

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
1948-1949.

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

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for the Financial Year 1948/49

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, 1949.

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, 1949.

The report is presented under the following principal heads:-

- 1°. Constitution of the Council of the Institute and of the Governing Boards of the three Constituent Schools on the 31st March, 1949.
- 2°. Report of the Governing Board of the School of Celtic Studies.
- 3°. Report of the Governing Board of the School of Theoretical Physics.
- 4°. Report of the Governing Board of the School of Cosmic Physics.

1°. (a) Constitution of the Council of the Institute.

CHAIRMAN:

The Reverend Patrick Browne, M.A., D.Sc.;

EX-OFFICIO MEMBERS:

Mr. Michael Tierney, M.A.,
President, University College, Dublin;

Dr. Ernest H. Alton, M.A., Litt.D.,
Provost, Trinity College, Dublin;

Professor John J. Nolan, M.A., D.Sc.,
President, Royal Irish Academy.

MEMBERS APPOINTED BY THE GOVERNING BOARDS OF THE CONSTITUENT SCHOOLS:

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

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

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

Professor Albert J. McConnell, M.A., M.Sc., Sc.D., F.T.C.D.;

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

(b) Constitution of the Governing Board of the School of Celtic Studies on the 31st March, 1949.

CHAIRMAN:

Right Rev. Mgr. Patrick Boylan, D.D., M.A., D.Litt.;

SENIOR PROFESSOR:

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

APPOINTED MEMBERS:

Miss Eleanor Knott, M.A., D.Litt., M.R.I.A.;

Miss Áine de Paor, M.A., Ph.D.;

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

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

Liam Ó Buachalla, M.Comm., H.Dip. in Ed.;

Liam Ó Domhnaill;

Edward MacLysaght (Éamonn Mac Giolla Iasachta), M.A., M.R.I.A.,
D.Litt.;

Ernest Gordon Quin (Earnán Ó Cuinn), M.A., F.T.C.D.

(c) Constitution of the Governing Board of the School of Theoretical Physics on the 31st March, 1949.

CHAIRMAN:

Arthur W. Conway, M.A., D.Sc., Sc.D., LL.D., F.R.S.;

SENIOR PROFESSORS:

Erwin Schroedinger, M.A., Ph.D., D.Sc.;

Walter Heitler, Ph.D., F.R.S.;

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

APPOINTED MEMBERS:

Edmund T. Whittaker, Sc.D., LL.D., F.R.S.;

William H. McCrea, M.A., Ph.D.;

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

Albert J. McConnell, M.A., M.Sc., Sc.D., F.T.C.D.;

Alfred O'Rahilly, M.A., D.Sc., D.Phil., D.Litt.;

George R. Keating, M.Sc.;

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

(d) Constitution of the Governing Board of the School of Cosmic Physics on the 31st March, 1949.

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.;

Lajos Jánossy, Ph.D., M.R.I.A.

APPOINTED MEMBERS:

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

Walter Heitler, Ph.D., F.R.S.;

Eric M. Lindsay, M.A., M.Sc., Ph.D., F.R.A.S.;

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

Austen H. Nagle, A.R.C.Sc., B.Sc., D.I.C.;

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.

2°. Report of the Governing Board of the School of Celtic Studies

(1) ACADEMIC STAFF, SCHOLARS AND EXTERN RESEARCH WORKERS

Senior Professor:

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

Assistant Professors:

Brian Ó Cuív;

James P. Carney;

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

Miss Cecile O'Rahilly;

David Greene (appointed as from 1 April 1948).

Assistant:

Miss Sheila Falconer.

Scholars:

M. Louis Paul Némo (Roparz Hémon);

Rev. Cuthbert McGrath, O.F.M. (as from 1 April 1948).

Extern Research Workers commissioned by the School:

Dr. T. F. O'Rahilly;

Dr. R. I. Best;

Dr. Osborn Bergin;

Dr. D. A. Binchy;

Mr. Seán Mac Airt;

Mr. Liam Price, D.J.;

Mrs. Mary Ellen Carney;

Rev. Seán Ó Catháin, S.J.;

Rev. Shan Ó Cuív;

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

Rev. Pádraig Ó Súilleabháin, O.F.M.;

Professor J. Vendryès;

Mr. Heinrich Wagner.

(2) THE WORK OF THE SCHOOL

Preliminary investigation of the field to be covered by the proposed dialectal survey was carried out. In connection with the collecting and recording of the living Irish speech, for the purpose of compiling a comprehensive vocabulary, it was decided that the most urgent aspect of this work was the discovery and contacting of native Irish speakers living outside the Gaeltacht areas whose knowledge of the language was in more imminent danger of being lost than that of Irish speakers living in the areas where Irish was still the vernacular. A list of such speakers in Co. Cork had been compiled and contact had been established with many of the speakers listed by the end of the period under review. This work has been carried out by Mr. Brian Ó Cuív. A similar list of Irish speakers in the non-Gaeltacht areas of Co. Galway was being compiled and it was hoped that contact with Irish-speakers in that district would shortly be established. In this work the School is working in close collaboration with the Irish Folklore Commission, whose work has hitherto been confined to Fíor-Ghaeltacht areas.

A proposal that the School should take over and continue publication of the Mediaeval and Modern Irish Texts Series was considered and adopted. It was also decided that the School should undertake a series of transcripts from MSS. on the lines of Leabhair ó Láimhsgríbhinnibh already published under the editorship of Professor H. Gerard Murphy by the Publications Branch of the Department of Education.

Individual Lines of Research Work

Subjects of research by individual members of the academic staff and by scholars in the School included:-

Old and Middle Irish Genealogies, Personal and Family Names -

Dr. M. A. O'Brien;

Modern Irish Prose Texts in MSS. - Mr. Brian Ó Cuív, Mr.

David Greene;

Modern Irish Verse Texts in MSS. - Mr. James Carney;

Mediaeval and Arthurian Literature in Modern Irish MSS. -

Miss Cecile O'Rahilly, Miss Sheila Falconer;

Irish Franciscan Prose Texts of the 16th Century - Rev.

Canice Mooney, O.F.M.;

Irish Franciscan Verse Texts of the 16th Century - Rev.

Cuthbert McGrath, O.F.M.;

Welsh Texts in MSS. - Mr. David Greene;

Genealogical Material in Modern Irish and related historical

and linguistic material - Mr. James Carney;

Contemporary Irish Dialects and Vocabulary - Mr. Brian Ó Cuív,

Mr. David Greene;

Syntax and Dialects of Modern Breton - M. Roparz Hémon.

Revision of proofs and preparation of new material for publication

Progress was made with the various works in course of publication. Of the fourteen works in the hands of the printers three had been finally passed for press by the end of the period under review and their early publication was expected.

In addition to the revision of proofs and the preparation of new material for works already in course of publication at the beginning of the period under review, 'copy' for the text of the following new works was sent to the printers:-

Párliaimint na mBan, edited by Brian Ó Cuív;

Place-Names of Co. Wicklow - III, by Liam Price;

Irish Franciscan Texts Series:

Scáthán Shacramainte na hAithridhe, edited by

Rev. Canice Mooney, O.F.M.

Rialachas San Froinsias, edited by

Rev. Pédraig Ó Súilleabháin, O.F.M.

Parrthas an Anna, edited by

Rev. Anselm Faulkner, O.F.M.

(3) COURSES OF LECTURES

A course of lectures and discussions on various aspects of Celtic Studies was held during the period 12th to 16th July, 1948. Subjects dealt with included: Textual Problems of Irish Law, Irish Metrics, Sagas and Grammar, Ancient Welsh Poetry, Modern Breton. Visiting lecturers were: Professors Osborn Bergin, D. A. Binchy, Myles Dillon, Idris Foster and H. Gerard Murphy. Lectures were also delivered by the following members of the academic staff: Mr. J. Carney, Mr. David Greene and M. Roparz Hémon.

In November 1948 M. Hémon commenced a course of lectures on Modern Breton. Lectures are delivered twice weekly on Tuesdays and Thursdays during the university terms.

(4) STATUTORY PUBLIC LECTURE

The Statutory Public Lecture under the auspices of the School was delivered in University College, Dublin, on 20th January 1949, by Mr. James Carney. His subject was Suibhne Geilt and the Children of Lir.

/P.T.O.

3°. Report of the Governing Board of the School of Theoretical Physics.

(1) ACADEMIC STAFF, SCHOLARS and VISITING PROFESSOR:

Senior Professors:

Dr. Walter Heitler, Director of the School;

Dr. Erwin Schroedinger;

Dr. John L. Synge. (Appointed as from 1st September 1948).

Scholars:

Dr. A. Papapetrou. (Left September 1948);

Dr. S. T. Ma;

Dr. D. Basu;

Mr. G. Field. (Student without emoluments. Entered 22nd September 1948);

Mr. S. N. Gupta. (Student without emoluments. Entered October 1948);

Dr. M. Brdička. (Entered 22nd October 1948);

Dr. N. Symonds. (Entered 25th November 1948);

Dr. E. Corinaldesi. (Entered 7th January 1949);

Dr. Sheila Power. (Part-time without emoluments).

Technical Assistant:

Miss Mary Houston.

Visiting Professor:

F. D. Murnaghan, of the Johns Hopkins University, Baltimore,
U.S.A.

(2) SEMINAR and LECTURES:

Lectures to the Seminar during the year were almost exclusively concerned with recent developments in Quantum Electrodynamics. This was the title of a course given during April and May 1948 by Dr. Ma, and of another given in the Autumn term by Professor Heitler. This course was continued into January and was then taken over by Professor J. R. McConnell of St. Patrick's College, Maynooth. To conclude the series Professor Heitler described the new method of Regularization developed by W. Pauli. In

addition, Professor F. D. Murnaghan gave a series of six Seminar lectures on Elasticity, beginning on 26th May, and on 17th November Professor Synge gave a preliminary report on the results of his work on the Gravitational Field of a Particle.

Monday lectures were held during the Autumn term when Professor Synge spoke on the Method of the Hypercircle.

A steady attendance of about 15 was maintained; both Universities being represented by members of their staffs.

(3) STATUTORY PUBLIC LECTURES:

The Statutory Public Lectures under the auspices of the School were delivered in Trinity College, Dublin, on the 8th, 15th and 22nd of March and on the 3rd of May, 1949, by Professor J. L. Synge. The general title of the lectures was Science and Common Sense.

(4) COLLOQUIUM:

The 1948 Summer Colloquium began on 6th July and continued until 16th July. Lectures were given each morning by Professor F. D. Murnaghan (The Johns Hopkins University) on the subject, Theory of Group Representations. Professor Heitler, who had just returned from the United States, gave three lectures on the most recent work in Theoretical Physics which was being carried out in America. Dr. A. W. Conway also gave a lecture on Quaternion Treatment of the Fine-Structure of the Hydrogen Line-Spectrum.

The attendance at the Colloquium lectures averaged 22, including professors, lecturers and senior students, chiefly from Irish Universities.

(5) VISITING PROFESSOR:

Professor F. D. Murnaghan (The Johns Hopkins University, Baltimore) spent the months of May, June, July and August 1948 as Visiting Professor at the Institute. His main contribution

was, of course, the conducting of the Colloquium, but his Seminar lectures on Elasticity aroused considerable interest among students. Most of the senior students of the two University Colleges in Dublin attended regularly.

(6) GENERAL LINES OF RESEARCH WORK:

Dr. Heitler and his group worked on a variety of subjects in Quantum Electrodynamics, Meson Theory and Cosmic Radiation. A great part of this work was influenced by the experience gathered during his visit to the United States. In particular Dr. Heitler and Dr. Ma carried out a general investigation of collision problems by methods developed recently in America and Japan.

Dr. Corinaldesi and Mr. Field have studied the scattering of mesons by nucleons in higher orders, work which has become possible only recently with the help of the new methods.

Dr. Ma carried out an exhaustive investigation of the problem of vacuum polarization, resulting in new insight into this difficult matter.

Mr. Gupta has found a great simplification in the treatment of Quantum Electrodynamical problems by using the indefinite metric of Dirac, developed several years earlier in lectures at this Institute.

Dr. Basu extended his work on proton-neutron scattering and showed that all difficulties disappear by taking into account the damping effects.

Rev. Dr. McConnell of St. Patrick's College, Maynooth, who continues to work in close association with the School, investigated, partly in collaboration with Dr. Heitler, the self-energy of particles with integral spin, and showed that the self-energies of all particles are of the same order of magnitude.

Dr. Heitler, together with Dr. Jánossy of the School of Cosmic Physics, has carried out theoretical work on the

behaviour of fast nucleons; and they were able to show that the theory is in complete agreement with the observed absorption of nucleons and the experiments on the production of meson showers.

While Dr. Heitler was in America, Dr. Slotnick and he calculated the interaction between electrons and neutrons on grounds of meson theory and found that the result agrees fairly well with the measurements of Fermi. This work was completed after Dr. Heitler's return to Dublin and is also published as an Institute publication.

Dr. Symonds made a mathematical study of the algebras involved in particles with higher spins. He also continued his work on transformations of the wave equation corresponding to particles of arbitrary spin, in particular on their form in orthogonal curvilinear co-ordinates and in Riemannian and non-Riemannian spaces, represented by an orthogonal line element. The work brought to the fore interesting results concerning the operators of the moment of momentum and was still proceeding at the end of the period under review.

Dr. Brdička took up the problem of gravitational waves, pure or accompanied by electromagnetic waves. An interesting, exact solution was found of the type which Dr. Papapetrou had already pointed out. It consists of a plane sinusoidal gravitational wave filling the whole space, which in the large (i.e. apart from the corrugation by the waves) is Galilean, that is to say, flat and open. The field represents a true stress energy momentum tensor, being exactly the negative of that of a plane sinusoidal linearly polarized electromagnetic wave in the same direction and of the same wave length. This true tensor exactly compensates the gravitational pseudo-tensor and thus makes the solution possible.

Dr. Synge investigated the question of transforming away the so-called Schwarzschild singularity which appears in the

solution of the external gravitational field of a highly concentrated spherical mass according to Einstein's theory of gravitation. He obtained a different transformation from that previously given by Lemaitre, and found that both his method and that of Lemaitre lead to the surprising result that a gravitating particle must move faster than light, if Einstein's theory is pushed to its logical conclusion for the case of a gravitating particle which is a mathematical point of no size.

Dr. Synge is also working on a book dealing with the method of the hypercircle in function-space. This is a systematic method of approximate solution applicable to many boundary-value problems of mathematical physics, and has the advantage that the maximum error at any stage of the approximation is known. The book will discuss the geometry of function-space in general terms, with detailed applications to problems such as torsion and electrostatic capacity.

(7) PROFESSORS' ACTIVITIES:

Professor Heitler returned from Columbia University, New York, in July 1948, where he had been acting as Visiting Professor since January of that year, on leave of absence from the Institute.

Professor Schroedinger was Shearman Lecturer in the University of London in May 1948.

Professor Heitler lectured at the Bristol International Symposium on Cosmic Radiation in September, and attended, by invitation, the Cérémonies Langevin-Perrin in Paris in November 1948.

Professors Heitler and Schroedinger attended, by invitation, the Solvay Conference in Brussels in September 1948.

(8) PUBLICATIONS FROM THE SCHOOL:

The following papers were published from the School during

the year under review:-

- Papapetrou: Static Spherically Symmetric Solutions in Unitary Field Theory - Proc. R.I.A., 52 A 6, 69, 1948.
- Schroedinger: 2400 Jahre Quantentheorie - Ann. d. Phys., 3, 43, 1948.
- Basali: Probability Problems in Nuclear Chemistry II - Proc. R.I.A., 52 A 14, 191, 1949.
- Heitler: Theory of Meson Production - Rev. Mod. Phys., 21, 113, 1949.
- Gupta: Magnetic Polarizability of the Electron - Nature, 163, 686, 1949.
- Slotnick and Heitler: The Charge Density and Magnetic Moments of the Nucleons - Phys. Rev., 75, 1645, 1949.
- Ma: Relativistic Formulation of the Quantum Theory of Radiation - Phys. Rev., 75, 535, 1949.
- Ma: Vacuum Polarization - Phys. Rev., 75, 1264, 1949.
- Symonds: On the Motion of a Vector Meson in a Homogeneous Magnetic Field - Phil. Mag., 40, 636, 1949.
- Heitler and Ma: On the use of Canonical Transformations for Collision Problems - Phil. Mag., 40, 651, 1949.
- Synge: The Geometry of Many Dimensions - Math. Gazette, (in the press).
- Synge: The Gravitational Field of a Particle - Nature, 164, 148, 1949.
- Heitler: Cosmic Ray Mesons and Meson Theory. Report of Bristol Symposium, (in the press).
- McConnell and Heitler: On the Self-energy of Particles with spin 1 - Nature, 164, 218, 1949.
- Basu: Influence of Radiation Damping on Neutron-Proton Scattering at high energies - Proc. R.I.A., (in the press).
- Heitler and Jánosy: On the Absorption of Meson-producing Nucleons - Phys. Soc., 62 A, 374, 1949.
- Synge: Upper and Lower Bounds for the Solution of Problems in Elasticity, (in the press).

4°. Report of the Governing Board of the School of Cosmic Physics.

A. Geophysical Section.

(1) ACADEMIC STAFF:

Senior Professor:

Leo W. Pollak, Director of the School.

Assistant Professor:

Thomas Murphy. (Appointed 19 March 1949).

Research Associate:

P. J. Nolan. (Appointed 1 November 1948).

Senior Technical Assistant:

Thomas J. Morley.

Junior Technical Assistant:

Miss Nuala O'Brien.

Scholars:

Rev. P. G. Tedde, S.J. (Entered 1 October 1948).

Mr. P. R. Nolan. (Entered 1 November 1948).

(2) WORK OF THE SECTION:

Much of the Director's time has been taken up with supervising the installation of equipment and directing the work of the staff and scholars attached to the Section.

Observational routine and the recording instruments have been maintained throughout and the following additional instruments have been installed:- Campbell-Stokes Sunshine Recorder, Evaporimeter, Thermometers (on roof) and Actinometer (for measuring the radiation of sun and sky). The "Meteorological Bulletin" and the "Meteorological Summary" continue to be published monthly.

(3) COURSE OF LECTURES:

Professor Pollak gave three courses of lectures: "Physics of the Atmosphere", "Physical and Dynamical Meteorology" and "Thermodynamics of the Atmosphere".

(4) STATUTORY PUBLIC LECTURES:

Professor Pollak delivered two public lectures: "Waves in the Atmosphere and Long-Range Weather Forecasting" and "The Exploration of the Upper Atmosphere".

(5) RESEARCH WORK:

Professor Pollak investigated long-period fluctuations of the general circulation of the atmosphere. The basic material was supplied by the U.S. Weather Bureau and the necessary extensive clerical work is carried out with statistical machines and punch cards. He finished the "Eight-Place Supplement to Harmonic Analysis and Synthesis Schedules for three to one hundred equidistant values of empiric functions" which forms the third and last volume of his calculating tables for Fourier Analysis. It will be published as No.1, Parts 1 and 2 of the "Geophysical Memoirs" of the School of Cosmic Physics.

Mr. P. R. Nolan (with the co-operation of the Irish Sugar Company) began investigation of the possibility of seasonal forecasting of sugar-beet yield and its sugar content in Ireland. The investigation is proceeding.

Rev. Pietro G. Tedde, S.J., began investigation of the relationship between the number, size, electric charge and diffusion coefficient of atmospheric nuclei and meteorological elements in Dublin. The whole equipment for this investigation was kindly supplied by the Department of Experimental Physics of University College, Dublin, and was carried out under the direction of Dr. P. J. Nolan (U.C.D.). The investigation is continuing.

The School has collaborated in a preliminary gravity survey of Ireland which was undertaken by the Department of Geodesy and Geophysics of Cambridge University. Mr. Thomas Murphy, Assistant Professor of the Geophysical Section, has taken part in this work.

Preparations were made for the long overdue magnetic survey of Ireland, which is not only of scientific but also of practical value. Part of the necessary equipment has already arrived in the School.

B. Cosmic Ray Section.

(1) ACADEMIC STAFF:

Senior Professor:

Lajos Jánosy.

Assistant Professor:

Mr. C. B. A. McCusker. (Appointed 1 July 1948).

Research Associate:

Dr. T. E. Nevin. (Appointed 1 November 1948).

Scholars:

Dr. D. M. Ritson. (Entered 1 February 1949);

D. Millar. (On scholarship from St. Andrews).

(2) WORK OF THE SECTION:

(a) Experimental work: Investigations into the properties of extensive showers with special reference to the nature of the penetrating particles were carried out. Apparatus was built in the workshop of the School. The experiments are still in progress.

An electro-magnet for cosmic ray work is being built.

(b) Theoretical work: Investigation jointly with Professor Heitler into problems of Meson Theory were carried out. The results have been published since in the Proceedings of the Physical Society.

(c) Cascade Theory: Extensive tables of cascade showers were computed by Mrs. L. Jánosy.

(3) PUBLICATIONS:

Jánosy and McCusker: The Nature of Penetrating Particles in Air Showers - Nature, 163, 181, 1949.

Jánosy, Rossi and Hulsizer: The Primary Soft Component of Cosmic Radiation - Nature, 163, 246, 1949.

(4) CONFERENCES:

Professor Jánosy attended:-

(a) The International Conference on Nuclear Physics in Birmingham 1948.

(b) The Cosmic Ray Symposium in Bristol 1948.

Contributions by Professor Jánosy to the latter conference have appeared in a volume of Colston Research Papers Vol.I.

(5) LECTURE COURSES:

The course of lectures on "Elementary Particles" delivered in the Institute was concluded.

(6) CONTACTS WITH OTHER INSTITUTES:

Close contact was maintained with the research team in Manchester University working on extensive showers; also with the Colombo group (Professor Mailvaganam and Dr. V. Appapilai).

C. Astronomical Section, Dunsink Observatory.

(1) ACADEMIC STAFF:

Senior Professor:

Hermann Alexander Brück.

Chief Assistant:

Hugh Ernest Butler.

Assistant (Part-time):

Frederick Jones O'Connor.

(2) BUILDINGS AND INSTRUMENTS:

Most of the work of reconditioning Dunsink Observatory has been completed during the past year. A well equipped workshop and laboratories for optical and other work have been set up in the basement of the main building.

The dome on the roof of the main building has been re-covered and the 15-inch reflector in the dome has been entirely overhauled and made ready for observational work.

A photo-electric photometer for the measurement of stellar brightness has been constructed for the 12-inch refractor in the South dome. An attachment for the visual and photographic observation of the sun has been set up for the same telescope.

A steel platform has been erected over the roof of the Meridian Room to carry part of the new Solar Telescope. A number of optical and other parts for this instrument have been received on loan.

The "Anemometer House" has been repaired to serve as house for the Technical Assistant and as night-quarters for the part-time Assistant.

Some progress has been reported by the Perkin-Elmer Corporation with regard to the construction of the 36 inch Schmidt-Baker Telescope which when completed is to be operated jointly by the Armagh, Dunsink and Harvard Observatories. It is expected that the instrument will be ready to be transferred to Bloemfontein by the beginning of 1950.

(3) OBSERVATIONAL AND OTHER WORK:

A number of star-fields and nebulae have been photographed with the camera mounted on the 15-inch reflector. The 12-inch refractor has been used for visual and photographic observations of sunspots. It has been employed also for observations of a number of lunar occultations and of comets and other phenomena.

Photo-electric measurements of stellar brightness have been started with this instrument.

A series of infra-red spectrograms of stars which had been obtained at the Cambridge Observatory, has been reduced and discussed, and the same has been done with a series of high-dispersion spectrograms of the double star Beta Lyrae.

(4) LECTURES:

Two Statutory Public Lectures were delivered by Professor Brück on 2nd and 9th March 1949 in the Physics Theatre, University College, Dublin. The title was "Sunspots and their Effects".

Professor Brück took part also in a series of weekly discussions on "Problems of Astronomy and Cosmic Rays" which was held in the lecture room of the School.

Professor Brück has participated also in various discussions which took place during the first post-war meeting of the International Astronomical Union at Zürich. The meeting was attended by all members of the staff and has been of considerable importance for the planning of research programmes.

(5) VISITORS AND PUBLIC DEMONSTRATIONS:

The Observatory has been visited during the year by a considerable number of astronomers from Britain, the Continent and overseas, several of whom came in conjunction with the Zürich meeting of the International Astronomical Union. Arrangements for future co-operation in the field of research on solar prominences and flares were made with the Director of the High Altitude Observatory of Harvard University during his visit to Dunsink.

The Observatory is now open to the general public on the first Saturday of every month, when its main instruments are demonstrated and celestial objects are shown through one or

more of its telescopes if weather conditions permit such observations. Sets of transparent photographs of astronomical objects of general interest, which have been put up in the South dome, are on display at all times. About 1500 people have come out to the Observatory on "Visitors' Nights" since the Observatory was opened to the public in October, 1948. Various other arrangements have been made to satisfy popular interest in astronomy and to organise activities of amateur astronomers in Ireland.

D. Mac GRIANNA

CLÁRATHÓIR

PÁDRAIG De BRÚN

CATHAOIRLEACH

14 Márta 1950