INSTITIÚID ÁRD-LÉINN BHAILE ÁTHA CLIATH
(Dublin Institute for Advanced Studies)

Annual Report

of the work of the Institute and its Constituent Schools
presented by the Council to the Minister for Education
in respect of the Financial Year 1951-1952.

Pr.1760

INSTITIÚID ÁRD-LÉINN BHAILE ÁTHA CLIATH
(Dublin Institute for Advanced Studies)

Annual Report of the work of the Institute and its Constituent Schools presented by the Council for the Financial Year 1951-1952

In accordance with the provisions of Section 29 of the Institute for Advanced Studies Act, 1940 (No. 13 of 1940), the Council of the Institute has the honour to present to the Minister for Education for submission to the Government a report of the work and activities of the Institute and its Constituent Schools for the financial year ending 31st March, 1952.

The general purpose which it is hoped to accomplish is clearly stated in the Act establishing the Institute, namely, the Institute for Advanced Studies Act, 1940 (No. 13 of 1940) and in the Establishment Orders establishing the three Constituent Schools, namely, the Institute for Advanced Studies (School of Celtic Studies) Establishment Order, 1940, the Institute for Advanced studies (School of Theoretical Physics) Establishment Order, 1940, and the Institute for Advanced Studies (School of Cosmic Physics) Establishment Order, 1947, and need not be referred to here. It is deemed desirable, however, to include in the report for the purposes of record certain particulars about the constitution of the Council of the Institute and of the membership of the Governing Boards of the three Constituent Schools on the 31st March, 1952.

The report is presented under the following principal heads:-

I - Constitution of the Council of the Institute and of the Governing Boards of the three Constituent Schools on the 31st March, 1952.

II - Report of the Governing Board of the School of Celtic Studies.

III - Report of the Governing Board of the School of Theoretical Physics.

IV - Report of the Governing Board of the School of Cosmic Physics.

I - Constitution of the Council of the Institute and of the Governing Boards of the three Constituent Schools on the 31st March 1952.

1. THE COUNCIL OF THE INSTITUTE.

Chairman:

Right Reverend Monsignor Patrick Browne, M.A., D.Sc.

Ex-Officio Members:

Dr. Michael Tierney, M.A., D.Litt.,
President, University College, Dublin;

Dr. Albert J. McConnell, M.A., M.Sc., Sc.D.,
Provost, Trinity College, Dublin;

Right Reverend Monsignor Patrick Boylan, D.D., M.A., D.Litt.,
President, Royal Irish Academy.

Members Appointed by the Governing Boards of the Constituent Schools:

Professor Michael A. O'Brien, M.A., Ph.D.;

Professor Felix E. W. Hackett, M.A., M.Sc., Ph.D.;

Professor Leo W. Pollak, Ph.D., M.R.I.A.

2. THE GOVERNING BOARD OF THE SCHOOL OF CELTIC STUDIES.

Chairman:

Right Reverend Monsignor Patrick Boylan, D.D., M.A., D.Litt.

Senior Professors:

Michael A. O'Brien, M.A., Ph.D.;

Daniel A. Binchy, M.A., Ph.D., B.L.;

Myles Dillon, M.A., Ph.D.

Appointed Members

Miss Áine de Paor, M.A., Ph.D.;

Reverend John Ryan, S.J., M.A., D.Litt.;

Reverend Francis Shaw, S.J., M.A.;

Éamonn Mac Giolla Iasachta, M.A., D.Litt., M.R.I.A.;

Ernest Gordon Quin, M.A., F.T.C.D.;

Reverend Donnchadh Ó Floinn, M.A.

3. THE GOVERNING BOARD OF THE SCHOOL OF THEORETICAL PHYSICS.

Chairman

Felix E. W. Hackett, M.A., M.Sc., Ph.D.;

Senior Professors:

Erwin Schroedinger, M.A., Ph.D., D.Sc., F.R.S.;

John L. Synge, M.A., Sc.D., M.R.I.A., F.R.S.C., F.R.S.

Appointed Members:

Albert J. McConnell, M.A., M.Sc., Sc.D.;

George R. Keating, M.Sc.;

Thomas S. Wheeler, Ph.D., D.Sc., F.R.C.Sc.I.;

Reverend James R. McConnell, D.Sc.;

Máirtín Ó Tnúthail, M.Sc.;

Patrick Quinlan, B.E., M.Sc., Ph.D.

4. THE GOVERNING BOARD OF THE SCHOOL OF COSMIC PHYSICS.

Chairman:

John J. Nolan, M.A., D.Sc.

Senior Professors:

Leo W. Pollak, Ph.D., M.R.I.A.;

Hermann A. Brück, D.Phil., Ph.D., M.R.I.A.

Appointed Members:

John J. Dowling, M.A., F.Inst.Phys.;

Eric M. Lindsay, M.A., M.Sc., Ph.D.;

Rev. Patrick J. I. McLaughlin, D.Sc.;

Thomas Edwin Nevin, D.Sc.;

Patrick J. Nolan, Ph.D., D.Sc.;

John H. J. Poole, M.A., B.A.I., Sc.D.;

Ernest T. S. Walton, M.A., M.Sc., Ph.D., F.T.C.D.;

Mariano Doporto, D.Phys.Sc.

II - Report of the Governing Board of the School of Celtic Studies.

1. ACADEMIC STAFF, SCHOLARS AND EXTERN RESEARCH WORKERS.

Senior Professors:

Michael A. O'Brien, Director of the School;

Daniel A. Binchy;

Myles Dillon.

Professors:

Brian Ó Cuív (as from 1 April, 1951);

James P. Carney (as from 1 April, 1951).

Assistant Professors:

Miss Cecile O'Rahilly;

David Greene;

Rev. Cuthbert McGrath, O.F.M. (as from 1 April, 1951).

Assistant:

Miss Sheila Falconer.

Scholars:

Louis Paul Némo (Roparz Hémon);

Mrs. Nessa Doran;

Edouard Bachellery.

Extern Research Workers commissioned by the School:

Dr. R. I. Best;

Mr. Seán Mac Airt;

Mr. Liam Price;

Mrs. Mary Ellen Carney;

Rev. Shan Ó Cuív;

Professor J. Vendryès;

Dr. Tomás de Bhaldraithe;

Rev. Seán Ó Cathain, S.J.;

Rev. Lambert McKenna, S.J.;

Rev. Canice Mooney, O.F.M.;

Rev. Anselm Faulkner, O.F.M.;

Rev. Pádraig Ó Suilleabháin, O.F.M.;

Rev. Bartholomew Egan, O.F.M.;

Professor Heinrich Wagner.

2. GENERAL LINES OF RESEARCH WORK.

During the year the School continued research work in various branches of Irish, Welsh and Breton studies. At the end of the period under review five volumes edited or written by members of the staff or by extern research workers had been published, eighteen were in the press, and material for some twenty other works was in course of preparation.

Work on the modern spoken dialects continued and approximately half of the material required for the Irish Linguistic Atlas had been collected.

Work continued on the Dictionary of Classical Modern Irish, in connection with which large collections were made.

The Mediaeval and Modern Irish Texts Series, intended to provide handy and up-to-date editions of Irish texts for the use of University and other students, made good progress during the year. Two new texts were sent to press and two others, long out of print, were being reprinted.

The Etymological Dictionary of the Irish Language by Professor Vendryès was well under way.

A further part of the journal of the School (Celtica, Vol.II, pt.1) under the editorship of M. A. O'Brien appeared in 1951 and material for Vol.II, pt.2 was either being prepared or was in the press at the end of the period under review.

A complete record of the work of the individual members of the academic staff, scholars and research workers follows.

Senior Professors:

Michael A. O'Brien: Editor of Celtica Vol.II, pt.1; first fasciculus (256 printed pages) of the Book of Leinster revised and checked twice with photostats and manuscript; continued work on the Indexes of Vol.I (in the press) of Corpus Genealogiarum Hibernicarum, and on the texts of Vols.II and III; work progressed on a definitive edition of the Old Irish Life of St. Brigid; considerable progress made on a new edition of the Feast of Bricriu; as a contribution to Ériu, a text from Rawlinson B. 502 was transcribed, edited and passed for press; a lengthy paper (to be read in Cambridge) was prepared on Old Irish Personal Names.

Daniel A. Binchy: Work on Early Irish Law and legal texts. During the year Dr. Binchy continued his seminar on Early Irish Law. An article on the Leech in Ancient Ireland prepared for publication in the Special Medical Congress Number of the Irish Medical Journal.

Myles Dillon: The General Index to the British Museum Catalogue was revised and sent to press; proofs of half the copy of Letter G for the R.I.A. Contributions to a Dictionary of the Irish Language, were received and correction was proceeding; in the Mediaeval and Modern Irish Texts Series the manuscript of Airne Fíngein by J. Vendryès was read and the first proof revised for press; notes and vocabulary of edition of Serglige Con Culainn were sent to the printer; as a contribution to Ériu a text from T.C.D. H. 3. 18 on 'The Finding of Cashel' was transcribed, edited and sent to the printer; a prose version of Saltair na Rann was edited for the next number of Ériu; work was done in Co. Mayo with Professor Wagner on the Linguistic Atlas; a critical text and translation of the first three chapters of Lebor na gCert was prepared; Tóruidheacht air Lorg Chríosta was being excerpted for the Modern Irish Dictionary.

Professors:

Brian Ó Cuív: An edition of Párliament na mBan passed for press; three lectures on Irish Dialects and Irish Speaking Districts published; three articles prepared and published in Celtica, Vol.II, pt.1; an edition of Two Poems of Invocation to St. Gobnait prepared for publication in Éigse; delivered a course of lectures on Modern Irish at London University.

James P. Carney: Work on genealogical material dealing with the O'Reillys continued; work proceeded on various aspects of Irish Literature; on leave of absence as Visiting Lecturer at Uppsala University where he continued his courses on Irish and Irish Literature.

Assistant Professors:

Miss Cecile O'Rahilly: Edition of five seventeenth century Irish poems completed; work on an edition of Trompa na bhFlaitheas commenced; work on the Dictionary of Classical Irish continued.

David Greene: Preparation of an edition of poems on the Maguires of Fermanagh from a Copenhagen MS; four articles were published in Celtica, Vol.II, pt.1, and one for Ériu was passed for press; commenced new edition of Fingal Ronain.

Rev. Cuthbert McGrath, O.F.M.: Work on Plunket's Irish Dictionary in progress; two volumes of Franciscan verse in the press.

Assistant:

Miss Sheila Falconer: An edition of an Early Modern Irish version of the Quest of the Holy Grail in the press; work proceeded on The Verbal System of the LU Táin; review of "La legende Arthurienne et le Graal" prepared for publication in Celtica.

Scholars:

Roparz Hémon: Continued research work on various aspects of Middle and Modern Breton. During the year continued his course of lectures on Middle and Modern Breton.

Mrs. Nessa Doran: Work commenced on the Bardic poems in the Book of Fermoy.

M. Edouard Bachellery: Commenced preparation of a critical edition of Tochmarc Becfola.

Extern Research Workers:

Dr. R. I. Best: First volume of an edition of the Book of Leinster in the press; material for Vol.II prepared and sent to printers.

Seán Mac Airt: Work commenced on a new edition of the Annals of Ulster.

Liam Price: Work continued on the Place-Names of Wicklow.

Mrs. Mary Ellen Carney: Work continued on the Irish version of the Aphorisms of Hippocrates.

Rev. Shan Ó Cuív: A Bibliography of the works of Canon Peter O'Leary completed and sent to printers.

Professor Vendryès: Edition of Airne Fíngein completed and sent to printers; work on an etymological dictionary of Irish continued.

Tomás de Bhaldraithe: Work on the phonology and grammar of the Irish of Cois Fhairrge in the press.

Rev. Seán Ó Cathâin: Edition of Betha Mhuire in the press.

Rev. Lambert McKenna: Edition of the Book of O'Hara completed and published. Edition of text on "Metrical Defects in Bardic Poetry" prepared for publication.

Rev. Canice Mooney, O.F.M.: Edition of Scáthán Shacramuinte na hAithrighe passed for press; an edition of Scarmónta Chontae Thir Eoghain in preparation and an edition of Poenitentiarium Sancti Maelruain prepared for Celtica.

Rev. Anselm Faulkner, O.F.M.: Edition of Parrthas an Anma in the press; editions of Beatha Dhiadha and Scáthán Spioradálta in progress.

Rev. Pádraig Ó Súilleabháin, O.F.M.: Editions of Rialachas San Froinsias, Beatha San Froinsias and Lucerna Fidelium in the press; work on editions of Buaidh na Croiche and An tAithridheach Ríogha in progress.

Rev. Bartholomew Egan, O.F.M.: Editions of O'Hussey's and O'Mulconry's grammars in progress.

Heinrich Wagner: Continued collection of material for an Irish Linguistic Atlas in counties Galway, Mayo, Clare, Cork and Kerry.

3. SEMINAR AND LECTURES.

Professor Binchy continued his Seminar on Early Irish Law. Meetings were held weekly on Thursdays during the university terms.

A course of lectures on Middle and Modern Breton was given by M. Roparz Hémon. Lectures were delivered weekly during the university terms.

Professor Ó Cuív gave a course of lectures on Modern Irish at the University of London.

Professor Carney gave courses on Irish and Irish Literature at the University of Uppsala.

4. STATUTORY PUBLIC LECTURE.

The Statutory Public Lecture under the auspices of the School was delivered by Professor Heinrich Wagner in Trinity College, Dublin, on Friday, the 25th January 1952. Professor Wagner's subject was The Irish Linguistic Atlas - A Preliminary Report.

5. PUBLICATIONS.

(a) Published by the Institute:

		Date of Publication
SCÉLA MUCCE MEIC DATHÓ. Edited by Rudolf Thurneysen. (Mediaeval and Modern Irish Texts Series, Vol.VI. Reprinted).		
pp. ix + 67	Price 4s.	31/5/51
THE ANNALS OF INISFALLEN. Edited by Seán Mac Airt.		
pp. lii + 596	Price 30s.	8/6/51
IRISH DIALECTS AND IRISH-SPEAKING DISTRICTS. By Brian Ó Cuív.		
pp. 94 + 2 maps	Price 3s.	2/7/51
THE BOOK OF O'HARA. Leabhar Í Eadhra. Edited by Lambert McKenna, S.J.		
pp. xxxii + 458 + 2 plates.	Price 15s.	19/3/52
CELTICA. Vol.II, Part 1. Edited by M. A. O'Brien.		
pp. 216	Price 5s.	28/3/52

(b) Contributions to periodicals:

Brian Ó Cuív: The Seventeen Wonders of the Night of Christ's Birth - Eigse, 7, 116, 1950.

Myles Dillon: The Taboos of the Irish Kings - P.R.I.A. 54 C 1, 1951.

III - Report of the Governing Board of the School of Theoretical Physics:

1. ACADEMIC STAFF AND SCHOLARS.

Senior Professors:

Erwin Schroedinger, Director of the School;

John L. Synge.

Visiting Professor:

Herbert S. Green.

Scholars:

H. Messel (left October 1951);

J. W. Gardner (left May 1951);

Rev. J. McMahon;

O. Bergmann;

O. Hittmair (left October 1951);

H. Freistadt (entered October 1951, left December 1951);

A. Bork (entered October 1951);

N. Balázs (entered October 1951);

F. Roesler (entered October 1951);

G. H. F. Gardner;

S. O'Brien (entered October 1951).

Technical Assistant:

Miss Mary Houston (left May 1951);

Miss Evelyn Wills (appointed June 1951).

2. GENERAL LINES OF RESEARCH WORK.

Research was carried out in a variety of widely differing fields, in particular:-

Professor Schroedinger was led by his lectures to the seminar on the currently accepted foundation of Quantum Theory to take up a strong antagonistic position against the current attitude. He

developed his arguments in several papers, partly already published by now, partly to be listed in the next (1952/53) report. The same holds for lectures on the subject given to the Dublin July-Colloquium and to the Rencontres Internationales de Genève (September 1952). The controversial points were amply discussed at the School with the scholars and with senior colleagues.

Professor Synge's research was chiefly concerned (a) with the concept of rigid body motions in relativity, and the possible explanation of the results obtained by D. C. Miller in the Michelson-Morley experiment, and (b) with the systematic construction of the theory of geometrical mechanics and de Broglie waves in terms of the geometry of space-time, using the methods of Hamilton's geometrical optics. Mr. G. H. F. Gardner, Rev. J. J. McMahon and Mr. S. O'Brien worked with Professor Synge, and, of these, Gardner investigated Lorentz-invariant definitions of rigid body motions and devised a new definition in which rigidity is transmitted from a base-point with the fundamental velocity c. Meantime Father McMahon generalized the method of pyramid functions and vector fields from two to three dimensions, and used the method to obtain, by rigorous mathematical reasoning, a lower bound for the electrostatic capacity of a cube which is higher than any previously obtained. O'Brien was investigating jump conditions at discontinuities in general relativity; the results will be published shortly in a Communication.

Dr. Bergmann worked on a numerical method for solving collision problems, and on the polarization of light in Born's electrodynamics.

Dr. Freistadt and Mr. Bork attacked the problem of discrete space-time in field theories; the latter also investigated the derivation of commutation relations from a variational principle. He gave two excellent lectures to the seminar on these two subjects.

Dr. Balázs has been working on various problems in electro-dynamics, in particular on the momentum of a light wave moving in a dielectric;

and on some questions in quantum mechanics, in particular on the condition for two quantum variables being capable of simultaneous sharp values. He also lectured in the seminar on superfluid helium.

Dr. Roesler attacked various problems, i.a. the Bremsstrahlung from very fast, charged particles in inhomogeneous magnetic fields, and the diffusion of cosmic rays in the galaxies and in intergalactic space. Together with Mr. McCusker of the School of Cosmic Physics he gave a new theory of the nucleonic cascade inside a nucleus, and compared it with known facts. He also lectured on various problems in the seminar.

3. SEMINAR AND LECTURES.

During the early part of the summer term Professor Green continued his lectures on Wednesdays to the seminar on the Statistical Mechanics of Assemblies of Interacting Particles. He was followed by Professor Schroedinger, who gave a course on Self-Dual Tensors and Spin Transformation, and Professor Synge, who gave a lecture on the Gravitational Two-Body Problem.

Professor Synge conducted two courses of lectures in the first winter term. The first course was on the rigid body in relativity; a theory to explain non-null results of the Michelson-Morley experiment. The second course, which followed, was on the gravitational theory of A. N. Whitehead.

In the second winter term Professor Schroedinger spoke to the seminar on the transformation theory and the interpretation in quantum mechanics.

As usual, members of staff and students from University College, Dublin, Trinity College, and St. Patrick's College, Maynooth, as well as members of the two Physics Schools of the Institute, attended these courses.

4. STATUTORY PUBLIC LECTURE.

The Statutory Public Lecture under the auspices of the School was delivered in University College, Dublin, on Thursday 20th March, 1952, at 4.0 p.m. by Professor Schroedinger. The lecture, which is to be the first of a series, was entitled "Science at Play", and accompanied by slides and demonstrations.

5. VISITING PROFESSORS.

Professor H. S. Green (now of the University of Adelaide, South Australia) spent the academic year 1950-1951 as Visiting Professor at the Institute.

6. DISTINGUISHED VISITOR.

Professor R. Fürth of Birkbeck College, London, visited Dublin in November 1951 at the invitation of the Institute. Though the primary purpose of his visit was to lecture to the School of Cosmic Physics, he also lectured to our seminar, in two lectures, on November 7th and 9th, on Some Contributions to the Theory of Fluctuations and Brownian Movement.

7. PROFESSORS' ACTIVITIES.

From 20th August to 9th September, 1951, Professor Schroedinger conducted, together with Dr. W. Mers, Bern, the seminar courses of a working group on "Physics and Technology" at the International Forum at Alpbach, Tyrol. While there, he gave a lecture in a plenary meeting on "Particles and Waves", illustrated by slides borrowed from the School.

Professor Synge continued his leave of absence as Visiting Research Professor at the Institute for Fluid Dynamics and Applied Mathematics at the University of Maryland to 30th June 1951. There he conducted a seminar on the method of the hypercircle for the approximate solution

of boundary value problems, and gave three public lectures on "The Relativity Theory of A. N. Whitehead". He also lectured at Harvard University, Brown University and Carnegie Institute of Technology.

After his return from America, Professor Synge attended the St. Andrews Mathematical Colloquium in July 1951, and gave five lectures there on "The Geometry of Function-Space". He also lectured to the Royal Dublin Society at the Fitzgerald Centennial Celebration, on October 30th 1951.

In the new year, Professor Synge lectured at the University of Sheffield and at the University College of North Staffordshire (February); and at University College, Cork, he spoke on Form and Number (March).

8. PUBLICATIONS.

(1) Book:

SCIENCE AND HUMANISM. By E. Schroedinger.
University Press, Cambridge, 1952.

(2) Communications of the Dublin Institute for Advanced Studies - Series A : Physics:

No. 8 - Studies in the Generalized Theory of Gravitation II : The Velocity of Light. By O. Hittmair and E. Schroedinger.

pp. 15. Price 2s. 6d. Published 30th September, 1951.

(3) Contributions to Periodicals:

(a) Contributions recorded as in the press in previous reports -

M. Brdička: On Gravitational Waves - P.R.I.A. 54 A 9, 137, March 1951.

J. W. Gardner: Beta-Alpha-Correlation in the Disintegration of Li^8 - Phys. Rev. 82, 283, April 1951.

On the Elimination of Divergences from Classical Electrodynamics - Proc. Phys. Soc. A, 64, 427, April 1951.

H. S. Green: The Quantum Mechanics of Assemblies of Interacting Particles - J. Chem. Phys. 19, 955, July 1951.

H. Messel: On the Nucleon Cascade with Ionization Loss - Phys. Rev. 83, 21, July, 1951.

On some recent calculations on Cascade Shower Theory - Phys. Rev. 82, 259, April 1951.

H. Messel: A Note on the Development of the Nucleon Component of the Cosmic Radiation in Air when Ionization Losses are Accounted for - Phys. Rev. 83, 26, July 1951.

Further Results on the Fluctuation Problem in Electron-Photon Cascade Shower Theory and the Probability Distribution Function - Proc. Phys. Soc. A, 64, 807, September 1951.

J. L. Synge: On permanent vector-lines in N-dimensions - Proc. American Mathematical Society, 2, 370, June 1951.

The fundamental theorem of electrical networks - Quart. Appl. Math., 9 113, July 1951.

The Relativity Theory of A. N. Whitehead - University of Maryland, Institute for Fluid Dynamics and Applied Mathematics, Lecture Series No. 5, 1951; 49 pp.

Triangulation in the hypercircle method for plane problems - P.R.I.A. 54 A 21, 341, January 1952.

W. Thirring: Pair Creation of Mesons - P.R.I.A. 54 A 14, 205 July 1951.

(b) New Contributions:-

W. Thirring: Bericht über die neuen Entdeckungenim Wasserstoffspektrum - Acta Phys. Austriaca, 4, 325, May 1951.

A. Papapetrou and E. Schroedinger: The point-charge in the Non-Symmetric Field Theory - Nature, 168, 40, July 1951.

E. Schroedinger: A Combinatorial Problem in Counting Cosmic Rays - Proc. Phys. Soc. A, 64, 1040, November 1951.

Dirac's New Electrodynamics - Nature, 169, 538, March 1952.

Relativistic Fourier Reciprocity and the Elementary Masses - P.R.I.A. 55 A 2, 29, May 1952.

Are there Quantum Jumps? - B.J.P.S., 3, August and November numbers, 1952.

H. Freistadt: Sur l'hypothèse d'un intervalle fondamental et les théories de Darling et Born - Comptes Rendus des séances de l'Académie des Sciences, 235, 23, July 1952.

H. Messel: Average Numbers for the Development of the Nucleon Component of the Cosmic Radiation in Air - Proc. Phys. Soc. A, 64, 726, August 1951.

H. Messel and H. S. Green: The Differential Cross Section for High Energy Nucleon-Nucleon Collisions - Phys. Rev. 83, 842, August 1951.

H. S. Green and H. Messel: The Differential Cross Section for High Energy Nucleon-Nucleon Collisions and the Mean Souare Angle of Scatter - Proc. Phys. Soc. A, 64, 1083, December 1951.

J. L. Synge: Conditions satisfied by the expansion and vorticity of a viscous fluid in a fixed container - Quart. Appl. Math., 9, 319, October 1951.

J. L. Synge: Pointwise bounds for the solutions of certain boundary-value problems - Proc. Roy. Soc. A, 208, 170, August 1951.

Hamilton's method in geometrical optics - University of Maryland, Institute for Fluid Dynamics and Applied Mathematics, Lecture Series No. 9, 1951; 64 pp.

Approximations in boundary-value problems by the method of the hypercircle in function-space - Rendiconti di Matematica e delle sue applicazioni (5) 10, 24, Fasc. 1-2, 1951.

Orbits and rays in the gravitational field of a finite sphere according to the theory of A. N. Whitehead - Proc. Roy. Soc. A, 211, 303, March 1952.

Vitesse de phase et vitesse de groupe en optique relativiste - Revue d'Optique 31, 121, No. 3, 1952.

Effects of acceleration in the Michelson-Morley experiment - Sci. Proc. R.D.S., 26 (N.S.), 45, May, 1952.

Sur les connections relativistes entre la fréquence, la longeur d'onde, la vitesse de phase et la vitesse de groupe - Comptes Rendus des séances de l'Académie des Sciences, 234, 1669, April, 1952.

Gardner's hypothesis and the Michelson-Morley experiment - Nature, 170, 243, August 1952.

G. H. F. Gardner: Rigid body motions in special relativity - Nature, 170, 243, August 1952.

IV - Report of the Governing Board of the School of Cosmic Physics.

A. Astronomical Section, Dunsink Observatory.

1. ACADEMIC STAFF AND SCHOLARS

Senior Professor: H. A. Brück.

Chief Assistant: H. E. Butler.

Assistant: Mrs. Máire T. Brück, née Conway.

Assistant (Part-time): F. J. O'Connor.

Scholar: A. N. Argue.

2. EQUIPMENT.

A new mounting has been constructed for the 16-inch secondary mirror of the coelostat, and a new slow-motion drive has also been fitted. The former wooden cells for the pair of convex mirrors in the train of the solar telescope have been replaced by cast aluminum cells, and arrangements have been made to incorporate an additional 6-inch flat mirror into the same telescope. With this last mirror in position, a 3-inch image of the Sun can be produced in addition to the 9 and 15-inch images which are ordinarily used.

Improvements have been made in the photoelectric photometer which is attached to the 15-inch reflector, and another similar photometer has been constructed for the 6-inch Grubb refractor. The latter telescope has been provisionally mounted alongside the 15-inch in such a way that the two telescopes, though attached to the same mounting, can be pointed independently. With this double telescope photoelectric observations can be made on two stars simultaneously.

A photoelectric photometer using a new type of photo-multiplier tube which has been produced recently in Britain, has been constructed and attached to the 12-inch refractor in the South dome. Another photoelectric recording apparatus, also built at the Observatory, has been attached to the Pistor and Martins 6-inch Transit Circle with which times of transits of the brighter stars can now be measured electrically.

3. RESEARCH WORK

Dr. Máire Brück has completed a paper on her Edinburgh observations of the profile of the hydrogen Hα line in the spectra of solar prominences. This paper has been communicated by the Astronomer Royal for Scotland to the Royal Astronomical Society and has appeared in its Monthly Notices. On the basis of these observations and using the theory of self-absorption and of its effect on line profiles, Dr. Brück has been able to derive new values for the temperature in prominences. A paper giving these results has been submitted to the Royal Irish Academy.

Recordings of stellar scintillation have been continued by Dr. Butler, and a very complete set of observations, both photoelectric and photographic, has been obtained. Accounts of these observations have been published in the Proceedings of the Royal Irish Academy and in the Irish Astronomical Journal.

Experiments on the use of simultaneous photoelectric observations on two stars in which effects of atmospheric variations are reduced to a minimum, have been made with the 15-inch and 6-inch telescopes. The results have been so promising that a systematic programme with "matched telescopes" is to be started in due course. Preliminary results of this work have been published.

Mr. Argue has been engaged in testing the new photoelectric photometer incorporating an E.M.I. photomultiplier, and in comparing its performance with that of more standard instruments. A paper giving details of these tests is to be published soon.

A list of all solar eclipses which were visible in Ireland and Iona between the years 400 and 1000 A.D. has been completed by Mr. O'Connor for the use of Irish historians.

Professor Brück and Dr. D. A. Jackson travelled to Khartoum in February to observe the total solar eclipse of February 25. The equipment used for the expedition, consisted of an 8-inch Grubb coelostat loaned to the Observatory by the Royal Dublin Society, a 15-inch concave mirror, a quartz spectrograph, the latter being the property of Trinity

College, Dublin, and a quartz Fabry-Perot interferometer. The aim of the expedition was to obtain flash spectra of the solar chromosphere with the highest possible resolution and far into the ultra-violet. Such spectra were to be used for the accurate measurement of line-widths and thereby for a new determination of the chromospheric temperature. Though this was the first attempt to photograph the flash spectrum with an interferometer, good spectra were obtained which are being analysed at Dunsink.

Dr. Butler left Dunsink in December for Blomfontein where he is to spend a term using the Armagh-Dunsink-Harvard Telescope. The instrument which after certain adjustments has now been brought into perfect working order, has been used by Dr. Butler for the observation of open star clusters whose study, it is hoped, will contribute to the solution of the problem of whether the structure of the galaxy is similar to that of a spiral nebula.

4. LECTURES.

Various lectures have been given by Professor Brück, Dr. Máire Brück and Dr. H. E. Butler in Armagh, Belfast, Cambridge and Dublin.

5. VISITORS.

The practice of the monthly Open Saturday has been continued and has proved as popular as ever. The Irish Astronomical Society has held its Annual General Meeting at Dunsink in September. Quite a number of foreign astronomers have also visited the Observatory.

6. PUBLICATIONS.

Contributions from the Dunsink Observatory:

No. 2: H. E. Butler: Photoelectric Recording of Stellar Occultations (Monthly Notices R.A.S. 111, 393. 1951).

No. 3: Mary T. Conway: A Study of the Profile of the Hydrogen Hα -line in the Spectra of Solar Prominences. (Proc. Roy. Irish Academy 54. 311, 1952).

No. 4: H. E. Butler: Observations of Stellar Scintillation, (Proc. Roy. Irish Academy 54, 321, 1952).

Dunsink Observatory Reprints:

No. 4: H. E. Butler: Scintillation and Atmospheric Seeing. (Irish Astron. Journal 1, 225, 1951).

No. 5: A. N. Argue and H. E. Butler: Simultaneous Photoelectric Recordings with Two Telescopes. (Observatory 72, 31, 1952).

Among other publications is:

Mary T. Conway: Studies of H_α Line Profiles in Prominences. (Monthly Notices R.A.S. 112, 55, 1952).

B. Cosmic Ray Section.

1. ACADEMIC STAFF AND SCHOLARS.

Senior Professor: Vacant.

Assistant Professor: C. B. A. McCusker.

Research Associate: T. E. Nevin.

Scholars: D. D. Millar (left 30 September, 1951);
N. A. Porter (entered 1 September, 1951).

2. EXPERIMENTAL AND RESEARCH WORK.

The experimental investigations in the Cosmic Ray Section were concerned mainly with the study of extensive air showers and with the very important question of whether in a collision between a high energy proton and a proton or neutron (nucleon) in a nucleus one or several mesons are produced in the collision, the question of so-called plural or multiple production.

In the early part of the year an experiment of McCusker and Millar begun in the previous year was completed. In this experiment a study was made of k, the ratio of penetrating particles to soft particles in air showers. A small number of showers were found for which $k \approx 1$ the value for the great majority of the showers being 1/40. It seems

that the showers which consist almost entirely of penetrating particles are probably the penetrating tail of air showers the soft electronic component of which had been absorbed higher in the atmosphere.

During the year a considerable amount of time was devoted by Nevin and McCusker in conjunction with two research students of University College, Dublin, A. Doyle and D. Keefe to design studies of an experiment to throw light on the existence of air showers of great extent and consequent great energy. The experiment involved the construction and subsequent study of a novel form of counter covering an area of approximately one square metre. The earlier form of counter consisted of a flat steel box containing twenty five wire hexagon counters. It was found possible to construct and seal the boxes to be free from air leaks over a long period. Information about the effect of various fillings was obtained and the behaviour of the counter was moderately satisfactory. In the end because of the interpenetration of the fields of the various counters the wire hexagons forming the cathode were replaced by conventional copper cylinders and the counter wires beaded with five small paraffin wax beads which effectively divided each long counter into six short ones. The resulting counters filled with 12 cm. argon and 0.9 cm. of purified ethyl formate have behaved in a very satisfactory manner indeed. Much electronic equipment required for the experiment including pulse shaping circuit, stabilized power supplies and two pulsed transmitters working on 176 megacycles per second were constructed during the year. In the experiment it is proposed to use counter arrays at the corners of an equilateral triangle connected by a V.H.F. radio link.

An experiment begun in the previous year, a cloud chamber study of penetrating showers from carbon, water and paraffin wax, by McCusker and Millar was completed. About five thousand photographs many of considerable interest, were obtained. A second experiment on the study of penetrating showers produced in a large tank of water which had been under preparation in the previous year was commenced early in the year under review. In this experiment a hodoscope arrangement of 31 channels

constructed in the school was used. Over seven thousand showers were recorded and the data punched on Hollerith cards. Examination of these records was in progress towards the end of the year. At the end of the year the apparatus was being changed over to study showers produced in paraffin wax.

During the year the workshop was fully engaged on the construction of experimental apparatus. The construction of the 15 kilowatt magnet was completed and the magnet finally assembled in position in one of the cosmic ray huts. Work on the cloud chamber and the control and safety equipment was in progress at the end of the year. Two of the counter trays for the large shower experiment were constructed in the workshop during the year. The other two were constructed in the workshop of the Physics Department of University College, Dublin.

3. LECTURES AND CONFERENCES.

A three day Colloquium on Cosmic Radiation took place on 25th, 26th and 27th of September, 1951. The principal lecturers were Dr. G. D. Rochester, Dr. E. P. George and Dr. C. O'Ceallaigh. The discussions centred round the problem of heavy mesons, the primary cosmic radiation, to which Professor Brück contributed, the decay and nuclear interaction of μ-mesons and nucleon cascades. An account of certain cosmic ray investigations at Harwell was given by Mr. Galbraith and Dr. Jelley. A contribution on the variation of cosmic ray intensity with depth was given by Dr. Barton and one on extensive showers underground by Mr. Sturgess, both members of Dr. George's team at Birkbeck. Mr. McCusker, Dr. Millar and Dr. Nevin spoke on the work of the Cosmic Ray Section. The attendance at the morning and afternoon sessions varied between thirty and forty.

Mr. McCusker and Dr. Nevin attended a conference on V-particles and heavy mesons at Bristol in December 1951.

4. PUBLICATIONS.

Contributions to Periodicals:

D. D. Millar: The transition effect of the extensive air showers. Nuovo Cim. VIII, No. 4, p.279, 1 April 1951.

C. B. A. McCusker and D. D. Millar: A note on the V-particle. Nuovo Cim. VIII, No. 4, p.289, 1 April 1951.

L. Jánossy and H. Messel: Investigation into the higher moments of a nucleon cascade. Proc. Roy. Ir. Acad. 54, A, 16, p.245, 1 May 1951.

Leonie Jánossy and H. Messel: On the calculation of average numbers for the electron photon cascade. Proc. Roy. Ir. Acad. 54, A 15, p.217, 1 May 1951.

C. B. A. McCusker and T. E. Nevin: A cloud chamber study of electronic component of extensive air showers. Proc. Roy. Ir. Acad. 54 A 13, 1 August 1951.

C. B. A. McCusker and D. D. Millar: The Density of the penetrating particles in extensive cosmic ray air showers. Proc. Phys. Soc. A 64, 915, 1 October 1951.

C. B. A. McCusker and H. Messel: Momentum spectrum of cosmic ray protons. Proc. Phys. Soc. A 64, 948, 1 October 1951.

Stencil Copy of Lecture Notes:

C. B. A. McCusker: Recent Progress in Cosmic Radiation - circulated 3 May 1951.

C. Geophysical Section

1. ACADEMIC STAFF AND SCHOLARS.

Senior Professor:	Leo W. Pollak, Director of the School.
Assistant Professor:	Thomas Murphy.
Research Associate:	P. J. Nolan.
Scholar:	Séamus G. Miller (left 5 December, 1951).
Senior Technical Assistant:	Thomas J. Morley.
Junior Technical Assistant:	Miss Nuala O'Brien (left 30 September 1951).

2. RESEARCH AND OBSERVATIONAL WORK.

Magnetic Survey of Ireland:

The astronomical work of the Ordnance Survey has been considerably delayed by the fact that due to world restrictions on raw materials Messrs. H. Wild in Switzerland have been unable to keep to the original delivery date of the theodolite. The Ordnance Survey Office received delivery of the Theodolite in June 1951 and the determination of the azimuths of the remaining five stations has been carried out by Captain Madden during the summer months. This completed the field work and the results of the magnetic survey of Ireland are being prepared for an extensive publication which is scheduled for autumn 1952.

At Whitsuntide magnetic measurements with a Vertical Field Variometer were taken by Mr. Murphy at seven stations over an anomaly north of Galway.

Experimental and Fieldwork:

(i) Seismological Investigation. At Whitsuntide weekend readings with the Cambridge portable seismograph were taken by Rev. Dr. R. E. Ingram, S.J., Associate of the School, and Mr. Thomas Murphy during the day and at night in the Physics Department of University College, Galway, with the permission and assistance of the President, Mgr. Dr. P. de Brún, Professor C. Ó Broicháin and Dr. D. Larkin. Readings were also made at several places from the west to the east coasts of Ireland.

(ii) Micro-meteorological Survey of Ireland. Professor L. W. Pollak and Mr. Thomas Murphy continued their micro-meteorological investigation with the mobile laboratory of the School. Many observations with the photo-electric nucleus counter were carried out at stations lying on large loops which cover Dublin City and the adjacent country. The equipment of this mobile laboratory has been supplemented by a barrage balloon Resistance Psychrometer, lent by the Meteorological Office, London.

(iii) High sensitivity Magnetometer. The Geophysical Section has received on indefinite loan from the Carnegie Institution of Washington for Mr. Murphy's investigation on rock magnetism a high sensitivity remanent magnetometer designed by Dr. H. E. Tatel, Washington. Only four instruments of this kind will be in operation: the prototype in Washington, the complete copy of the original instrument supplied to Dublin and two others to be built in Copenhagen and Tokyo with a few essential parts lent by the Carnegie Institution.

The Geophysical Section owes a great debt of gratitude to Dr. M. A. Tuve, Director, Department of Terrestrial Magnetism and Dr. V. Bush, President, Carnegie Institution of Washington for the loan of this most expensive and rare instrument.

Professor P. M. S. Blackett, Manchester, has visited the Section on several occasions in order to discuss problems in connection with Mr. Murphy's investigation on rock magnetism.

Meteorological Observatory:

The observations and records in 5, Merrion Square, on Leinster Lawn and in the grounds of Trinity College, Dublin, were continued throughout the year under review. The monthly meteorological summaries issued at the end of each month experience increasing appreciation. They are not only regularly reproduced in full or in extract by the daily papers in Dublin and the Irish provinces but also by English newspapers and are broadcast by Radio Eireann. The monthly Meteorological Bulletins are continued and distributed on an exchange basis and to interested Irish institutions.

A micro-meteorological station has been set up in Blackrock and is being operated by Mr. Murphy.

3. LECTURES AND DISCUSSIONS.

Meteorological and Geophysical Seminar:

The Seminar is held monthly, except in July, August and September, in the lecture room of the School at 7.30 p.m. and is regularly well attended.

The following lectures were delivered:

Dr. P. J. Nolan, University College, Dublin: On Thunderstorms.

Professor L. W. Pollak, School of Cosmic Physics: Pole Motion - Meteorological Causes and Consequences.

Dr. T. E. Nevin, University College, Dublin: Molecular Spectra in the Earth's Atmosphere.

Dr. H. E. Tatel, Carnegie Institution of Washington: Recent Geophysical Research in the United States.

Professor P. A. Sheppard, Imperial College of Science and Technology, London: Atmospheric Turbulence, Surface Drag and the General Circulation of the Atmosphere.

Professor L. W. Pollak and Thomas Murphy, School of Cosmic Physics: Sampling of Condensation Nuclei by means of a mobile photo-electric counter.

Professor L. W. Pollak, School of Cosmic Physics: A Recording Nuclei Counter (with demonstration of the instrument and its records).

Professor L. W. Pollak, School of Cosmic Physics: Demonstration of some modern meteorological instruments (Barrage Balloon Psychrometer, Hypsometer and Miniature Anemometer).

Dr. R. Fürth, Birkbeck College, London: On the Theory of Stochastic Phenomena and its Application to Meteorology.

Professor J. J. Dowling, University College, Dublin: Seismological Problems.

Dr. R. C. Geary, Director, Central Statistics Office, Dublin: The Uses and Abuses of Mathematical Statistics.

Dr. E. J. Öpik, Astronomical Observatory, Armagh: The Astronomical Theories of the Ice Ages.

Professor P. M. Quinlan, University College, Cork: Dimensional Analysis with Applications to Meteorology.

Courses of Lectures:

Professor Pollak gave courses of lectures on "Introduction to Dynamical Meteorology" and on "The motion in the Atmosphere" in University College, Dublin.

Mr. Thomas Murphy delivered a lecture entitled "The Magnetic Survey of Ireland" to the Dublin University Experimental Science Association in Trinity College, Dublin, on 4 March 1952.

4. STATUTORY PUBLIC LECTURE.

The Statutory public lecture of the School entitled "Electricity of Rain" was delivered by Dr. J. A. Chalmers of Durham University in the Physical Laboratory, Trinity College, Dublin on 20th February 1952, at 4.30 p.m. Attendance approximately 70 persons.

Collaboration with Bórd na Móna and Irish Ordnance Survey Office.

(i) On the request of Bórd na Móna a calibrated hand-anemometer has been procured from Germany for their experiments on drying of milled turf. These experiments which are considered of great national importance have also been supported by the Geophysical Section by supplying one of our rather expensive anemometer cup assemblies and integrating unit.

Several discussions on the the theoretical basis of the experiments undertaken by Bórd na Móna have taken place between a representative of the Board and Professor Pollak.

(ii) Triangulation and Levelling of Ireland. In connection with the proposed precise levelling of Ireland, Brig.-Gen. K. M. Papworth, Chief Survey Officer, Ordnance Survey Division, Belfast, visited the School on March 14, 1951. In the afternoon a conference was held in the School in which the setting up of a Tide Gauge on the West coast of Ireland was discussed. Those present were: Brig. K. M. Papworth, Belfast; Lt.Col. J. E. Nolan, Ordnance Survey Office, Dublin; Professor L. W. Pollak and Mr. Thomas Murphy of the School of Cosmic Physics.

5. PUBLICATIONS.

(1) Geophysical Memoirs of the Dublin Institute for Advanced Studies.

No. 2 - Part 2: Measurements of Gravity in Ireland: Gravimeter Observations between Dublin, Sligo, Galway and Cork. By H. I. S. Thirlaway.

Published 1951. pp. 26 + 3 maps. Price 12s. 6d.

Summary: Results of gravity observations made between pendulum stations at Dublin, Sligo, Galway and Cork are described, together with a regional gravity survey of the province of Leinster and a small area centered on Kingscourt, County

Cavan. A Graf (Askania) gravimeter was used and stations were observed at 4 to 8 mile intervals.

Results are presented as Bouguer anomalies and the single traverses between the pendulum stations show regional trends of amplitude up to 20 mgals. due to anomalous masses at great depth.

No. 2 - Part 4: Measurements of Gravity in Ireland: Gravity Survey of Ireland North of the Line Sligo-Dundalk. By A. H. Cook and T. Murphy.

Published 1952. pp. 36 + 2 maps. Price 12s. 6d.

Summary: A gravity survey has been carried out with a small GRAF gravimeter in Ireland north of a line from Sligo to Dundalk. In all, 350 stations were established.

The Bouguer anomaly at each station was calculated. Low values of the anomaly were found over granite whose density, determined by measurements, is less than that of the surrounding rocks, mainly pre-Devonian. Estimates of the probable thicknesses of the larger granite masses lie between 14,000 and 43,000 feet. High values of the Bouguer anomaly measured in the Carlingford-Mourne area are explained as due to large bodies with densities about 3.0 g/cm.^{3} at depths in excess of 10,000 feet. It was found that the Tertiary Igneous Centres of Slieve Gullion and the Carlingford peninsula are positioned above some of these dense masses but in the Mournes there appears no simple correlation.

The similarity between the pattern of the Bouguer anomaly contours and WRIGHT's tectonic plan for north-eastern Ireland is pointed out. Explanations to account for the variations of gravity are based on this scheme and indicate that thicknesses between 4,000 and 8,000 feet of light sediments, thought to be mainly Triassic, are probably present in this area.

With the exceptions of two small areas on granite, the Bouguer anomaly is positive with a mean value about 20 mgals. The isostatic anomalies are also positive on any scheme of compensation.

(2) Geophysical Bulletins of the Dublin Institute for Advanced Studies.

No. 3: Frequency of the Centres of Closed Low Pressure Systems over the North Atlantic Ocean. By L. W. Pollak and Nuala O'Brien

Published 1951.

Summary: In a previous paper by L. W. POLLAK and Rev. P. O. TEDDE, S.J., it has been shown by applying the t-test and other methods that a solar influence on the frequencies of low pressure centres over the North Atlantic Ocean, at least in the latitudes between 50° and 60° N., is indicated.

The data used for the above investigation (and in the mean time considerably extended) have been tabulated in such a way that they could be combined to show the change

of storm frequency between any desired phase of the single or double sun spot cycle.

The tables give the frequency of the centres of relatively low pressure at 1300 G.M.T. for each day of the period 1899 to 1938 and are based on 14,600 weather maps.

No. 4: Density of Irish Rocks. By J. S. Jackson.
Published 1951.

Summary: The densities of 157 rock specimens in the Geophysics Laboratory of Trinity College, Dublin, have been determined to provide data for the evaluation and interpretation of the gravity survey of Ireland.

(3) Contributions to Periodicals.

L. W. POLLAK: Conversion of Hollerith Punch Card Machines for Use of Un-punched Cards. "Archiv für Meteorologie, Geophysik und Bioklimatologie", Series B; Vol.II (1951), No.5.

Summary: A quarter of a century ago the author designed an inexpensive punch board and he introduced in Czechoslovakia a system for decentralised punching of weather data known as "In-station-punching" which has since been adopted by several other countries including the United States of America and, quite recently, also by Great Britain. It is shown in this communication that with the aid of a simple, e.g. photo-electric attachment the present Hollerith punched card machines may be converted for processing of un-punched cards which have considerable advantages particularly in decentralised recording and in centrally working-up of weather data. The two essential parts of the attachment required for the conversion of a Hollerith sorter including a template for marking the cards by hand are described and depicted.

L. W. POLLAK: On the Systematic Influence in Series of Annual Rainfall Totals. Geophysical Publications of the Irish Meteorological Service, Vol.III, No.5; Dublin 1951.

Summary: Various proposed tests for systematic influence (or for randomness) are reviewed and augmented by a few contributions. Some of these criteria, chiefly HELMERT's, ABBE's and GOUTEREAU's, are applied to 127 long series of annual rainfall totals for 119 stations distributed over the globe. The results suggest that there is a certain persistence in the annual rainfall totals of successive years at some places. If we introduce as index of systematic influence the ratio of the difference between the actual and expected value of the criterion to its standard error and assume that an index larger than 3 is significant, nine places exhibit systematic influence. The indices derived by HELMERT's test are tentatively represented on a world map.

L. W. POLLAK and P. C. TEDDE: On the Frequency of Cyclones over the North Atlantic related to the Sunspot Cycle. Archiv für Meteorologie, Geophysik und Bioklimatologie, Series A, Vol.IV (1951).

Summary: C. J. KULLMER and H. H. CLAYTON found shifts in the latitude tracks of low pressure areas in North America with change in sunspot activity. These results called for an

extension of this investigation to other parts of the globe and this was all the more justified since no statistical tests of significance had been applied so far.

Frequencies of cyclonic centres for three solar cycles between 1899 and 1932 were subjected to a search for a relationship to the solar activity and the area investigated has been restricted to the North Atlantic. The results are based on 12418 weather maps for 1300 G.M.T.

The maximum frequency of the cyclonic activity occurs over the United States in a belt around 50°N which continues in approximately the same latitude up to 55°N and then over the Atlantic turns northwards. During 1899 to 1929, generally three belts of maximum frequency (in high, middle and low latitudes) appear in a single year. The movement of these belts along the mid-Atlantic seems to indicate a correlation to the solar activity.

The application of the t-test to the frequencies of low pressure centres over the North Atlantic indicates a solar influence at least in the latitudes 50° to 60°N.

L. W. POLLAK and Thomas MURPHY: Sampling of Condensation Nuclei by means of a mobile photo-electric counter. Accepted for publication by the editor of the "Archiv für Meteorologie, Geophysik und Bioklimatologie" on 15th September 1951.

Summary: A motor van was equipped with an improved photo-electric nuclei counter and samples of condensation nuclei were taken during travels in Ireland on 19 days. Nuclei measurements were made at 15 places in the Dublin area and at 19 stations during two traverses of Ireland and at the Atlantic Coast.

One noteworthy result deduced from observations made in polar air, is the uniformity of nuclei distribution over the whole of Ireland if contamination from nuclei produced by human activity is avoided. Another conspicuous feature, which was common to three consecutive days at the Atlantic Coast when there were passing showers in the morning, clearing afterwards and with the wind from the sea throughout, is the enormous fluctuation in the numbers of nuclei within a matter of minutes and from concentrations of about 100 nuclei per cm^3. up to as high as 206,000 per cm^3. within three quarters of an hour.

L. W. POLLAK: A Condensation Nuclei Counter with photographic recording. "Geofisica Pura e Applicata", Milano, Vol.22 (1952) Fasc. 1-2.

Summary: A condensation nuclei counter based on AITKEN's principle is described and depicted. It permits simultaneous observations of the graticule by two persons or the observation of the graticule by one person and the synchroneous photographic recording of the droplets. With one exposure, the droplets on 24 squares of the millimetre graticule can be recorded so that a repetition of the necessary operations required by other counters in order to obtain an average count becomes superfluous and the time taken for one experiment is reduced to three quarters of a minute. The limitation to five droplets per square mm. recommended for all hitherto existing nuclei counters with eye observations is removed when the droplets and the

graticule are photographed. By the use of a special sealing arrangement leakages are practically impossible. The glass windows of the receiver are interchangeable with plates of conducting glass which can be heated by the passage of an electric current. The receiver is equipped with a stirrer operated from outside by a permanent magnet. The method of measuring is discussed and examples of records are reproduced.

Note: An extensive exchange of publications with about 250 institutions and individuals over the whole globe is maintained. In this way the library of the Section receives most valuable contributions and is growing fast. It may be permitted to mention that our own publications, particularly those not published in journals are rather frequently requested, e.g. the U.S. Embassy has ordered six copies of each publication issued by the Geophysical Section which "are being forwarded to the Department of State for distribution to interested Washington Agencies".

Personalia:

(i) Professor L. W. POLLAK has accepted membership in the Scientific Committee (Editorial Board) of the International Review "Geofisica Pura e Applicata", Milano.

(ii) Professor L. W. POLLAK has accepted the nomination of the Governing Board of the School of Cosmic Physics that he should represent the Dublin Institute for Advanced Studies on the Irish National Committee of the International Union of Geodesy and Geophysics.

(iii) Mr. Séamus G. MILLER was engaged in collecting data for a climatology of Dublin City and assisted in the computation and analysis of magnetic measurements in Ireland. He left on the 5th December 1951 and took up a position in the Irish Meteorological Service.

D. MacGRIANNA
CLARÁTHÓIR

PÁDRAIG De BRÚN
CATHAOIRLEACH

26 Márta 1953