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INSTITIÚID ÁRD-LÉIGHINN 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
1942-1943.

INSTITIÚID ÁRD-LÉIGHINN 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 1942-43.

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 on the
work and activities of the Institute and its Constituent Schools
for the financial year ending 31st March, 1943.

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 two Constituent
Schools, namely, the Institute for Advanced Studies (School of
Celtic Studies) Establishment Order, 1940, and the Institute for
Advanced Studies (School of Theoretical Physics) Establishment
Order, 1940, 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 two Constituent Schools on the 31st March, 1943.

The report is presented under the following principal heads:-

- 1°. Constitution of the Council of the Institute and
of the Governing Boards of the two Constituent
Schools on the 31st March, 1943.
- 2°. Report of the Governing Board of the School of
Celtic Studies.
- 3°. Report of the Governing Board of the School of
Theoretical Physics.

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

CHAIRMAN:

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

EX-OFFICIO MEMBERS:

Dr. Arthur W. Conway, M.A., D.Sc., Sc.D., LL.D., F.R.S.,
President, University College, Dublin;

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

Dr. R. I. Best, D.Litt.,
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 Thomas F. O'Rahilly, M.A., D.Celt.Litt.;

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

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

The vacancy caused by the death of Dr. William Edward Thrift on 23^o April, 1942 was filled on the 13^o May, 1942 by the appointment of Dr. Ernest H. Alton, the new Provost of Trinity College.

Professor Eoin MacNeill ceased to be a member on the 16^o March, 1943 and the vacancy caused was filled on the same date by the appointment of Dr. Richard I. Best, the new President of the Royal Irish Academy.

Professor Albert J. McConnell was appointed a member of the Council by the Governing Board of the School of Theoretical Physics on the 1^o May, 1942.

(b) Constitution of the Governing Board of the School of Celtic Studies on the 31st March, 1943.

CHAIRMAN:

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

SENIOR PROFESSORS:

Thomas F. O'Rahilly, M.A., D.Celt.Litt.;

Richard I. Best, D.Litt.

APPOINTED MEMBERS:

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

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.;

Ernest Gordon Quin (Earnán Ó Cuinn), M.A.

(c) Constitution of the Governing Board of the School of Theoretical Physics on the 31st March, 1943.

CHAIRMAN:

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

SENIOR PROFESSOR:

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

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.;

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

George R. Keating, M.Sc.;

Thomas Edwin Nevin, D.Sc.;

Charles H. Rowe, M.A., M.Sc.;

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

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

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

(1) PROFESSORS, STAFF and SCHOLARS.

Professors:

Dr. T. F. O'Rahilly, Senior Professor and Director of the School.

Dr. R. I. Best, Senior Professor.

Dr. M.A. O'Brien, Professor, took up duty in the School on the 1st July, 1942.

Miss Eileen M. Evans, Assistant Professor, continued on the staff of the School till the 20th May, 1942.

Assistants:

Mr. Brian Ó Cuív, a part-time Assistant in the School, was appointed full-time Assistant with effect as on and from the 16th July, 1942.

Mr. Seán Mac Airt.

Mr. James P. Carney.

Dr. Séamus Ó Hinnse.

Dr. Tomás de Bhaldraithe, took up duties as full-time Assistant with effect as on and from the 1st July, 1942.

Mr. Donn S. Piatt continued on the Staff of the School till the 9th May, 1942.

Mr. Risteárd B. Breatnach, a Scholar of the School until the 30th June, 1942, took up duties as part-time Assistant with effect as on and from the 16th July, 1942.

Miss Máire Mhac an tSaoi took up duties as full-time Assistant with effect as on and from the 16th November, 1942.

Extern Research Workers commissioned to work for the School:

Professor Osborn Bergin and Professor D. A. Binchy,

Reverend Father Canice Mooney, O.F.M.,

Mr. A. Martin Freeman,

Mrs. Doran (Nessa Ní Shéagháha).

Scholars:

Mr. Risteárd B. Breatnach continued as a Scholar in the School until the 30th June, 1942.

(2) ADDITIONS TO THE MEMBERSHIP OF THE GOVERNING BOARD:

In pursuance of the provisions of Section 7 of the Institute for Advanced Studies Act 1940 (No. 13 of 1940), the President of Ireland (Uachtarán na hÉireann), acting on the advice of the Government, appointed the following additional members to be appointed members of the Governing Board of the School with effect as on and from 5th March, 1943:-

Liam Ó Buachalla, M.Comm., H.Dip. in Ed.
Liam Ó Domhnaill
Edward MacLysaght (Éamonn Mac Giolla Iasachta),
M.A., M.R.I.A.
Áine de Paor, M.A., Ph.D.,
Ernest Gordon Quin (Earnán Ó Cuinn), M.A.

(3) SEMINAR IN PHONETICS:

The work, referred to in the previous report, of training and directing a small group of specially selected students to enable them to undertake work in the phonetic investigation of existing Irish dialects and the recording of the living Irish speech, was continued by Miss Eileen M. Evans of the Department of Phonetics, London University. The year of absence sanctioned by the authorities of her university for this work expired on 20th May, 1942; and unfortunately Miss Evans did not find it possible to arrange for the continuance of her phonetic work at the Institute for a further period.

During the last term of her Course on Phonetics, Miss Evans devoted herself almost exclusively to the

practical aspect of the work. For this purpose arrangements were made to bring native speakers from each of the main Gaeltacht areas to the Institute where the students were trained in the practical aspects of the work. At a later stage Miss Evans brought the students to reside for a short period in the Meath Gaeltacht where they had further opportunities under her direction of acquiring further practical experience of recording the native Irish speech.

Of the four special students who attended the full course, three, Mr. Brian Ó Cuív, Mr. Risteárd B. Breatnach and Dr. Tomás de Bhaldraithe, have, during the year under review, been carrying out special investigation in the living Irish speech of West Muskerry district (Co. Cork), of the Ring district (Co. Waterford), and of the Cois Fhairrge district (Co. Galway) respectively.

Miss Evans herself had commenced work on the phonetic investigation of the Irish dialect of Dún Caoin (West Kerry) with Dr. Séamus Caomhánach, a native speaker of the district at the beginning of her course of lectures in the Summer of 1941, and later with Miss Margaret O'Connor, a native speaker of the same district, who continued work with her until the end of the course in May, 1942. Miss Evans also spent some time in the Dún Caoin Gaeltacht in the end of March and the first half of April, 1942. Later she continued her investigation with native speakers of this Gaeltacht who had migrated to the Meath Gaeltacht.

(4) GENERAL LINES OF RESEARCH WORK:

Professor T. F. O'Rahilly prepared for the press his work on "The Two Patricks" which was published in June, 1942.

He continued work on his series of linguistic articles. Six of these articles were published in Ériu in November, 1942.

Professor O'Rahilly also continued work on his "Studies in Early Irish History", all of which is set up in type for some time and will soon be published.

Professor R. I. Best finished his work on the "Bibliography of Irish Philology and Manuscript Literature" which was published in November, 1942; and he continued his work on the "Book of Leinster".

Professor M. A. O'Brien continued his work on a "Corpus Genealogiarum Hiberniae" being a complete critical edition of all the older Irish genealogies, which he had already commenced before he was appointed to the Academic Staff of the School.

Professor Osborn J. Bergin and Professor D. A. Binchy continued their work on the revision of the English translation of the new edition of Thurneysen's Old Irish Grammar.

Mr. James P. Carney finished his work on "The Topographical Poems" (Ó Dubhagáin & Ó Huidhrín) which was published in February, 1943.

Since then he has been engaged in preparing a collection of poems on the various branches of the

Butler family.

Mr. Brian Ó Cuív commenced work on his "Phonetic Investigation of the Dialect of West Muskerry".

Mr. Seán Mac Airt continued his work of the "Leabhar Branach", which was already far advanced at the end of the period under review.

Dr. Tomás de Bhaldraithe commenced work on his "Phonetic Investigation of the Irish dialect of Cois Fhairrge".

Dr. Séamus Ó Hinnse commenced work on miscellaneous annals preserved in the Rawlinson Mss. Oxford and in two Phillips Mss. in the National Library of Ireland.

Miss Máire Mhac an tSaoi commenced work on the following Arthurian tales:-

Echtra Mhelóra; and
Ceiliúche Iosgaide Léithe.

Mr. A. Martin Freeman continued his work on the Annals of Connacht.

The Reverend Father Canice Mooney, O.F.M. continued his work on the "Smaointe Beatha Chríost (Meditationes Vitae Christi)".

Mr. Risteárd B. Breatnach continued his work on the "Phonetic Investigation of the Irish dialect of the Ring District", which he had already commenced before coming to the Institute.

Dictionary of Classical Irish:

Work was continued on the excerpting of words from various published texts in preparation for the editing and publication of a dictionary of Classical Irish. The following members of the Staff have been engaged from time to time on this excerpting work:-

Mr. Brian Ó Cuív;
Miss Maire Mhac an tSaoi;
Mr. James Carney; and
Mr. Donn S. Piatt.

(5) STATUTORY PUBLIC LECTURES

The Statutory Public Lectures for the year were delivered in the Physics Theatre, University College, Dublin, where, on the 19^o, 22^o and 24^o March, 1943, Professor Ifor Williams, D.Litt., of the University College of Bangor, North Wales, delivered three lectures on "Early Welsh Poetry".

(6) PUBLICATIONS FROM THE SCHOOL:

The following works were published from the School during the year under review:-

- No.
(1) Thomas F. O'Rahilly: The Two Patricks, a Lecture on the History of Christianity in Fifth-Century Ireland (83 pp.) — price 2/- — published by the Institute June, 1942.
(2) Ludwig Bieler: Codices Patriciani Latini (72 pp.) — price 2/- — published by the Institute September, 1942.
(3) R. I. Best: Bibliography of Irish Philology and Manuscript Literature — Publications 1913-1941 (254 pp.) — price 7/6 — published by the Institute November, 1942.

- No.
(4) Thomas F. O'Rahilly: A Hiberno-Scottish Family
(Ó Muirgheasáin, Morrison), published in
Scottish Gaelic Studies, Vol. V, Part 2,
pp. 101-105.
- (5) T. F. O'Rahilly: A Poem by Piaras Feirtéar
published in Ériu Vol. XIII - Part II
pp. 113-118.
- (6) T. F. O'Rahilly: Iarann, Larag, etc. published
in Ériu Vol. XIII - Part II, pp. 119-127.
- (7) T. F. O'Rahilly: Some Instances of Vowel
Shortening in Modern Irish, published in
Ériu Vol. XIII - Part II, pp. 128-134.
- (8) T. F. O'Rahilly: A Phonetic Development in
Munster Irish, published in Ériu Vol.
XIII - Part II, pp. 135-139.
- (9) T. F. O'Rahilly: -Genn for -Chenn published in
Ériu Vol. XIII - Part II, pp. 140-143.
- (10) T. F. O'Rahilly: Notes Mainly Etymological
published in Ériu Vol. XIII - Part II,
pp. 144-219.
- (11) James Carney: Topographical Poems (Ó Dubhagáin
and Ó Huidhrín) (159 pp.) - price 5/- -
published by the Institute February, 1943.
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3°. Report of the Governing Board of the School of Theoretical Physics.

(1) PROFESSORS, STAFF AND SCHOLARS.

Professors:

Dr. Erwin Schroedinger, Senior Professor and Director of the School.

Dr. Walter Heitler, Assistant Professor.

Scholars:

Mr. James Hamilton, M.Sc., part-time Scholar.

Dr. Hwan Wu Peng, Scholar.

Dr. Sheila Power, part-time Scholar.

Rev. Dr. James R. McConnell, Scholar.

(2) ADDITIONS TO THE MEMBERSHIP OF THE GOVERNING BOARD.

In pursuance of the provisions of Section 7 of the Institute for Advanced Studies Act 1940 (No. 13 of 1940), the President of Ireland (Uachtarán na hÉireann), acting on the advice of the Government, appointed the following additional members to be appointed members of the Governing Board of the School with effect as on and from 5° March, 1943:-

Professor George R. Keating, M.Sc.;

Dr. Thomas Edwin Nevin, D.Sc.;

Professor Charles H. Rowe, M.A., M.Sc.;

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

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

(3) LECTURES AND SEMINAR.

The Seminar and the course of lectures, both specified in detail in the previous report, were continued.

In the Seminar Dr. Heitler, after finishing

his exposition of the relation between the wave-aspect and the particle-aspect of the meson, went on to discuss in detail his and Dr. Peng's quantum theory of radiation damping especially with a view to its applications to collision processes involving mesons. After the summer-break, Dr. Schroedinger gave an extended introduction to the problem of the metrical field-equations of gravitation (with a view to the new Lagrangian proposed by G. Lanczos) followed by a report on the new affine field theory which had come forth from this very seminar-course.

The course of lectures continued to deal with advanced topics of quantum-mechanics. After the summer-break, Dr. Heitler started a new course (going on throughout the academic year 1942-43) with the aim of elucidating the quantum-theory of chemistry to research students of chemistry and of allied branches of science. This course had the highest attendance of all given hitherto. The first part of the lectures being an elementary introduction to wave mechanics, will be published in typescript.

(4) STATUTORY PUBLIC LECTURES.

Four Public Lectures were delivered by the Director in the Physics Theatre of the University of Dublin on the Fridays, February 5th, 12th, 19th, 26th, 1943, with the title "What is Life?" They dealt with the physical aspect of the living cell, notably with the bearing of quantum theory on the structure of chromosomes and on the nature of mutation. In order to satisfy an

audience which totalled nearly 400, only one-half of whom could be accommodated in the Physics Theatre at the Friday lectures, it was necessary to repeat the four lectures on the subsequent Mondays.

(5) VISITING PROFESSORS.

See (3).

(6) SUMMER COLLOQUIUM.

This name was adopted for a gathering of physicists on the same line as last year's "Summer Seminar", but amplified as regards the number of topics, of lectures and of lecturers, in particular by securing the collaboration of two distinguished visiting professors, P. A. M. Dirac (Cambridge, England) and Sir Arthur Eddington (Cambridge, England). The gathering lasted from 16th - 29th July, 1942. The number of participants was 43. The lectures were:-

- A. W. Conway: Quaternions 1843-1942. (2 lectures).
- P. A. M. Dirac: Quantum Electrodynamics. (5 lectures).
- Sir Arthur S. Eddington: Unification of Relativity
Theory and Quantum Theory.
(5 lectures).
- T. E. Nevin: The Measurement of Intensities of
Spectrum Lines by Photographic Methods.
(1 lecture).
- C. Ó Ceallaigh: Energy Losses and Scattering of
Fast Beta-Particles. (1 lecture).
- E. T. S. Walton: Some Problems associated with the
Production of fast Particles.
(1 lecture).

The lectures of P. A. M. Dirac and of Sir A. S. Eddington are about to appear in print as No. 1 and No. 2 respectively of the "Communications of the Dublin Institute for Advanced Studies, Series A."

(7) GENERAL LINES OF RESEARCH WORK.

The two lines of attack on the problem of elementary particles and fields were continued.

The work of Heitler, Peng and Hamilton was, during the period under consideration, devoted to fructifying their general theory of radiation damping reached earlier, as an attempt at avoiding the fundamental difficulties involved in the quantization of physical fields. The main object of this work was the application of the theory to the various elementary processes occurring in cosmic radiation, as it traverses the earth's atmosphere, and to form therefrom a clear and comprehensive picture of this complicated phenomenon, as observed on the earth in various altitudes and latitudes. In particular it has been possible to give a full account of the creation of mesons in the highest parts of the atmosphere by the particles arriving there from the universe. The agreement of the theoretical results with observation is very satisfactory and thus corroborates the soundness of the basic theoretical assumptions.

Schroedinger, following another line, has succeeded in founding the theories of gravitation and of electrodynamics on one unitary principle (affine geometry), with a prospect of including also the mesonic field. The new aspect is very attractive, formally satisfactory and, if tenable, it solves one of the central problems of physics. There is promising evidence of its consequences

being borne out by existing observations. But judgment must be suspended, till the connection with quantum-mechanics is secured.

The Reverend James R. McConnell has made a first step in this direction by the quantization (for weak fields) of the Born-Infeld-electrodynamics, which is the simplest electrodynamics suggested by the new field-theory and all but forms part and parcel thereof.

Miss Sheila Power devoted her time to working out the connection, hitherto not noticed, between a well-known theorem in the theory of black radiation and an equally well-known quantum mechanical method (W. K. B - approximation).

Much of the work, reported here, is not yet evidenced in the following list of publications, since the corresponding papers were read (or delivered for print) only at a later date.

(8) PUBLICATIONS FROM THE SCHOOL.

The following papers were published from the School during the period of report:

No.

9. E. Schroedinger. Dynamics and Scattering Power of Born's Electron. Proc. R. I. Acad. 48, (A), pp. 91 - 122, 1942. (read 22 June, 1942)
10. E. Schroedinger. Pentads, Tetrads and Triads of Meson-Matrices. Proc. R. I. Acad. 48, (A), pp. 135 - 146, 1943. (read 9 Nov., 1942)
11. W. Heitler and H. W. Peng. Anomalous Scattering

- of Mesons. The Physical Review, 62, pp.
81 - 82, 1942. (Received 22 May, 1942)
12. W. Heitler. On the Particle Equation of the Meson.
Proc. R. I. Acad. 49, (A), pp. 1 - 28, 1942.
(Read 9 Nov., 1942)
13. E. Schroedinger. Systematics of Meson Matrices. Proc.
R. I. Acad. 49, (A), pp. 29 - 42, 1943.
(Read 14 Dec., 1942)
14. E. Schroedinger. The General Unitary Theory of the
Physical Fields. Proc. R. I. Acad. 49, (A),
pp. 43 - 58, 1943. (Read 25 Jan., 1943)

D. MacGRIANNA
CLÁRATHÓIR

PÁDRAIG DE BRÚN
CATHAOIRLEACH

31^o Márta, 1944.