

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
1943-1944.

INSTITIÚID ÁRD-LÉIGHINN BHAILE ÁTHA CLIATH
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Annual Report of the work of the Institute and its
Constituent Schools presented by the Council for the
Financial Year 1943-44.

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, 1944.

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, 1944.

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, 1944.
- 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.

(b) Constitution of the Governing Board of the School of Celtic Studies on the 31st March, 1944.

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., D.Litt. ~~Ph.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, 1944.

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.;

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

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

/P.T.O.

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.

Assistants:

Mr. Brian Ó Cuív.

Mr. Seán Mac Airt.

Mr. James P. Carney.

Dr. Séamus Ó Hinnse continued on the staff of the School until 2nd October, 1943.

Dr. Tomás de Bhaldraithe continued on the staff of the School until 15th November, 1943.

Mr. Risteárd B. Breatnach continued on the staff of the School as a part-time extern Assistant until 22nd April, 1943.

Miss Máire Mhac an tSaoi continued as a full-time Assistant until 15th November, 1943, when she was appointed a Scholar in the School.

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 (Neasa Ní Sheaghda);

Miss Sheila Falconer;

Reverend Lambert McKenna, S.J.;

Most Reverend Dr. Michael Sheehan;

Dr. Séamus Ó Hinnse as on and from 3^o October, 1943;

Dr. Tomás de Bhaldraithe as on and from 16^o November, 1943;

Mr. Risteárd B. Breatnach as on and from 23^o April, 1943.

Scholar:

Miss Máire Mhac an tSaoi was awarded a Scholarship in the School for one year with effect as on and from 16th November, 1943.

(2) GENERAL LINES OF RESEARCH WORK.

Professor T. F. O'Rahilly continued work on his "Studies in Early Irish History and Mythology".

Professor R. I. Best continued his transcription of 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.

Professor Osborn Bergin and Professor D. A. Binchy continued their revision of the English translation of Thurneysen's Old Irish Grammar. Two-thirds of the text of this work is now set up in type.

Mr. Brian Ó Cuív continued work on his "Irish of West Muskerry", a phonetic study of the dialect of West Muskerry, Co. Cork. This work was well advanced at the end of the year under review and has since been published.

Mr. Seán Mac Airt completed his edition of "Leabhar Branach", which was published on 4th February, 1944. He then began work on a critical edition of the "Annals of Innisfallen".

Mr. James P. Carney continued the preparation of an edition of poems on the various branches of the Butler family.

Dr. Tomás de Bhaldraithe continued work on his phonetic investigation of the Irish of Cois Fhairrge, Co. Galway. The work was not quite completed when Dr. de Bhaldraithe resigned from his position in the School in November, 1943, but he continued it as an extern worker.

Dr. Séamus Ó Hinnse continued work on his edition of unpublished Irish Annals preserved in a MS. in the Bodleian Library, Oxford, and in two Phillipps MSS. in the National Library of Ireland. He continued this work after his resignation from the Academic Staff of the School in October, 1943.

Miss Máire Mhac an tSaoi continued her transcription of two Arthurian tales - "Eachtra Mhelóra" and "Céilidhe Iosgaide Léithe". The first of these was well advanced at the end of the period under review and has since been sent to the printers.

Mr. A. Martin Freeman continued his work on "The Annals of Connacht". Most of this work was printed off before the end of the year under review, and it was published soon afterwards.

The Most Reverend Dr. Michael Sheehan completed the revised and enlarged edition of his work "Sean-Chaint na nDéise" which was published on 30th March, 1944.

The Reverend Father Lambert McKenna, S.J., commenced work on "Bardic Syntactical Tracts".

The Reverend Father Canice Mooney, O.F.M., continued his work on "Smaointe Beatha Chríost (Meditationes Vitae Christi)". This work was almost ready for publication at the end of the year under review.

Mr. Risteárd B. Breatnach continued his Phonetic Investigation of the Irish of Ring, Co. Waterford.

Professor Ifor Williams prepared for publication his lectures on "Early Welsh Poetry", which he had delivered under the auspices of the School in March, 1943.

Miss Sheila Falconer commenced work on the transcription of the Irish translation of 'The Quest of the Holy Grail'.

Dictionary of Classical Irish.

The following members of the staff continued the excerpting of words from various published texts for the proposed Dictionary of Classical Irish:-

Mr. Brian Ó Cuív;
Miss Máire Mhac an tSaoi;
Mr. James P. Carney.

(3) STATUTORY PUBLIC LECTURES.

The Statutory Public Lectures for the year were delivered in the Graduates' Memorial Building, Trinity College, Dublin, on the 15th and 16th March, 1944, by Professor John Macdonald of the University of Aberdeen. The title of the lectures was "Scottish Gaelic and its Literature".

(4) PUBLICATIONS FROM THE SCHOOL.

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

- (12) Seán Mac Airt: Leabhar Branach. (454 pp.) — price 12/6. — published by the Institute, February, 1944.
- (13) Most Rev. M. Sheehan: Sean-Chaint na nDéise. (231 pp.) — price 5/- — published by the Institute, March, 1944.

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

(1) PROFESSORS AND SCHOLARS.

Professors.

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

Dr. Walter Heitler, Professor.

Scholars.

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

Dr. Hwan-Wu Peng, Scholar. (Left 30th
September, 1943).

Dr. Sheila Power, part-time Scholar.

Rev. Dr. James R. McConnell, Scholar.

Rev. Dr. Pius Walsh, Scholar. (Entered 20th
Oct., 1943).

(2) DEATH OF PROFESSOR CHARLES H. ROWE.

Professor Charles H. Rowe, who was appointed a member of the Governing Board on the 5th March, 1943, died on the 4th December, 1943. The members of the Governing Board desire to place on record their sympathy with his relatives and their own deep sense of loss at the death of their distinguished colleague.

(3) LECTURES AND SEMINAR.

In the weekly Seminar, Dr. Heitler delivered an extended report on the question of meson-production and cosmic radiation, dealt with in the papers

published by Peng, Hamilton and himself. First, in the Summer term, he gave a survey of the experimental facts, known about cosmic radiation, and outlined their theoretical explanation, as developed by him and his pupils. In the following term he gave a more detailed exposition of the theory of collision processes, meson-production, cascade-production of electrons, etc., as is believed to take place at different heights in the atmosphere.

After Christmas, Dr. Schroedinger delivered a course of lectures on Statistical Thermodynamics from both the classical and the quantum-mechanical aspect, with special reference to new ideas on the statistics of light-quanta which had come forth from the collaboration of Professor Born and a former Scholar of the School, Peng, in Edinburgh. The lectures were published by the School in a hectographed edition.

The special course of lectures dealing with wave mechanics and the quantum-theory of chemistry, which began in Autumn 1942, was continued up to the Summer vacation in 1943. This course, conducted by Professor W. Heitler, was intended for research students of chemistry and allied branches of science and was well attended by students of both Universities. The lectures on "Elementary Wave Mechanics" were published in a hectographed edition.

(4) STATUTORY PUBLIC LECTURES.

The statutory public lectures were delivered by Professor W. Heitler at University College, Dublin, on the 15th and 22nd February, 1944. The title of the lectures was "Measure of the Infinite".

(5) VISITING PROFESSORS.

See (6).

(6) COLLOQUIUM.

A Summer Colloquium which began on Wednesday, July 14th, 1943, and lasted for ten days, was attended by forty participants. The visiting professors included Professor Max Born of the University of Edinburgh, who lectured on "The Dynamics of Crystal Lattices", and Professor P. P. Ewald of Queen's University, Belfast, who delivered two lectures on "The Dynamical Theory of X-ray Interference". A very interesting account of the latest research work with X-ray photography was given by Dr. Kathleen Lonsdale of The Royal Institution, London. She lectured on the experimental study of "X-ray Scattering due to Thermal Motion in Crystals".

(7) GENERAL LINES OF RESEARCH WORK.

The work on Unified Field Theory was continued by finding the general foundation of the conservation laws and by generalising the affine connection so as to account for the three fundamental fields, viz., gravitation, electromagnetism and the mesonic field. Moreover, the problem of the "Born"-electron was solved, including gravitation and a weak "Yukawa" term. The superposition of two plane circular-polarised waves in Born's non-linear electrodynamics was found to admit of an exact solution. The possibility of discovering in the Earth's and in the Sun's magnetic fields a suspected weak YUKAWA-term was fully investigated.

The work by Hamilton, Heitler and Peng on production of mesons in cosmic radiation and on related problems was brought to a successful conclusion. It turned out that the theory led to a satisfactory understanding of a large number of phenomena of cosmic radiation.

As a further application of the theory of radiation-damping by Heitler and Peng, Dr. S. Power calculated the influence of damping on the Compton Effect and found that this influence was very small.

Rev. J. McConnell began an investigation on the negative proton, a particle which has so far not been detected by experiments but whose existence must be suspected from relativistic quantum theory. This work is still in progress.

P. G. Gormley of University College, Dublin, and W. Heitler examined the question as to what extent the theory of radiation-damping mentioned above is connected with Dirac's new quantum electrodynamics. They found that these two theories are not so closely related to each other as was previously believed and that in fact Dirac's quantum electrodynamics leads to serious difficulties which are not encountered in the theory of radiation-damping.

At the request of the Oxford University Press, Dr. Heitler prepared, during the winter 1943-44, a second edition of his book "Quantum Theory of Radiation".

(8) PUBLICATIONS FROM THE SCHOOL.

The following papers were published from the School during the period covered by the report:-

15. E. SCHROEDINGER. A new Exact Solution in Non-linear Optics. (Two-Wave System).

Proc. R.I.A. 49 (A). pp. 59-66.
(Read 12 April, 1943).

16. W. HEITLER and H. W. PENG On the Production of Mesons by Proton-Proton Collisions.
Proc. R.I.A. 49 (A). pp. 101 - 133.
(Read 10 May, 1943).
17. S. POWER. The Intensity Distribution of Proper Vibrations.
Proc. R.I.A. 49 (A). pp. 91 - 100.
(Read 24 May, 1943).
18. E. SCHROEDINGER. The Earth's and the Sun's Permanent Magnetic Fields in the Unitary Field Theory.
Proc. R.I.A. 49 (A). pp. 135 - 148.
(Read 28 June, 1943).
19. J. McCONNELL. Non-linear Quantum Electrodynamics of the Vacuum.
Proc. R.I.A. 49 (A). pp. 149 - 176.
(Read 28 June, 1943).
20. J. HAMILTON and H. W. PENG. On the Production of Mesons by Light Quanta and Related Processes.
Proc. R.I.A. 49 (A). pp. 197 - 224.
(Read 10 May, 1943).
21. J. HAMILTON, W. HEITLER and H. W. PENG. Theory of Cosmic-Ray Mesons.
Physical Review 64, pp. 78 - 94, 1943.
(Received 17 June, 1943).
22. E. SCHROEDINGER. The Point Charge in the Unitary Field Theory.
Proc. R.I.A. 49 (A). pp. 225 - 235.
(Read 8 November, 1943).
23. E. SCHROEDINGER. Unitary Field Theory: Conservation Identities and Relation to Weyl and Eddington.
Proc. R.I.A. 49 (A). pp. 237 - 244.
(Read 30 November, 1943).
24. H. W. PENG. On the Cascade Production of Mesons.
Proc. R.I.A. 49 (A). pp. 245 - 257.
(Read 30 November, 1943).
25. E. SCHROEDINGER. The Union of the Three Fundamental Fields (Gravitation, Meson, Electromagnetism).
Proc. R.I.A. 49 (A). pp. 275 - 287.
(Read 30 November, 1943).

26. J. McCONNELL and E. SCHROEDINGER. The Shielding Effect of Planetary Magnetic Fields.
Proc. R.I.A. 49 (A). pp. 259 - 273.
(Read 13 December, 1943).
27. W. HEITLER. Remarks on the Self-Energy Problem.
Proc. R.I.A. 50 (A). pp. 1 - 6.
(Read 14 February, 1944).

Hectographed Publications:

- W. HEITLER. Elementary Wave Mechanics.
(Introductory course of lectures
delivered 1942/43)
- E. SCHROEDINGER. Statistical Thermodynamics. (Course
of seminar lectures, delivered in
January-March, 1944)

Communications of the Dublin Institute for Advanced Studies
Series A.

- No. 1 QUANTUM ELECTRODYNAMICS by Paul A. M. Dirac.
No. 2 THE COMBINATION OF RELATIVITY THEORY AND QUANTUM THEORY
by Sir Arthur S. Eddington.

D. MacGRIANNA
CLÁRATHÓIR

PÁDRAIG DE BRÚN
CATHAOIRLEACH

9^o Márta, 1945