removed to HQ on June 1, 1945 and later destroyed there.

Meteorological support for flights at Foynes was reviewed and a met procedure for each separate route Shannon to Dublin, Dublin to Liverpool and Shannon to Croydon was introduced. Scheduled flights through the combined airports continued to increase. Since 1941, the trend was for increased landings at Rineanna, while sea-plane landings

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at Foynes quickly reached a more or less steady state. In 1941 some 4 per cent of the meteorological guidance provided by Met Office Foynes was for aircraft using Rineanna. This figure jumped to 33 per cent in 1942 but eased again in 1943 to 19 per cent, largely due to a halt in the shuttle flights from the United Kingdom to Rineanna from September onwards. While figures from January to May 1944 are not available, for the remainder of the year 49 per cent of the met guidance was provided for aircraft using Rineanna. This figure rose to 55 per cent in 1945 but here again the figures are slightly distorted due to the abrupt fall off in the use of Foynes towards the end of the year.

Towards the end of the war it became clear that the future of aviation lay with land based aircraft. Scheduled trans-Atlantic flights from Rineanna took place for the first time in October 1945 with some 10 round-trip flights during the month. This number increased to 40 round trips in November, at a time when trans-Atlantic flights out of Foynes usually tailed off. In December the figure increased to 64 round trips. The last scheduled flight out of Foynes occurred on October 29, 1945 - there were occasional flights in 1946 but the airport was run down.²

In the changed circumstances it was decided to move the Meteorological Office from Foynes to Rineanna in 1945. As the offices in Rineanna were not expected to be ready in time to receive the five new Met Officer cadets expected from Valentia Observatory in July they were to be sent to Foynes, but in fact they were posted directly to Rineanna. Definite information was received from the Department that the transfer of the entire meteorological operations to Rineanna would take place by November 1. In the meantime, because flying boats were still using Foynes the meteorological staff had to be divided between the two airbases.

² An unscheduled flight, October 1947, by the *'Bermuda Sky Queen'*, delayed at Foynes due strong Atlantic headwinds, took off unexpectedly on a by then out-dated weather briefing folder and ditched mid-ocean near weather ship 'C', all 69 on board rescued.

First Training Course at Rineanna

Shane Tierney, who appears to have returned for a short time to Dublin Airport, moved back to Foynes as O.C. on June 20, 1945, but then moved to Rineanna within a month.³ Stage 2 of the forecaster cadet training course was to begin at Rineanna on July 17. Fred Dixon, who had previously been transferred to HQ from Dublin Airport to prepare to assist with the training, was to be Tierney's aide. The scheme now envisaged that theoretical and practical training would continue in Rineanna. Arrangements were as follows: Austin Bourke acted as course director⁴ and also gave special lectures, e.g. on TASSO; Shane Tierney lectured on forecasting based on Petterssen⁵ and Chromow; and Fred Dixon was responsible for Dynamical Meteorology and Classwork, using Haurwitz and Brunt as textbooks. Stage 3 on Atmospheric Electricity, Ozone, Magnetism, Statistics, etc. was to be given overwinter 1945/6.

The lecture part of the scheme made slow progress but the cadets had ample practical experience of plotting and analysing charts. Dixon in a report to Dr Pollak wrote: 'the four (O'Shea had resigned by then but Lambert was to complete his training) Cadets are all promising material, bright and willing to work and learn.' A remarkable outcome of this training course, it has been said, that it never finished! Although lectures eventually covered the syllabus the cadets never underwent the normal examination.

Both Tierney and Dixon performed duties at Rineanna similar to those Austin Bourke and Tierney had previously performed at Foynes. Rineanna was made responsible for forecasting for shuttle flights and all

³ Interestingly, the Valentia Committee as late as its May 30 meeting expected that, following Annual Leave, the Cadets would report at Foynes on July 17. Rohan (IMS-50) states 'in October 1945 all operational staff and all but a few meteorological staff were transferred overnight to Shannon.'

⁴ Bourke's other roles vis-à-vis Tierney, his junior, is unclear, but it seems Tierney may have acted as operations O.C.

⁵ See, for example, reference to Sverre Petterssen re D-DAY in Appendix III.

Establishment of the Meteorological Service in Ireland

flights originating there. By February 1946 the transfer from Foynes to Rineanna had been accomplished although hourly weather reports continued to be made at Foynes until July 1, 1946.

Recruitment to the Meteorological Service continued apace during 1945. Apart from the February Meteorological Officer cadet entrants already discussed, nine Junior Meteorological Assistants were recruited in July, i.e. S. Ó Broin (John Byrne), P. Mac Ruairc (P. O'Rourke), D.S. Ó Briain (Donnacha O'Brien), S.P. Ó Faith (Seán Fay), P.A.C. Ua Mianáin (Frank Meenan), S.U. Ó Ceallaigh (George Kelly), R.A. Mac Lochlainn (Ray McLoughlin), Brian B. Farley and D. Ó Báille (Denis Bailey). This Assistant course was the only Assistant course given by McWilliams at Valentia Observatory. Over the years O'Rourke, O'Brien, George Kelly and Ray McLoughlin moved on to other careers. A further four forecaster cadets, i.e. T.J. Lee, K.G. O'Brien, J.B. Broderick and T.T. Carey were recruited in October but these too quickly left.⁶

⁶ All of these forecaster Cadets left the Service within a short time of completing their training, e.g. T.T. Carey became Professor of Mathematics and later President at University College Cork and John Brendan Broderick went to the aircraft industry in Birmingham before returning to join the Central Statistics Office, Dublin eventually becoming Assistant Director.

Epilogue

In the Foynes Flying Boat Museum literature it is claimed that Foynes was ‘The Centre of the Aviation World 1939-1945’. While this may appear overstated, nevertheless, due to a combination of circumstances ‘The Foynes Era’ deserves a unique place in the history of aviation and that of aviation meteorology. Throughout the WW II years the major carrier transiting Foynes was the British Overseas Airways Corporation (BOAC); Pan American and American Export Airlines arrived later in the war years. Traffic through Foynes gradually built up after 1940, reaching a peak in 1942 and 1943 - it has been estimated that, in the 12 month period August 1942 to July 1943, some 1400 aircraft transited Foynes (Aviation on the Shannon, Irish Air Letter, 1985; also, Appendix IX). Together with Communication and Air Traffic Control Services, the Irish Meteorological Service, and in particular the weather personnel at Foynes, played a key role in the safe passage of Atlantic flying boat traffic during that time.

The Foynes era developed gradually from 1937 and ended rather abruptly by December 1945. The professionalism achieved there presaged the establishment of Rineanna as a transit land base hub and major Irish aviation weather centre serving a great number of European and North American land air carriers on trans-Atlantic routes in post war years and subsequent decades.

The number of international carriers using Rineanna (now Shannon Airport) between Europe and America rose sharply in the early 1950s. To meet associated expansion in the meteorological workload, and in the Dublin Airport operations, the Meteorological Service embarked on a series of recruitment drives in the late 1940s and 1950s. While on-going Assistant grade recruitment adequately met the Service’s expanding needs, recruitment and training of forecasters was a slower process. To overcome these difficulties, some Assistants were sent to university and forecasters from abroad were employed on 2-year contracts. At its peak in the early 1950s some ten expatriate forecasters were serving at Shannon, amounting to some half of forecasters on roster duties. These

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forecasters mainly came from meteorological services of the US Weather Bureau (27), Canada (1), Germany (3), Spain (3), Italy (1), Portugal (2), Switzerland (1), and Norway (2, one of which, Kare Breivik, joined the Service fulltime). Other work taken on by the Service from 1948 was the issue of radio and newspapers forecasts, heretofore issued from the BMO, and expansion in the 1950s of the synoptic observation network operated by Meteorological Service personnel.

Throughout the 1950's, piston engine aircraft (DC4, DC6, Lockheed 749) operated on the North Atlantic. Limitations of the operating range of these aircraft necessitated stopovers at Shannon for refuelling. Due to the location of Shannon, there were a large number of emergency stopovers at this airport. Unfortunately there were also seven crashes (1946-'61) in this area with many fatalities.

In 1959, long range jet aircraft, e.g. Boeings 720 and 707 and the DC8 began operating on the route diminishing the need to use the airport as stopover. Staff could be released for other duties, e.g. a new Central Analysis and Forecast Office was opened in Dublin in 1961 to serve commercial life, radio, newspapers and TV.

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Table 1:- Number of Flights requiring Meteorological Services at Foynes (including those landing at Rineanna) between 1937 and 1945 (Met Service report to Dept of Industry and Commerce, 1946)

Month	Year								
	1937	1938	1939	1940	1941	1942	1943	1944	1945
Jan.						-	121	-	47
Feb.	Local Test Flights					-	84	-	73
Mar.						70	115	-	58
April						60	147	-	53
May					10	79	109	-	137
June			1		17	129	123	200	173
July	6	7	21		49	149	130	207	219
Aug.	5			11	75	181	153	203	225
Sept.				9	27	191	143	176	213
Oct.				7	48	160	118	113	176
Nov.					35	104	113	68	164
Dec.					30	124	98	-	226
Total ¹	11	7	22	27	291	-	1454	-	1764
Rineanna ²					4%	33%	19%	(49%)	55%

¹Compare with Table A (Appendix IX) compiled from flight movements at Foynes by Berry (2005). ² Estimated percentages of meteorological services devoted to Rineanna flights (page 114). Also see notes on Tables.

Table 2:- Number of Staff in the Meteorological Service at the beginning of each Calendar Year

Year	Grades			Total
	Officers	Assistants	Others	
1937	1	0	3	4
1938	2*	9*	4	15
1939	3*	9*	3	15
1940	16*	17*	13	46
1941	18*	29	18	65
1942	17	31 ^a	31	79
1943	17	31	34 ^b	82
1944	20	31	49	100
1945	18	48	45	111
1946	22	56	48	126

Establishment of the Meteorological Service in Ireland

**Table 3:- Allocation of Staff within Irish Meteorological Service
(At year beginning)**

Year	Director's Office	Inst. and Supplies	Climatology	Shannon (Foynes) Apt	Dublin Airport	Valentia Obs.	Training
1937	4						
1938	4			4*		7*	
1939	5			4*		6*	
1940	6		2	15*	2	5*	16
1941	8		7	20*	3	10*	17
1942	10		11	33	17	8	
1943	11		12	33	19	7	
1944	18		12	43	15	12	
1945	10	10	12	50	12	17	
1946	9	13	12	55*	15	15	7

Notes on Tables:-

Blank spaces indicate no flights took place; a dash '-', information not available.

In Table I, the Meteorological Service and Harbourmaster figures largely differ in that the meteorological services rendered were both for landing and take-off, repeated services to delayed flights, and flights at Rineanna.

* Figures with an asterisk include staff on loan from other Meteorological Services, or in the case of Valentia Observatory where staff was not yet regraded into the Irish Meteorological Service. Slight differences in Tables with script may be due to different reference timing. The jump in officer numbers from 17 to 20; 1942-43 (Table 2) is not documented and unclear (see App. VI.) 'Officers' include Director, Asst. Director, Senior Meteorological Officer, Supervising Met Officer, Senior Met Research Assistant and Meteorological Officer or equivalent ranks in other Services.

"Assistants" include Junior Meteorological Assistants and equivalent ranks in other Services.

^a Of the 31 Assistants in the Meteorological Service in January 1942 only four were on the then married scale (Civil Service Marriage Differentiated Scales, *Dáil Éireann* Reports, Vol. 92, March, 1944).

'Others' include Clerical Officers, Writing Assistants, Typists, Messengers, etc., but not Cleaner or Domestic.

^b Some 20 were COs on cipher and communication duties (Chap. IV, App. X).

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Table 4:- Officers in Charge of main Meteorological Centres

Year/ Centre	Valentia Observatory	Foynes (Shannon)	Dublin Airport	Climatology
1937	Capt. H.F. Jackson; from 1/10/'37 S.G.G. Kelleher	S.P. Peters (i)	-	-
1938	“	“	-	-
1939	from 1/3/'39 T.J. Morley	“ (ii)	- (iii)	<i>from 1/3/'39 S.G.G. Kelleher; from -/10/'39 Dr. Pollak (for 6 weeks)</i>
1940	from 1/3/'40 H.H. Lamb; from -/10/'40 I. Lambert	“	-	<i>from -/5/'40 Dr. Pollak</i>
1941	“	from 7/1/'41 Dr. M. Doportto; from 19/9/'41 H.H. Lamb	from 19/9/'41 Dr. M. Doportto (iv)	“
1942	“	“	“	“
1943	“	“	from -/6/'43 Dr. Doportto to HQ (v)	“
1944	from 1/12/'44 Seán McWilliams	from 14/10/'44 P.M. Austin Bourke	from 14/10/'44, H.H. Lamb; 28/10/'44, Seán McWilliams; 1/12/'44, F.E.Dixon	“
1945	“	20/6/'45 – 15/7/'45, Foynes: Shane Tierney; Rineanna: Austin Bourke (vi)	Shane Tierney 20/6/'45, M. J. Morley (vii); 10/12/'45, F.E. Dixon	“

Notes:

- (i) 1937/'38: Over-winter caretaker O.C., S. Proud
- (ii) 18/5/'39: Air Corps services to Rineanna begin
- (iii) 13/9/'39: Observations begin at Dublin Airport (M. O'Herlihy; C. Barrow)
18/1/'40: Dublin Airport first flights
- (iv) 1/12/'41: Dublin Airport becomes Irish Met. Communications Centre
- (v) 1/12/'43: Dublin Airport no longer provided with a 24-hr duty forecaster
- (vi) Austin Bourke was also Director of the cadet training course at Rineanna
- (vii) Fred Dixon transferred to HQ and later to Rineanna to prepare for, and assist with, the cadet training course.

Appendix I

Confidential Meteorological Code and Emergency Arrangements

Security Arrangements at Foynes questioned

In December 1941 the matter of the security of the Met Codes was raised. This followed a purported remark by a member of the Office of the British Representative, Dublin following a visit to Foynes, which questioned the adequacy of the Met Office security arrangements. T.J. Flynn, Assistant Secretary, Department of Industry and Commerce, having 'no idea how question arose', wrote as follows to Assistant Secretary F. H. Boland, Department of External Affairs setting out the security arrangements at Foynes:

I have received a letter of the 31st ultimo regarding the British codes at Foynes. We have from the outset fully appreciated the importance of the safe keeping of these codes and have arranged complete measures for their protection. Until recently there was a military guard at the Airport Offices themselves. For certain reasons this guard had to be temporarily withdrawn but it is now being reinstated. During the present interim period the system of protection is briefly:-

The coding room where the codes are kept is connected by direct telephone line to a military post, garrisoned by mobile troops, 2 miles from the Airport Offices. Every fifteen minutes throughout the twenty four hours the military post calls the code room and enquires if all is well. The reply is given by a code word which is changed every day. If the appropriate reply is not forthcoming the military turn out.

There is only one free entrance to the Airport building. During hours of daylight a verification officer is on duty in a hut along the path to the entrance to examine the credentials of anyone desiring admission; the Airport staff are provided with identity cards and no other person is admitted unless vouched by some authorised person. The names and business of all such occasional entrants are logged together with the time of entry and exit from the Airport and they must be escorted throughout the period in the Airport building by some member of the staff. In the hours of darkness armed detectives patrol the entrance and verify the credentials of all persons approaching the airport building. In addition,

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patrols at irregular intervals throughout the night are carried out by the military.

Equipment is kept ready to hand in the Meteorological Office at the Airport for the immediate destruction of the codes and other secret material in the event of an acute emergency. This would be either (a) on receipt of certain code words from the military or (b) at the discretion of the O.C. Meteorological Office. In order to provide for (a) either the O.C. Meteorological Office or his deputy, who are the only persons aware of the special code words, is always on duty in the Airport building (sleeping quarters are provided for them for this purpose).

Specially selected staff are employed as Coding Officers and at least two such officers are always on duty in the coding room throughout the 24 hours. The senior Coding Officer on duty at any particular time is personally responsible for the code books which are kept in a safe, the keys of which are kept by this Coding Officer. The books are removed only for actual use by him and his Assistant and after use, they are replaced in the safe. At every relief the keys and code books are formally handed over to the incoming man who examines and signs for them. No visitors, and only specially authorised members of staff, are admitted to the Coding Room.

With the reintroduction of the military guard the system outlined above will continue unchanged except that, during the hours of daylight, the verification officer will be covered by a detective with the remainder of the guard within call and that, during hours of darkness, the sentry will replace the armed detectives and will hold up all persons approaching the Airport for identification by a member of staff summoned by a bell installed for this purpose. (This was the system in force before the interim scheme of protection by armed detectives).

I think it will be generally agreed that the above system of protection is very thorough and optimum; theft or copying of the codes without knowledge of the staff is quite impossible.

Perhaps when the opportunity presents itself you will ascertain from Archer¹ what started this hare. We had always understood that the various

¹ Reference to Archer may have been to N.E. Archer, Principal Secretary, Office of the British Representative in Dublin, or, more likely due familiarity of the remark, to Col Liam Archer, Director of Military Intelligence, Air Corps, 'who functioned as the main point of contact between the Irish and British military during the Emergency' (O'Malley, 2010).

Appendix I

representatives of the United Kingdom Air Ministry and Meteorological Office who visited Foynes from time to time were fully satisfied with the arrangement we had made. It would be no harm if, in your reply, you stressed our extreme carefulness in safeguarding the codes from the time we get them.'

In the meantime in January 1942 the Minister for Defence in a minute to his Chief of Staff enquired on the feasibility of providing military protection. In an effort to keep the British on side in providing us with increased data Nagle wrote to the Defence Forces in July seeking a reversal of the order to withdraw guard at Foynes where four secret codes were kept (1 BOAC; 2 British Air Ministry; and 1 Meteorological Service). However, full guard was not mounted again until October 14.

Security of Meteorological Information and Military Internee

In a letter to the Secretary of the Department, July 1944 Nagle wrote on a matter relating to an internee military meteorologist, who when out on parole, had contact socially with one of the professional staff from Met Foynes. Conversations had touched on technical matters, and while there was no question of revealing data 'as everyone clearly understands the need for secrecy', rather the concern was that the internee might have contacts with his own countrymen and Nagle was not so sure if staff understood what deductions could be made from such conversations.

Nagle sought guidance in relation to policy. He thought that owing to geographical and other circumstances we have a special relationship with one group of belligerents (United Kingdom and United States) and that such relationship should be confined to the smallest possible number of people in case it got a wider circle. He also sought approval for loaning meteorological books to the said internee which could be applied for through his Camp Commandant.

O'Halpin (1999) reports Austin Bourke as saying that the internee was a Luftwaffe Meteorologist, and added: 'Much secrecy surrounded the dispatch and receipt of these (weather) messages, but (that) the weathermen involved were under no particular security injunction beyond the standard civil service warnings not to disclose details of their work.'

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Appendix II

Meteorological Services provided to Aircraft by Met. Office, Foynes

Previs for the flight section, Pembroke to Shannon (Foynes), and Progs giving landing conditions at Shannon were prepared for incoming flights from Pembroke.¹

Previs for the route and Progs giving landing conditions at Shannon were prepared for incoming flights from Lisbon and for over-flights, Lisbon to Poole.

Pilot Meteorological Reports were prepared for outgoing flights Shannon to Poole and Shannon to Lisbon.

Pilot Meteorological Reports were prepared for outgoing flights Shannon to Newfoundland (Botwood), and Shannon to New York.

Forecasts for the second half of the route and landing conditions at Shannon were prepared for flights Newfoundland to Shannon and New York to Shannon.

Pilot Meteorological Reports were prepared for infrequent flights Shannon to Lough Erne, and Progs of landing conditions at Foynes, for flights from Lough Erne to Shannon.

Progs giving landing conditions at Rineanna were prepared for flights of land planes Whitchurch to Rineanna.

Pilot Meteorological Reports were prepared for flights Rineanna to Whitchurch.

Progs giving landing conditions at Rineanna and Pilot Meteorological Reports were issued for return flights Rineanna to Dublin Airport. A number of these forecasts were also phoned to Rineanna.

Meteorological Reports were issued or phoned to Rineanna for Air Corps flights from Rineanna, mostly to Baldonnel.

¹ PREVIS depicted the expected weather conditions through the proposed flight path in pictorial format whereas the forecast landing weather conditions were known as PROGS. In later years the entire folder, route and landing conditions became known as PROGS.

Appendix III

Blacksod Weather Reports and D-DAY, June 6 1944

The scarcity of meteorological reports from the North Atlantic during World War II meant that the weather reports from the station at Blacksod Point on Europe's most westerly peninsula became particularly important to deciding the date of the D-Day landings, code named operation OVERLORD, in June 1944. The Blacksod station at the end of the Belmullet Peninsula in north Mayo was operated for the Irish Meteorological Service by Mrs Hughes and her family (see Chapter X).

Allied Forces Supporting Weather Services

As the invading Allied forces each had their own separate meteorological advisers, an independent coordinator was appointed to provide a coherent weather brief to the Allied Command under its Commander in Chief, General Eisenhower at the SHAEF¹ base at Southwick House, Portsmouth. This was critical in the days prior to D-Day so that differences and inconsistencies in map interpretation between weather offices were ironed out before each formal presentation to the Joint Chiefs of Staff. Group Captain J.M. Stagg^{2/3} was appointed to the task of 'getting a measure of agreement' between the three forecasting Centres, namely, United Kingdom Forecast Office (Dunstable), the US Naval Base (Portsmouth) and those of US land and air forces (known as Widewing, Teddington⁴). Scrambled telephone conferences between the forecast

¹ Supreme HQ of the Allied Expeditionary Force

² Stagg, after some US objections to his being a civilian, was drafted into the army and given rank of Group Captain for the purposes of allowing him attend D-Day Commanders' weather briefings (also see Footnote 4, Chapter V)..

³ In August 1940, Stagg representing the British Met Office, with 'several bigshots' flew into Collinstown. Next day accompanied by Nagle, Tim O'Driscoll (from the Department) and Dixon, flew on to Rineanna (getting lost on the way until O'Driscoll identified the Rock of Cashel) for organisational talks at Foynes (Dixon, unpublished notes).

⁴A US meteorologist, responsible of the Upper Air Section at Widewing, Capt. Robert Bundgaard, is reputed to have visited Valentia Observatory early 1944

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offices were held prior to each consensus briefing by Stagg to the Commanders' conferences held three times daily.

Meteorological Situation

At the beginning of June 1944, the weather over northwestern Europe was dominated by a ridge of high pressure extending from the Azores. This deflected a series of very active frontal depressions northeastwards exiting the North Atlantic between Iceland and Scotland. Associated fronts weakened over Ireland. At that stage the weather prospects over the English Channel were good for landing craft and troops in France. D-Day was provisionally fixed for June 5. But very soon this optimistic outlook faltered and by June 2, the British and US weather forecasters disagreed on the likely outcome. The US forecasters maintained faith in the dominance of the ridge of high pressure while the British were 'unmitigatedly pessimistic' on the likelihood of cloud and strong winds over the Channel (Stagg, 1971). Thus, Stagg felt that, despite the fall of the barometer reported from Blacksod Point in west Ireland being not serious, he could not reconcile the opposing views.

While no great change in the situation was thought to have occurred on the morning of June 3 from the previous evening, Stagg, however, was alerted when the Dunstable forecaster (the eminent Norwegian meteorologist Sverre Petterssen serving in the British Met Office during WW II), referring to the movement of an Atlantic low, said that Blacksod Point had just reported a force 6 wind and rapidly falling barometer.

Stagg noting this important information added 'I think I could have reached over and shaken his hand if Petterssen had been on the other side of a conference table instead of about a hundred miles away at the end of a telephone.'⁵

probably in relation to the Radio Sonde upper air programme carried out there. (Source: John Ross, referring to a recent communication he had with Bundgaard who it seems declined to expand on the objectives, citing military secrets). Ross (jross@crosslink.net) is also studying Ireland's meteorological role in D-Day).

⁵ Surprisingly, this was the last specific mention of Blacksod by Stagg in his publication 'Forecast for Overlord' (1971). Further references consisted of statements on developments to the west or over Ireland. For further mention of Blacksod, see 'Guarding Neutral Ireland' (Kennedy, 2008).

Appendix III

The emphasis switched to finding a window of improved weather conditions sufficiently long enough to allow the invasion to proceed. Thus reports from Blacksod and Valentia Observatory remained extremely important in the tracking of developments and in forecasting the duration of an approaching post frontal ridge behind the low pressure area to the NW of Ireland.

24-hour Postponement

The 1300 GMT weather reports on June 3 showed that a warm front had reached Blacksod. With the prediction of a slow retreat of high pressure, low cloud and wind would still dominate in the Channel on June 5. Eisenhower postponed Operation OVERLORD for twenty four hours, those craft already on their way being recalled to port. The Blacksod report at 1300 GMT on 4 June indicated the arrival of a cold front on the west coast of Ireland. The Commanders' conference of that evening was told that there had 'been some rapid and unexpected developments in the situation over the Atlantic (Kennedy, 2008) and there existed a good 'prospect of a fair spell setting in after the passage of the cold front'. At 0200 on 5 June 'the Irish reports were not considered to be disconcerting'... 'The clearance following the front reached the west coast of Ireland by the early morning on June 5 and was over Portsmouth by 0400 (although weather improvement was slow)'.

US meteorologists noted in their diary just how central reports from Blacksod had become to Allied weather planning. During the morning briefing on 5 June, Capt. Smith entered the conference room with the latest report from Blacksod. It confirmed the passage of a cold front there at approximately 1200 hours (4 June). With the verification of the report that the front was passing through Ireland, complete confidence was then restored in the subsequent development of the basic process. However, Allied reports stated that 'the pressure rises at Valentia and Blacksod were still very slight' (AIR 37/1124 A; Overlord Weather, per Kennedy, 2008).

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The following extract is taken from a 2002 report in the 'Western People' quoting from the late Ted Sweeney in 1994:

'I was sending an hourly report for the 24 hours day and night. It had to be phoned into London.⁶ We got a query back. They asked for a check. 'Please check and repeat the whole report'. I went to the office and checked the whole report and repeated it again. I just wondered what was wrong. I thought I had made some error or something like that. They sent a second message to me about an hour later to please check and repeat again. I thought this was a bit strange so I checked and repeated again...It never dawned on me that this was the weather for invading or anything like that. When I checked the report, I said thanks be to God I was not at fault anyway. I had done my job and sent over a correct reading to London.'

⁶ Blacksod weather reports were telegraphed through to Dublin Airport since December 1941 and protocol would have it that queries from Dunstable (UK) on any observation would have come back via Dublin Airport. However, Ted Sweeney's wife, Maureen, (over 90 years of age in 2014) clearly recalls being the one to receive the phone enquiries back, the first within two hours of the 1 am observation time; she understood the calls were from London as the person on the other end was female and had an English accent (both reasons for ruling Dublin out). The reason for this unilateral bypassing of Dublin can be well imagined, i.e. a quicker and more direct reply and less people knowing of the sensitive request; Met UK would have had the Blacksod phone number to hand from former years.

Appendix IV

Studies and Investigations of the Irish Meteorological Service to January 1944

Already published

- (1) Bourke, P.M.A. On the Practical Determination of Height from Upper Air Data, U.S. Monthly Weather Review, Oct. 1940. 2pp 1fig
- (2) Doporto, M. The Computation of Atmospheric Pressure at the 8 Km level of Constant Air Density, Irish Met Service, Tech. Note No.1
- (3) “ Dynamical Aspects of the Constancy of Air Density at 8 Km, Irish Met. Service Tech. Note No.2, 66 pp, 15 figs
- (4) Dixon F.E. Fog at Irish Lighthouses and Lightships 1916 1938, Irish Met. Service Memo 1/43 pp 3, 2 figs
- (5) “ The Discoverer of the Symmetry Points in Pressure, Quarterly Journal of the Royal Met. Soc., 1941, 1 p
- (6) Pollak, L.W. A Graphical Method of Evaluating Pilot Balloon Assents Bulletin American Met. Society, Nov. 1941, 3 pp, 1fig

Awaiting publication

- (7) Brown, P.R. Note on Local Conditions at Poole Airport
- (8) “ An Example of the 24-hour, 12-hour and 8-hour Pressure Oscillation in an Anticyclone in Temperate Latitudes
- (9) Bourke, P.M.A. Vertical Mixing and the T- Φ diagram
- (10) “ Forecasting for Ireland during easterly non-frontal situations
- (11) “ Ice Accretion on Aircraft
- (12) Dixon, F.E. An experimental covered sunshine recorder
- (13) Doherty, H.B. Regular and irregular diurnal variations of pressure: 12~hourly, 8-hourly and 24-hourly periods
- (14) Doporto, M. The calculation of aircraft ground speeds for long-distance flight forecasts
- (15) “ The probable latest times of clearance of fog and low cloud at Foynes during the period October to February
- (16) Gillman, C.J. A graphical method for computing the heights of Isobaric surfaces

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Awaiting publication (cont.)

- (17) “ A graphical method for calculating pressure at 10,000 ft.
- (18) Lamb, H.H. Cold Front structure: Some Aircraft Observations
- (19) “ The Development of a method of Estimating and Forecasting winds at 10,000 feet over the N. Atlantic
- (20) “ A Transformation from Warm to Cold Occlusion
- (21) “ Smoke Sources and Visibility
- (22) “ A Vertical cross-section through the Atmosphere over Rineanna, Co Clare
- (23) “ A Study of Isopleths of Upper Air Temperature over Aldergrove
- (24) “ Flight conditions over the N. Atlantic in August and September 1942
- (25) Leech, L. Preliminary report on the constancy of air mass properties as revealed by isopleths of upper air temperature
- (26) “ The occurrence of fog & low cloud at Foynes in summer
- (27) Pollak, L.W. Schedules for Harmonic Analysis
- (28) Rohan., P.K. A Check list for Forecasting Winds
- (29) Tierney S.L. The occurrence of non-frontal fog and mist at Dublin Airport from October to February
- (30) “ Air Mass Frequency over the N. Atlantic Ocean

Meteorological Service Publications

- (31) Met. Service Wind and water conditions at Rineanna
- (32) “ Magnetic observations at Valentia, 1940-2
- (33) “ Ozone observations at Valentia, 1940-2

Investigations in Progress

- (34) Ice formation in the atmosphere over Ireland
- (35) Cell-motion in the Atmosphere
- (36) The construction of isobaric charts for the first isopycnic level in the atmosphere
- (37) The quantitative forecasting of day maximum and night minimum temperatures
- (38) The vertical structure of the atmosphere as revealed by radio soundings at Valentia Observatory, Co. Kerry

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- (39) The development of a photoelectric nucleus counter
- (40) The use of radio-location of atmospherics in Atlantic forecasting
- (41) The forecasting of winds at 25,000 feet over the N. Atlantic Ocean
- (42) The long range forecasting of annual and monthly rainfall in Ireland
- (43) Quantitative methods of differentiation between degrees of intensity of precipitation
- (44) Local meteorological conditions at the Dublin Airport associated with the passage of fronts
- (45) The correlation between pressure and temperature in the upper atmosphere
- (46) Variations in lapse rate in the vicinity of the tropopause
- (47) Meteorological influences affecting the outbreak and spread of acute anterior poliomyelitis
- (48) Meteorological conditions at the Synoptic Reporting Station and at the aircraft alighting area, Shannon Airport Foynes

American Weather Studies – reviewed and adapted for Foynes purposes

- No.1 Travel of a warm sector of NP_p across the N. American continent
- No.2 Orographic effects of the Rocky Mountain Barrier
- No.3 Frontolysis and Frontogenesis over the N. American continent
- No.4 The absorption of a continental Depression by an Atlantic Depression over Newfoundland
- No.5 An Outburst of Continental Polar Air extending to the Gulf of Mexico

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Appendix V

British Agency Staff who served various (broken) spells with the
Irish Meteorological Service

Name	Grade	First Posting	Final leaving Foynes
S.P. Peters	Senior Technical Officer	15/2/'37	6/3/'41
J. Harding	Technical Officer ^a	15/2/'37	-/12/'39 ^b
S. Proud	Technical Officer	15/2/'37	-/9/'39
Harrower	Technical Officer	15/2/'37	n/a
C.D. Barrow	Technical Assistant III	6/4/'37	3/5/'40
E. R. Jackman	Technical Assistant III	5/4/'37	2/5/'40
K.D. Fraser	Technical Assistant III	6/4/'37	-/10/'38
W. Harper	Bermuda Met. Service ^c	13/4/'37	- / - /'37
N.E. Davis	Bermuda Met. Service ^c	13/4/'37	- / - /'37
D.A. Davies	Technical Officer	16/6/'38	26/8/'39
H.H. Lamb	Technical Officer	24/7/'39	31/5/'40 ^d
H.F. Jackson	Technical Officer	1/4/'37	2/10/'37 ^e
N.N. Wilson	Technical Officer	-/10/'38	over winter

^a Technical Officer, i.e. Forecaster

^b Transferred to Dublin Airport before returning to Britain (p.42)

^c on training experience ending with the 1937 flying season

^d Transferred to IMS, see Append. VI

^e Jackson, who was in charge of Valentia Observatory since January 3, 1934, remained on until the Observatory was transferred to the Meteorological Service on October 1, 1937.

Also, Egyptian trainee meteorologists, Gidamy, Ali and Firesah, were attached to Foynes for a time during 1939.

Appendix VI

Professional Appointments in the Irish Meteorological Service up to 1945

Name	Rank	Date of Appointment
A.H. Nagle, A.R.C.Sc M.Sc., D.I.C.	Director	8/12/1936
P.M.A. Bourke, M.Sc.	M.O. Cadet	16/1/39
	Met Officer (M.O.)	16/1/41
	Supervising M.O.	1/2/44
	Senior M.O.	29/10/44
P.R. Brown, A.R.C.Sc. M.Sc., D.I.C.	M.O. Cadet	26/1/39
	M.O.	26/1/41
	Supr.M.O. (Acting)	1/2/44
	Resigned	2/11/44
W.A. Morgan, M.Sc.	M.O. Cadet	16/1/39
	M.O.	16/1/41
	Supr. M.O.	1/2/44
J. McWilliams, B.Sc.	M.O. Cadet	16/1/39
	M.O.	16/1/41
	Supr. M.O.	29/10/44
S.L. Tierney, B.A., B.Sc.	M.O. Cadet	16/1/39
	M.O.	16/1/41
	Supr. M.O.	3/11/44
L.S. Leech, B.Sc.	M.O. Cadet	16/1/39
	M.O.	16/1/41
F.E. Dixon, B.A.	M.O. Cadet	3/3/39
	M.O.	3/3/41
L.W. Pollak, Ph.D.	Senior M.O.	30/10/39
M. Doportto, D.Phys.Sc.	Senior M.O.	21/11/39
M.G. Granville, B.Sc.	M.O. Cadet	11/3/40
	M.O.	11/3/42
P.K. Rohan, B.A.	M.O. Cadet	11/3/40
	M.O.	11/3/42

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Appendix VI (cont.)

Name	Rank	Date of Appointment
B. McNamee, M.A.	M.O. Cadet	11/3/40
	M.O.	11/3/42
C.J. Gillman, M.Sc.	M.O. Cadet	11/3/40
	M.O.	11/3/42
H.B. Doherty, B.A.	M.O. Cadet	7/5/40
	M.O.	7/5/42
H.H. Lamb, B.A.	Met. Research Officer	1/6/40
	Supr. M.O.	19/9/41
	Resigned	28/10/44
I. Lambert, B.A., M.Sc.	Sen. Met. Research Asst.	2/3/40
V.H. Guerrini, M.Sc.	M.O. Cadet	8/7/40
	M.O.	8/7/42
T. O'Callaghan	M.O. Cadet	1/2/45
	Resigned	?
J.W. O'Byrne, M.Sc.	M.O. Cadet	1/2/45
J.M. McMonagle, M.A., B.Sc.	M.O. Cadet	19/2/45
F. O'Shea, B.E., B.Sc.	M.O. Cadet	7/2/45
	Resigned	19/2/45
D.M. Larkin, M.Sc.	M.O. Cadet	2/2/45
T.J. Lee, B.E., B.Sc.*	M.O. Cadet	1/10/45
K.G. O'Brien, B.Sc.*	M.O. Cadet	1/10/45
J.B. Broderick, M.Sc.*	M.O. Cadet	1/10/45
T.T. Carey, M.A., Ph.D.*	M.O. Cadet	15/10/45

*All four resigned on/soon after completing the course.

Appendix VII

Junior Met. Assistant Appointments in the Irish Meteorological Service up to 1945

Name	Rank	Date of Appointment
S.G.G. Kelliher	Senior Met. Assistant	3/8/37
F. Hennessy	Junior Met. Assistant	27/3/39
J. Staunton	“	27/3/39
A.O. Roche	“	27/3/39
M.F. Murtagh	“	27/3/39
M.J. Keane	“	27/3/39
J.F. Doherty	Junior Met. Assistant	25/4/39
M.F. Sheahan	“	27/4/39
P. Howley	“	27/4/39
M. O’Herlihy	“	27/4/39
M.J. Finnegan	Translator (Jun. Met. Asst.)	1939/40?
M.J. Morley	Junior Met. Assistant	5/6/40
	(Formerly M.O. Clerk Grade II at Valentia Obs.)	
J. O’Connor	Junior Met. Assistant	1/7/40
J.O. Hardy	“	1/7/40
R. Mathews	“	1/7/40
J.M. Graham	“	1/7/40
J.D. Kelly	“	1/7/40
B. Smith	“	1/7/40
T. Keenen	“	1/7/40
U. Egan	“	1/7/40
J.O.G. McNamara	“	1/7/40
T. Reynolds	“	1/7/40
M. Keane	“	1/7/40
D. Keane	“	1/7/40
P. Butler	“	1/7/40
M. Walshe	“	1/7/40
D. O’Connor	“	1/7/40
T.J. Morley	Junior Met. Assistant	14/3/41
	(Formerly M.O. Clerk Grade III, Valentia Obs.)	
G. O’Sullivan	“	17/3/41
	(Formerly M.O. Observer at Valentia Obs.)	

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Appendix VII (cont.)

Name	Rank	Date of Appointment
M.O'Shea	Junior Met. Assistant (Formerly M.O. Observer at Valentia Obs.)	28/11/41
P.R. Nolan	Junior Met. Assistant	9/8/44
T. Brennan	"	9/8/44
D. Black	"	9/8/44
F. Fitzgerald	"	9/8/44
G.B. Leyden	"	9/8/44
N. McClean	"	9/8/44
T.D. Rudden	"	9/8/44
J.A. Jones	"	9/8/44
B. O'Brien	Junior Met. Assistant	2/10/44
M.A. Gannon	"	2/10/44
J.B. O'Sullivan	"	2/10/44
C.J. Beare	"	2/10/44
T.J. Ambrose	"	2/10/44
J. J. Parsons	"	2/10/44
M.E. Brennan	"	2/10/44
A.J. Duff	"	2/10/44
J.M. Nolan	"	2/10/44
P.V. Kelly	"	2/10/44
J. O'Brien	"	2/10/44
S. Ó Broin (John Byrne)	Junior Met. Assistant	16/7/45
P. Mac Ruairc	"	16/7/45
D.S. Ó Bríain	"	16/7/45
S.P. Ó Faith	"	16/7/45
P.A.C. Ua Mianáin	"	16/7/45
S.U. Ó Ceallaigh (George Kelly)	"	16/7/45
R.A. Mac Lochlainn	"	16/7/45
B.B. Farley	"	16/7/45
D. Ó Báille	"	16/7/45

Martin O'Herlihy and Michael Walshe left to take up positions as Flight Dispatchers with TWA, both probably in 1945 - P.V. Kelly (1944 entrant) recalls being on 'shadow duty', i.e. on the job training, under Michael Walshe.

Establishment of the Meteorological Service in Ireland

Appendix VIII

Clerical Officers serving at Foynes during WW II

Name	Native County
Mick Barrett	Dublin
Denny Lalor	“
George McCudden	“
Frank Murray	“
Jerry O'Callaghan	“
Harry Sullivan,	“
Mickie Walls,	“
Fergie Hall	Wexford
Frank O'Loughlin*	“
Tim Desmond	Wicklow
Jim Geoghegan	Galway
John Haslam*	Laois
Jim Barry	Clare
Michael McInerney*	“
Robert Emmet Anderson	Limerick
Barry Manton	“
Jack Sweeney	Donegal
Colm Jackson	Belfast
Bill West	Cameroon born
Tadhg Murphy	Macroom, Co Cork
Eamon McHugh	Roscommon
Dick Slattery	Kerry
Jim Harte*	?

* Supervisors

Appendix IX

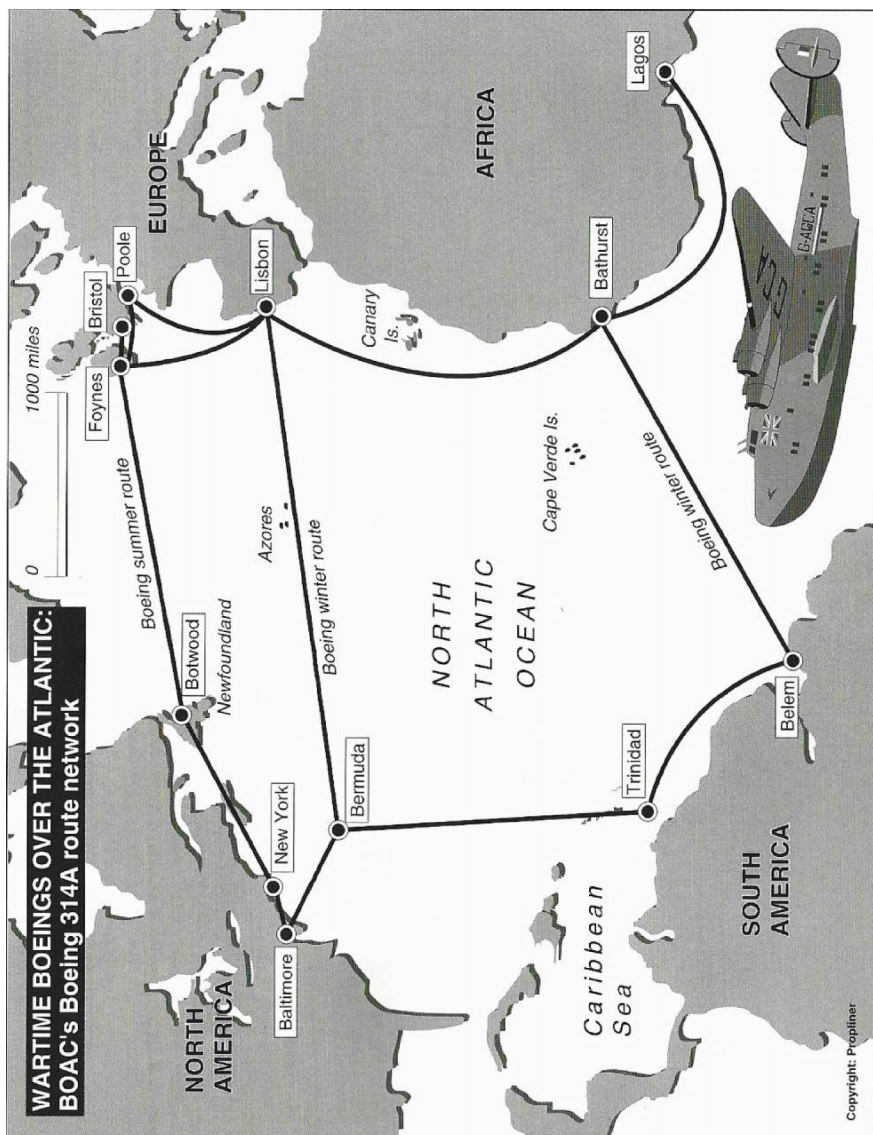


Fig. 5: Wartime Boeing routes over North Atlantic (Berry, 1996 (after Propliner))

Appendix IX

Summary of Flights through Foynes & other Irish Airports, 1939-1945

Seasonal flying boat traffic through Foynes during WW II years has been compiled from various sources mainly that of Wilson (2001; 2009) in his seminal work entitled 'Progress of Civil Aviation 1939-1945' (from documents in the library of the Civil Aviation Authority) and that of Berry (1996, 2002) in his compilation of daily flight movements as recorded in the Harbourmaster logbook at Foynes. Other sources consulted include 'Aviation on the Shannon' - An Irish Air Newsletter publication (1985). Table 5 provides a monthly and annual summary derived from Berry's reports. The last row, on the number of arrivals and departures combined, compares favourably with that of the meteorological services rendered to flights as given in Table 1 in the main text. Also Figure 5 depicts the southern and northern Atlantic routes taking Foynes (Shannon) as transit base.

1939:

Trans-Atlantic Services were operated by Imperial Airways Ltd between Southampton and New York, via Shannon, Botwood and Montreal, once weekly from August 5 to September 30, with the Short S.30 modified Empire flying boats *Cabot* and *Caribou*. Eight round trips were made, and all the journeys were completed without incident and a high standard of punctuality being maintained. Pan American Airways began to operate, at the end of June, a weekly service between New York and Southampton via Shediac (Canada), Botwood and Shannon, with Boeing 314 flying boats. On the outbreak of war, the Pan Am service was discontinued between Shannon and Southampton, a (shuttle service over this section being provided by Imperial Airways Ltd. when the demand warranted it. Pan Am ceased northern Atlantic operations in October not returning until May 1942.

1940:

For most of 1940 there was no aviation activity at Foynes. On April 1, 1940, Imperial Airways became British Overseas Airways Corporation (BOAC). Owing to the diversion to military purposes - the *Golden Hind*, *Golden Fleece* and *Golden Horn*, intended as Atlantic carriers, were taken over by the RAF - it was not possible to reopen the Atlantic Service in the early summer as had been planned. On suspension of the Mediterranean section of the Empire

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Service two Shorts S.30 flying boats were released for the North Atlantic service. Between August 3 and September 23, *Clare* made four round trips between Poole and New York, via Foynes, Botwood and Montreal, and *Clyde* made a fifth round trip over the same route, October 4 - 11. These services were not available to the public, as all the space on the boats was required for the conveyance of official passengers, dispatches and mails. Subsequently, BOAC closed down at Foynes for the winter.

Table 5: Monthly and Annual Totals of Flying Boat arrivals at Foynes, 1937-'45 (After Berry, MRAeS, 1996)*

	1937	1938	1939	1940	1941	1942	1943	1944	1945
Jan						14	32	26	10
Feb	2					13	18	23	13
Mar	1					24	38	19	10
Apr			1			15	39	16	9
May					5	31	38	28	36
Jun			3		6	38	45	41	39
Jul	6	3	8		16	45	61	45	60
Aug	5		18	6	15	54	68	42	62
Sep	3		18	4	4	58	69	40	57
Oct			4	3	15	35	61	39	35
Nov					10	35	51	13	5
Dec					9	37	49	11	1
Total (Arrivals)	17	3	52	13	80	399	549	343	337
Arrivals/ Depart's	34	6	104	26	160	798	1098	686	674

*As derived from the original data as extracted by Peter Berry, MRAeS, from the Foynes Harbour Master's Log. Data reproduced here by the kind permission of the author (See main Bibliography for reference to Berry's work on TASSO, 2005).

1941 Services:

With the fall of France, a BOAC service to Lisbon and west Africa was inaugurated in October 1940, with two S.30 flying boats (*Clare* and *Clyde*), and continued through 1941. Over winter it operated at approximately ten day intervals between flights while these two aircraft were in service. On February 15 *Clyde* was lost in a gale at Lisbon and the frequency was reduced

Appendix IX

until the PBY "Consolidated" flying boat *Guba* became available in March. Due to the acute shortage of aircraft available to BOAC, the British Government ordered six Boeing 314s which were part of a batch under construction for Pan Am. The first of these, *Bristol*, came through Foynes on May 22, 1941. Others, *Bernick* and *Bangor*, followed into service. In 1941, all flight services through Foynes were BOAC services.

From 12th October 1940, a number of flights on the Poole–Shannon–Lisbon – Gibraltar – Malta – Cairo were made with Short S.30 (C Class) and Consolidated Model 28 flying boats. The Poole–Shannon–Lisbon–Bathurst–Freetown–Lagos route operated ten return flights until May 25 and subsequently, with additional Boeing 314A flying boats, a summer service was operated on a once weekly basis. After October 30, the service ceased. Also a once weekly Poole – Shannon – Lisbon operated from May 26 to August 8 as Foynes became the northern terminal of the Boeing flying boats.

Atlantic winter crossings were serviced from October 30, 1940 on a circular southern route¹. Three flights were made with Boeing 314A flying boats. After a delayed start to the 1941 summer season due lack of long distance aircraft the northern route services, Shannon–Botwood–Baltimore, flights resumed on July 18. These operated with Boeing 314A flying boats approximately once every ten days.² After November 5, the service ceased.

1942 Services:

1942 was a busy year at Foynes especially augmented by the return of the American carriers to the North Atlantic route in May.

Overwinter Services: The UK - West Africa service, operated generally as in 1941 with the Boeing *Bangor*, *Bernick* and *Bristol* and joined in February by three Short S.30 flying boats, *Clare*, *Cathay* and *Champion*, and two PBY Consolidated flying boats, *Catalina* and *Guba*. A frequency of about three services per fortnight in the southbound direction, and about one per week northbound, was operated on Poole – Foynes – Lisbon – Bathurst -

¹ Shannon – Lisbon – Bathurst – Lagos – Bathurst – Belem – Trinidad – Bermuda - Baltimore – Bermuda – Lisbon – Shannon Note: westbound flights went further south to take advantage of the trade winds. As aircraft was away from base for 12-14 days the frequency was low.

² The Boeing 314A flying boats were intended primarily for the route to West Africa, but as they had to proceed back to Baltimore for overhaul after 120 hours' flying, flights to and from the U.S.A. constituted an intermittent trans-Atlantic service.

Establishment of the Meteorological Service in Ireland

Freetown and Lagos service while eight eastbound and seven westbound flights operated on the Poole-Shannon-Lisbon-Gibraltar-Malta-Cairo route. Operations ceased March 7. In addition, from February 27 to May 14, five return flights were made over the Foynes – Lisbon – Bathurst - Lagos section.

With the advent of winter conditions in Newfoundland in 1941/42 it was necessary to re-route the Atlantic Boeing flying boats to Baltimore across the South Atlantic. From October 30, BOAC operated an irregular service between Foynes and Baltimore with calls at Bathurst. Three flights were made with Boeing 314A flying boats. Operations consisted of a circular itinerary, Shannon (Foynes) to Shannon.³ Until May 14, nine round flights were made with Boeing 314A flying boats. Connection with Poole was made with the flying boat ferry services operating from Poole to Foynes.

With the return of the summer months, nine return flights were made by BOAC on the African route on the Poole-Shannon-Lisbon-Gibraltar-Malta-Cairo (ceasing August 11) and 17 southbound and 16 northbound flights were made on the Poole – Foynes – Lisbon – Bathurst – Freetown - Lagos route with Boeing 314A flying boats from May 15 to October 29. After October 29, the route formed part of the winter service. Also, apart from April 5 to June 15 (when operations were suspended) BOAC operated nine Poole-Shannon ferry return flights with Short S.23/30 and Short G class flying boats from February 12 until October 29.

North Atlantic 1942 Summer Services:

On May 15 summer routing of the Boeings was resumed operating in each direction across the North Atlantic via Newfoundland and Foynes. The frequency was increased to approximately twice weekly in each direction. On July 18, the two G class flying boats *Golden Hind* and *Golden Horn* were put on the service, and later in August it was further reinforced by the two PBY flying boats from the Mediterranean. By these means the frequency was increased for a time to rather more than three return services per week. From May 20 Pan Am continued to use Foynes through the war.

BOAC made 16 eastbound and 15 westbound flights on the Shannon - Botwood (Newfoundland) – Baltimore route from May 15 to October 29 with Boeing 314A flying boats. Connection with the UK was by the UK-Éire

³Foynes-Lisbon-Bathurst(Gambia)-Lagos(Nigeria)-Bathurst(Gambia)-Belem(Brazil)-Port of Spain (West Indies)-Bermuda-Baltimore-Bermuda-Lisbon-Foynes(Shannon)

Appendix IX

land services. Pan American Airways (Pan Am) operated from May 19 – October 18 a twice weekly schedule using Boeing 314 flying boats on the New York - Shediac (Canada) – Botwood - Foynes route. American Export Airlines (AEA), after initial survey flights, operated from June 22 a twice weekly passenger service using Vought-Sikorsky VS-44-A flying boats from New York – Botwood – Foynes, and three times weekly, August 21 - October 30. After October 30 southern route was used via British West Indies.⁴

1943 Services:

BOAC Southern Route Services: The Short S. 25 Sunderland replaced Empire boats on West African route. The Sunderland G-AGES accident also occurred at Foynes on July 28 (see Chapter VIII). 27 eastbound and 26 westbound flights were made from October 25 (1942) with Short "Sunderland" flying boats on the Poole - Shannon - Lisbon - Gibraltar - Djerba – Cairo route. Also from March 3 eleven return flights were made with Short "Sunderland" flying boats Poole - Shannon – Lisbon, operations ceasing on May 28. On the Poole-Foynes-Lisbon-Bathurst-Freetown–Lagos route 23 southbound and 27 northbound flights were completed to May 25 (using the Short G class and Consolidated *Catalina* and Consolidated *Guba* to March 23 and Short S.30 (C class) thereafter). There were 10 westbound and 11 eastbound flights made on the Trans-Atlantic circuit route⁵ overwinter until June 12. In addition, 11 southbound and 9 northbound flights were made over the Poole – Foynes – Lisbon – Bathurst - Lagos section.

Summer Schedule: Southern Route: BOAC had operated the Poole–Lisbon route directly twice weekly until May 25 with Short S.30 (C class) flying boats but reverted to Foynes from May 26 to August 8 and once weekly to October 30 when service resumed the winter route. Also on the Poole – Foynes – Lisbon - Port Etienne (French Mauritania) – Bathurst – Freetown - Abidjan*(Ivory Coast) - Lagos: 55 return flights were completed with Short "Sunderland" flying boats from March 1 to November 5, when operations ceased. From May 27 a BOAC shuttle service operated from

⁴ AEA, testing the southern side of the Gulf Stream just south of the rhumb-line, decided on a track, Bermuda direct to Foynes that yielded best results. 'The myth about North Atlantic invincibility in winter thus became a casualty of the war' (Capt. Blair, as quoted in the 1986 'An Irish Air Letter publication).

⁵ Poole – Foynes – Lisbon – Bathurst – Lagos – Bathurst – Belem - Port of Spain – Bermuda – Baltimore – Bermuda – Lisbon – Foynes - Poole

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Poole to Foynes making 61 westbound and 60 eastbound flights with Short G class flying boats augmented by Short Sunderland from August 16.

Northern Route: BOAC operated the direct northern Atlantic route, Poole – Shannon - Botwood – Baltimore, from June 13 to October 24. Some 12 return flights were completed with Boeing 314A flying boats. After October 24, 8 westbound and 6 eastbound flights were completed. Pan Am used a one direction only route⁶ throughout the year (with some minor changes), twice weekly, with Boeing 314 flying boats. AEA completed until July 3, 25 flights on its circular route.⁷ After October 22, ten flights were completed, otherwise regular service. From April 2, calls made at Port Lyautey (French Morocco), between Shannon (Foynes) and Bathurst; April 11 – July 3, calls to Port Lyautey between Bermuda and Shannon. Service operated with Vought-Sikorsky VS-44-A flying boats. From July 4 – October 22, twenty return flights with Vought-Sikorsky VS-44-A flying boats were on the New York–Botwood–Shannon (Foynes)–Port Lyautey (French Morocco) service.

1944 Services:

BOAC operated from Poole a twice weekly over-winter service until May 25 to Shannon and Lisbon, then once weekly to August 8 with Short S.30 (C class) flying boats. In addition some 9 westbound and 11 eastbound flights were made on the Poole-Shannon leg, January to February 18, with Short G class and Sunderland flying boats. On the southern Atlantic route (U.K. - Africa - U.S.A.)⁸, BOAC operated until May 6 and after October 29, once weekly in one direction, with Boeing 314A flying boats. In summer, May 6 to October 29, BOAC operated three times weekly (and an additional service approximately once every ten days, July 18 to November 5) on the route, Foynes - Botwood – Baltimore, with Boeing 314A flying boats. After D-Day, and as the war theatre moved to the European mainland, BOAC service

⁶ New York – Bermuda – Azores – Lisbon – Foynes – Lisbon – Bolama (Portuguese Guinea) - Fisherman's Lake (Liberia) – Natal (Brazil) – Belem – Port of Spain – San Juan-Bermuda – New York

New York – Bermuda (replaced by Botwood, May 28-July 3) – Foynes – Bathurst – Port of Spain (omitted July 4 – October 22) – New York

⁸ Poole* - Shannon – Lisbon – Bathurst - Lagos* - Bathurst - Belem* - Port of Spain - Bermuda – Baltimore – Bermuda – Lisbon – Shannon (Foynes) – Poole (*called on as necessary only).

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extended eastwards to Poole September 16 - October 29, now considered safe as terminal, although Boeings continued to transit Foynes.

Pan American Airways operated a twice weekly winter southern Atlantic one direction only⁹ until May 16, with Boeing 314A flying boats. From May 17 to October 24, service made no calls at Bermuda - 46 return flights with Vought-Sikorsky VS-44-A flying boats. Thereafter, the former route was resumed twice weekly. For example, in June there were 11 arrivals and three delays at Foynes due to either mechanical and weather factors. Pan Am also operated three times weekly from May 17 to October 24 the northern route, New York (USA) – Botwood (Newfoundland) - Shannon (Foynes), with Boeing 314 flying boats.

American Export Airlines also operated an over-winter one direction only Atlantic circuit¹⁰ until May 13 - twenty-two flights were completed with Vought-Sikorsky VS-44-A flying boats were made. Regular services resumed on May 14 to October 20. Thereafter, nine flights were completed.

1945 Services:

Winter Services: The dedicated BOAC Poole-west African special services no longer transited Foynes. Until February 18, there were 9 westbound and 11 eastbound ferry flights made on the Poole – Shannon route with Short G class and Sunderland flying boats. On February 18, this service ceased.

From October 30, 1944 BOAC made with Boeing 314A flying boats once weekly round trips until February 6, thereafter three times fortnightly until May 11, on the southern Atlantic route: Poole - Lisbon - Bathurst – Natal (as needs) - Belem - Port of Spain - Nassau - Bermuda - Baltimore - Bermuda - Lisbon – Poole.¹¹ From May 12 to October 17 the summer northern Atlantic route was used, thereafter, once weekly in one direction. (Note:

⁹ New York – Bermuda – Horta (Azores) – Lisbon (Portugal) – Shannon (Eire) – Lisbon (Portugal) – Dakar (Senegal) – Natal (Brazil) – Belem – Port of Spain (Trinidad) – San Juan (Puerto Rico) - Bermuda – New York.

¹⁰ New York – Bermuda (omitted during summer) – Shannon (Eire) – Port Lyautey (French Morocco) – Dakar (Senegal) – Bathurst (Gambia) – Belem (Brazil) – Port of Spain (Trinidad) – New York

¹¹ Three round flights were also made on the route: Shannon - Lisbon - Bathurst - Lagos - Bathurst - Belem - Trinidad - Bermuda - Baltimore - Bermuda - Lisbon – Shannon.

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From October 18, Nassau was omitted and Shannon replaced Lisbon eastbound).

Until May 17, Pan American flew twice weekly, with Boeing 314A flying boats, a circular circuit New York Shannon New York one direction only.¹² Subsequently to October 20 it routed New York – Shediac (Canada) – Botwood - Shannon (Foynes): May 18 – October 20, three times weekly.

American Export Airlines also took a circular one direction only route, New York Foynes New York (one direction only)¹³ with schedule of approximately once weekly until May 10 using Vought-Sikorsky VS-44-A flying boats. The summer schedule increased to three times weekly from May 1 to October 20. As from November 10, with company name change to ‘American Overseas Airlines Inc.’ it reverted to winter route.

Land Plane North Atlantic routes opened late 1945:

From December 2, Pan American operated New York– Gander (Newfoundland) – Shannon (Rineanna) – Lisbon: twice weekly with Douglas DC-4 landplanes. PAA commercial services were operated between the United States and the United Kingdom as follows: New York - Gander - Rineanna - Hurn: October 28 to December 3, twice weekly; thereafter, five times weekly, with Douglas DC.4 landplanes.

American Export Airlines (rebranded American Overseas Airlines Inc.) operated commercial services between the United States and the United Kingdom as follows:- (i) New York - Gander - Rineanna - Hurn: October 31 to December 25, twice weekly; thereafter, three times weekly, with Douglas DC.4 landplanes; (ii) New York - Boston -Gander -Rineanna - Hurn: From October 31, once weekly, with Douglas DC.4 landplanes; (iii) Washington - Philadelphia - Gander - Rineanna - Hurn: From December 4, once weekly, with Douglas DC4 landplanes; (iv) Chicago - Gander - Rineanna - Hurn: From 4th December, once weekly, with Douglas DC.4 landplanes.

¹² New York – Bermuda – Horta (Azores) – Lisbon (Portugal) – Shannon (Eire) – Lisbon (Portugal) – Dakar (Senegal) – Natal (Brazil) – Belem – Port of Spain (Trinidad) – San Juan (Puerto Rico) - Bermuda – New York (one direction only).

¹³ Winter: New York – Shannon (Foynes) – Port Lyautey (French Morocco – Bathurst (Gambia) – Belem (Brazil) – Port of Spain (Trinidad) – New York; Summer: New York – Shannon (Foynes) – Port Lyautey (French Morocco – Bathurst (Gambia) – Belem (Brazil) – New York (one direction only).

Appendix IX

UK - Dublin Airport and Shannon (Rineanna) Land Services

Aer Lingus (ALT)/West Coast Services and BOAC Foynes connecting flights

London (Croydon) - Bristol - Dublin

(1939): ALT once daily increasing to twice daily on weekdays from April 1. Service ceased with onset of WW II.

(1945): ALT from November 9, once daily on weekdays, with DC-3 landplanes and with Avro XIX landplanes from December 3.

Bristol - Dublin:

BOAC Services in order to provide connection with services operated out of Foynes:

(1940): a number of flights were made from July 4 with De Havilland DH.91 (F class) landplanes.

(1941): a number of shuttle flights were made from July 4, with De Havilland D.H. 91 (F Class, *Frobisher*) landplanes to connect with services operated from Shannon (Foynes). Between July and October, a frequency of three flights per fortnight in each direction was achieved on the service.

(1942): After February 21, 1942, Shannon replaced Dublin as the Irish terminal. 249 westbound and 248 eastbound flights were made, connecting with trans-Atlantic services operated from Ireland. Operated with landplanes as follows:- until November 9, De Havilland DH.91 *Frobisher* class; after November 9, De Havilland DH.91 *Frobisher* class and Armstrong Whitworth *Whitley V*. (1944): From 4th July, a number of flights were made with De Havilland DH.91 (F class) landplanes, to connect with services operated from Shannon (Foynes).

Dublin - Isle of Man:

(1939) From June 5 twice daily on weekdays;

Manchester - Dublin:

(1939): Once daily with De Havilland DH.86 landplanes. (1940): From August 5, once daily on weekdays, with De Havilland. (1941): once daily on weekdays, with De Havilland D.H. 86 and Douglas DC-3 landplanes.

(1942): Once daily service on weekdays with De Havilland DH.86 landplanes. After November 15, Liverpool was used instead of Manchester (see following).

(1944): Aer Lingus with West Coast Air Services operated once daily on weekdays, with De Havilland DH. 86 landplanes.

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Liverpool - Dublin:

(1940): May 6 to August 4, once daily weekdays with De Havilland DH.86 aircraft.

(1942): After November 15, Liverpool replaced Manchester.

(1943): Once daily on weekdays, with De Havilland DH.86 landplanes.

(1944): until April 14, once daily on weekdays; April 15-September 7, service suspended; thereafter, once daily on weekdays, with De Havilland DH 86 and Douglas DC-3 landplanes.

(1945): Until October 7, once daily on weekdays; thereafter, twice daily on weekdays, with De Havilland D.H. 86 and Douglas DC-3 landplanes.

Dublin – Shannon:

(1942): Aer Lingus operated a three times weekly service August 12 – October 30, with De Havilland D.H. 86 landplanes, after which the service ceased.

Bristol - Shannon:

(1943): 121 return flights were made with BOAC landplanes as follows:- Until May 16, De Havilland DH.91 *Frobisher* class and Armstrong Whitworth *Whitley V*; May 17 to July 15, De Havilland DH.91 *Frobisher* class and Douglas *Dakota*; July 16 to August 29, Douglas *Dakota*. On August 29, the service ceased.

London-Shannon:

(1944): From February 11 to October 29, 289 return flights were made with Lockheed *Hudson* and *Dakota* landplanes.

(1945): In the year up to 29th October, 1945 BOAC made a total number of 578 land aircraft flights (289 eastbound and 289 westbound) from London to Shannon (Rineanna) with Douglas "Dakota" and Lockheed "Hudson" landplanes. On 29th October, the service ceased.

Appendix X

‘I gCuimhne Pheig’ by Richard (Dick) Slattery, May 24, 2001
(by the kind permission of his daughter, Leisha Heffernan)

11: SHANNON AIRPORT

I have read that it was likely that the British Government issued false weather reports in order to prevent Italian Air Marshal Balbo's Air Armada from landing in the territorial waters of the Irish Free State in the early 1930s. Britain's relations with Mussolini's Regime were strained then. In any event, de Valera's Government established the Irish Meteorological Service in 1936 with Englishman, Austin Nagle, as Director. Aer Lingus was in being and air transport was assuming more prominence. The logical outcome was the decision to set up an air base at Rineanna (The Point of the Marshes), Co. Clare. Pending the building of facilities capable of handling flying boats there, Foynes, Co. Limerick, was chosen. It had a natural set up for flying boats. However, it was not suitable for land planes.

The Meteorological Service (The Met Service) was attached to the Department of Industry and Commerce and was staffed by civil servants. First staffed by English and one Spanish forecaster, later Irish technical staff was recruited, i.e. Met Officers and Met Assistants. As soon as World War 11 commenced in September 1939, it was necessary to recruit six Clerical Officers (COs) to take up duty as Communications Officers in Foynes. Weather reports are recorded in an International Weather Code. Weather is extremely important in war. In consequence it could not be broadcast plain, because to do so would be an advantage to an enemy. The codes had to be ciphered. The COs were paid an allowance of £50 per annum - that is at least £2,000 per annum in money values today in order to attract recruits. In addition there were perks like night duty allowance and much overtime. The Met Service was regarded as an essential service and staff was not permitted to serve in other units of the Defence Forces.

The Flying Boat services were operated by B.O.A.C. (British Overseas Airways Corporation). They flew from the naval base at Poole in England and then to Lisbon in neutral Portugal and from there to many cities on the western coast of Africa and back again. As the service expanded, extra CO staff was required. A panel was set up to fill vacancies as they

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occurred. I was assigned to Foynes with effect from 1st June, 1942. I resigned from the L.D.F. - returning my rifle, ammunition, uniform etc. to my Santry base. I travelled on the one daily train from Dublin to Cork on Sunday, 31st May 1942, the first anniversary of the bombing of Dublin's North Strand. The train departed at 10 a.m. and stopped at every station en route - the stations on route were at least double those in use at present. Trains travelled slowly to save fuel. I changed at Limerick Junction to board the train to Limerick, arriving there about 6 p.m. There I took yet another train to Foynes - that railway line was discontinued in the 1950s. I was met at Foynes by my old friend, George McCudden, who had secured sleeping accommodation in a private house, with dining facilities at a 'Hotel'. In those days, guest houses were labelled 'Hotels', but during my three year stay in Foynes, legislation was passed defining the term 'Hotel'. After a couple of weeks I secured full accommodation there.

The landlady, who was married to an ex RIC pensioner, and her middle aged daughter looked after about 10 guests. We were now in an era of food rationing. Tea and butter were in short supply. There were ample supplies of beer and stout in the five public houses in Foynes. Spirits were limited to Portuguese brandy. By the way in Lisbon, Irish whiskey was available but no Portuguese brandy!! I shared a room with Hubert Lamb, an Englishman who was in charge of the Met Office, Foynes. If one were on night duty or away on leave or 'rest days', it was common practice to give one's bed to a colleague who resided in Limerick as accommodation in Foynes was very limited, especially if he had a quick change over on duty. One could cease duty at midnight after a 16 hour day and be back again at 8am the next morning. This arrangement would give one an extra 2 hours sleep. Overtime was paid at the rate of time and a quarter for the first 12 hours; time and a half for the next 6 and double rate for the next 12. Overtime beyond 30 hours weekly was not paid but carried over to the following week. Such payments were jokingly referred to as 'money from America'! I opened my first saving account in the Foynes Post office.

In the 'Hotel', the landlady's husband was a nice quiet gentleman. They had a second daughter. She was married and living in England. She had objected to the anti-conscription campaign in 1918. Her husband was a Black and Tan who allegedly shot dead in 1921, an I.R.A. man named Madigan in Shanagolden, with a dum dum bullet. In 1943 she discovered he was having an affair with a Wren (originally meant Women's Royal

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Naval Service). She returned home a sadder and wiser woman. I asked her father once, when we were talking of old times, what he thought of the Black and Tans. 'Boy', he said to me, 'they gave us great protection!' I was however, told by the locals that he was never a danger to the I.R.A. He minded his own business except for striving diligently to ensure that publicans abided by the licensing laws. Thus, in his own way, he gave good service to Ireland! I was one of four males to attend his funeral. There was full employment round the clock at Foynes. The Celtic Tiger had come - the village was awash with money. The undertakers availed of my services to shoulder his coffin. I did not offer but was pressed into action. The hearse took his remains to Knockpatrick, where the highest graveyard in Ireland is located. The hearse could only go so far; we shouldered his coffin up the long steep hill, with no relief. It was paradise to reach the grave.

A cipher is a secret code used for conveying a message or information in a disguised way. The CO staff at Foynes Met Office never exceeded 20 but COs were later recruited to work in the Airport Manager's Office and in Air Traffic Control. Some 50 COs from Industry and Commerce and later from other Government Departments served in Foynes during the Emergency - some returned voluntarily to Dublin or were promoted over the years. COs became involved in other Met. duties such as 'plotting' charts. About 12 COs covered the ciphering duties, the whole 24 hours, in three shifts. They had a room to themselves. Only the Met O.C. and his Deputy had a right to admission to it. Every 15 minutes the Army in nearby Mount Trenchard phoned on a special line for security. A short coded word like 'wood', 'chair', 'turf' etc. was in daily use and a correct answer signalled everything was in order. On a very rare occasion a flying boat pilot would look for admission, claiming he had received an incorrect message. The message as ciphered was rechecked but he was not admitted. I remember one morning Capt. Kelly-Rogers being very upset when that procedure was followed.¹ Ciphered messages were generally transmitted in Morse. Errors in transmission were possible. We used code books supplied by the British Embassy and code cards for use in Irish Syko machines supplied by the Irish Government. Only on one occasion did a weather

¹ Capt. Kelly-Rogers flew Churchill many times across the Atlantic. Kelly-Rogers was very offended when Churchill said in his "Memoirs" that they got lost once!

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report go out 'clear'. This happened due to a combination of circumstances. The same coloured pads were used. The clear rather than the ciphered message was passed to Radio and a newly recruited radio officer failed, and understandably so, to spot the difference. A month later the British lodged a complaint with the Irish government. Different coloured pads were immediately put in place.

My CO colleagues included: Dubliners Mickie Walls, Harry Sullivan, George McCudden, Frank Murray, Jerry O'Callaghan, Mick Barrett and Denny Lalor, Wexfordmen Fergie Hall and Frank O'Loughlin, Wicklow man Tim Desmond, Galwegian Jim Geoghegan, Laois man John Haslam, Clare's Jim Barry (who entered the Service the same day as I did) and Michael McInerney, Limerick's Robert Emmet Anderson, Donegal's Jack Sweeney, Belfast's Colm Jackson, Cameroon born Bill West, Tadhg Murphy from Macroom (a brother of the historian and well known columnist, Professor John F.) and Eamon McHugh from Roscommon. The four Supervisors were Harte, McInerney, Haslam and O'Loughlin. The 24 hour day was covered in three shifts. In the absence of a Supervisor, the most senior CO took charge. The two junior to me were Murphy and McHugh. If your replacement failed to turn up, you remained on duty or else sought a volunteer to do so. The regime was tough. You could be called to task if, for instance, you failed to wind the 24 hour G.M.T. clock. A note would await you beginning: 'Mr. ____ A poor view is taken- - -'. When the English O.C. Met resigned after a difference of opinion with the Director, he was replaced by a Waterford man, Austin Bourke. On hearing of Bourke's appointment, Paul Brown, Deputy O.C. who was married to a Rathkeale girl, Mai McCoy, resigned in protest. He was replaced by Kilian Rohan.⁹⁹

A few months after I began work in Foynes, there was a great increase in flying boat traffic. The Pacific Front was stabilised and the emphasis was on the opening of the 'Second Front' in France, as demanded by the Russians. A United States Consul named Boyle was stationed in Foynes. He was very wary and would only give us codes a day ahead. The Americans were led to believe we were all pro Germans. I remember one night being awakened at 3 am by colleagues celebrating in the 'Hotel', not only to the strains of *Ambrán na bFíann* (The Soldiers Song) but also

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Deutschland Uber Alles. Maybe the Consul heard of it! Once the Second Front was opened in June 1944, the tension eased.

The War in Europe ended on 5th May 1945. The building of the Airport Hotel³ to cater for increasing aircraft was in progress. Suddenly in mid-October we were informed that all staff were to be transferred to Rineanna; the time had come for the speedier land planes to replace the flying boats. In a draw, I was fortunate to secure one of the 36 places in the Rineanna Hostels, some 32 others had to seek accommodation in Limerick or Ennis. Most of the Foynes resident staff, including myself, travelled by sea in the Airport Launch from Foynes to Rineanna. It was one of the warmest days in the year and some of the staff availed of the opportunity to swim in the mouth of the River Fergus.

Clerical Officer staff had been engaged also in filling the roles of Met Assistant and were mainly at work in 'plotting' weather reports on charts, i.e. showing weather conditions by figures and symbols. European Charts were made every three hours and Atlantic Charts every six hours. Our involvement in this work began in mid-1943. From the day the War ended, ciphering came to an end and the COs were engaged solely on Met duties.

The Met Assistant staff at Foynes included Jackie Staunton, who won a Kerry championship medal with Shannon Rangers in 1945, Fergie Hennessy, Mickie Keane, Martin O'Herlihy, Mickie Murtagh, the brothers, Dermot and Maurice Keane, John Desmond Kelly, Tommie Reynolds, Paddy Howley and John Doherty. John Doherty and our next door neighbour in later years in Greenfields, Limerick, Jim Flood, were married to Jackson sisters from Foynes.'

² Kilian Rohan had a great sense of humour. After the 1953 All Ireland Hurling Final when Cork beat Galway, there was some tension between the rival supporters in the office. The captains Christy Ring and Michael Burke had a clash during the match and Burke got injured as a result. A man surnamed Christie had been hanged in England earlier in the year for mass murders. Kilian said Galway people were saying that they hanged the wrong Christie! Forty years later it was discovered that the man, Christie, hanged in England was innocent.

³ The Hotel subsequently converted into a Children's Hospital.

Appendix XI

Appreciation

Dr Mariano Doporto

(from IMS-50)

Dr Mariano Doporto, a Basque, was born in Caceres, Spain in 1902. He studied Physics at the University of Barcelona where he graduated with a Bachelor of Science Degree in 1922. He then joined the Spanish Meteorological Service and, at the outbreak of the Spanish Civil War in 1936 was in charge of the weather forecast centre at Barcelona. In 1938 he was, awarded a Doctorate in Science by the University of Madrid.¹

During the Civil War he fought on the anti-Franco side and he was reputed to have saved the lives of many of his countrymen. Towards the end of the war he escaped to France and was interned there for a while. Subsequently he was recruited by the Irish Meteorological Service, then in its infancy, and he arrived in Ireland from Biarritz in 1939. He reported to the Meteorological Office at Foynes, Co. Limerick on the south bank of the river Shannon estuary about 27 km down-stream from Limerick on November 24, 1939. Foynes was at that time the base for the newly established trans-Atlantic flying boat services to and from North America, the US and Canada. Dr Doporto was recruited to the Irish Service with the rank of Senior Meteorological Officer which would correspond to that of a Divisional Head.

When Doporto arrived in Ireland he did not have a passport but instead had an elaborate document issued by one of the refugee organisations. It contained details such as side photographs and fingerprints.

In January 1941 he was appointed officer-in-charge at the Meteorological Office at Foynes and in September 1941 he was transferred

¹ See photographs of Dr Doporto and Professor Pollak in photo section.

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as officer-in-charge of Dublin Airport. Subsequently, he was made Superintendent of Synoptic Meteorology and attached to the Headquarters of the Meteorological Service. He was promoted to the rank of Assistant Director in June 1947 and was appointed Director on the resignation of Austen Nagle in 1948. He had not, up to this time, applied for Irish citizenship and it was suggested to him that he should do so as it would improve his chances of promotion. This he refused to do but indicated that if he got the job he would apply. He duly got the Directorship, applied for and got Irish citizenship.

The story is told that the previous Director, Austen Nagle, who was leaving to take up a post in the US Weather Bureau, was making his farewells to the staff and told Doporto how impressed he was with the goodwill he found everywhere. Doporto deflated him by quoting an old Spanish proverb which, roughly translated meant – ‘You build bridges beneath the departing enemy’.

He was essentially a quiet man and he disliked the cut and thrust of departmental discussions, but he had a warm temper when aroused. He was the author of many scientific papers during his career, e.g. for earlier works see Appendix VI. He died suddenly in September 1964.

Professor Leo W Pollak

(by F.E. Dixon)

When the first seven meteorological cadets attended lectures on Dynamical Meteorology from Professor Brunt in Imperial College, London in April 1939, two tiny men sat together at the back of the lecture room. They were two refugees from Hitler’s Europe. They were already friends and later to become collaborators in an important textbook on Climatology – V Conrad and L.W. Pollak.

It was not clear whether Brunt was more flattered or embarrassed by their attention to his lecturing. However, they were not there to learn his brand of meteorology, but to improve their acquaintance with the English language. Leo Pollak could already read English fluently – in 1937 when his wife was on holiday in England she had sent him postcards written in

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English. Although we did not know of them, negotiation must have been in progress which led to Pollak joining us at Foynes in late 1939.

When Pollak met S.P. Peters they discovered that in World War I they had both been in the same sector of the Austro-Italian border area. Dr Pollak delightedly revealed that he had broken the Allies code and been able to make use of pilot balloon upper air winds being broadcast by Peters.

Dr Pollak's first task was to assist in training the still raw recruits. So I heard the basic meteorology for the third time, having been lectured by Peters in 1936, Brunt and Co. in 1939 and now Pollak in 1940. And of the three he was the best teacher. Every lecture was thoroughly prepared and I think rehearsed.

Dr Pollak's contribution to Irish meteorology was tremendous. After really educating the men who would eventually run the Service he inaugurated the Climatological Division in the cramped premises of 14/15 St Andrew Street. One stroke of good fortune for the Meteorological Service was that the war conditions confined the activities of the Irish Hospitals Sweeps, who found many of their staff redundant. The Civil Service waived the rules and took in many of the girl clerks by special arrangement. And these girls were intelligent and attractive much to Professor Pollak's delight.

A log book of 1942 survives with a summary by T. J. Morley of the work carried out each day by each member of the staff. It was inspected weekly by L W Pollak (or in his absence by F.E. Dixon) and checked by the Director A.H. Nagle. The work was interrupted in August 1942, 21st and 22nd being devoted to transferring to O'Connell St and 24th -25th to rearranging material.

Addendum: In 1947 Professor Pollak left the Meteorological Service to head up the new School of Cosmic Physics and constituent school of the Dublin Institute of Advanced Studies, Dublin. Born in Czechoslovakia in 1888, Pollak was Professor at the Geophysical Institute, Prague before coming to Ireland. Leo Wenzel Pollak died in 1964.

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