

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
1941-1942.

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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, 1942.

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 Second Council of the Institute and of the membership of the Governing Boards of the two Constituent Schools on the 31st March, 1942.

The report is presented under the following principal heads:-

- 1^o. Constitution of the Second Council of the Institute and of the Governing Boards of the two Constituent Schools on the 31st March, 1942.
- 2^o. Report on the administrative work of the Council.
- 3^o. Report of the Governing Board of the School of Celtic Studies.
- 4^o. Report of the Governing Board of the School of Theoretical Physics.

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

Pursuant to the provisions of Section 9, Subsection 4 (b) of the Institute for Advanced Studies Act, 1940, (No. 13 of 1940) the Taoiseach issued a certificate in writing under his hand that the Second Council of the Institute had been duly appointed as follows with effect as on and from the 12th day of February, 1942.

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. William Edward Thrift, M.A., Sc.D.,
Provost, Trinity College, Dublin;

Professor Eoin Mac Néill, 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 Erwin Schrödinger, M.A., Ph.D., D.Sc.,

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

Professor Erwin Schrödinger ceased to be a member of the Council on the 13th March, 1942, on which date a copy of his letter of resignation addressed to the Governing Board of the School of Theoretical Physics was received by the Council. The filling of the vacancy in the membership of the Council thus created was a matter for the Governing Board of the School of Theoretical Physics; and the actual filling of the said vacancy did not take place before the end of the Financial Year under review.

(b) Constitution of the Governing Boards of the two
Constituent Schools on the 31st March, 1942.

- (i) The Governing Board of the School of Celtic Studies
was constituted as follows:-

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:

Professor Eleanor Knott, M.A., Litt.D.;
Reverend Professor John Ryan, S.J., M.A., D.Litt.;
Reverend Professor Francis Shaw, S.J., M.A.

- (ii) The Governing Board of the School of Theoretical
Physics was constituted as follows:-

CHAIRMAN:

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

SENIOR PROFESSOR:

Erwin Schrödinger, 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.

2°. Report on the Administrative Work of the Council.

The Council, with the approval of the Minister for
Education given with the concurrence of the Minister for
Finance, appointed Mr. Domhnall MacGrianna, M.A., B.L., to
be the first permanent Registrar of the Institute.

The work of adaptation, furnishing and equipment to
suit the needs of the two Constituent Schools has been
completed as far as is possible in the present circumstances.
And the Council desires to place on record its deep

appreciation of the facilities placed at its disposal by the Minister for Posts and Telegraphs, the Commissioners of Public Works, and by the Comptroller of the Stationery Office, in the matter of equipment, supplies and stationery.

3°. Report of the Governing Board of the School of Celtic Studies.

(1) PROFESSORS, STAFF and SCHOLARS.

Professors:

Dr. Osborn J. Bergin, Senior Professor and Director of the School until his resignation both from the offices of Senior Professor and Director of the School on 2^o July, 1941.

Dr. T.F. O'Rahilly, Senior Professor, who was appointed Acting-Director of the School on 2^o July, 1941, and later on the 10^o November, 1941, was appointed Director of the School.

Dr. R.I. Best, Senior Professor.

Miss Eileen M. Evans, took up duty as Assistant Professor on the 21^o May, 1941.

Assistants:

Mr. James P. Carney, took up duties as Assistant (Class II) on the 3^o June, 1941.

Mr. Donn S. Piatt, took up duties as part-time Assistant (Class II) for three months on the 9^o February, 1942.

Mr. Brian Ó Cuív took up duties as part-time Assistant (Class II) on the 16th February, 1942.

Mr. Seán Mac Airt took up duties as full-time Assistant (Class II) in the School on 23rd February, 1942.

Mr. Séamus Ó Hinnse took up duties as part-time Assistant (Class II) in the School for a period of Six months on 23^o March, 1942.

Scholars:

Mr. Risteárd B. Breathnach, admitted as a Scholar of the School, commenced work on the 1st July, 1941.

(2) CHANGES IN THE GOVERNING BOARD:

The Governing Board desire to place on record its deep regret at the loss sustained by the School through the death of the Very Reverend Paul Walsh, B.D., M.A., D.Litt., on the 18th June, 1941.

Professor Osborn J. Bergin, D.Litt., resigned from the post of Senior Professor and Director of the School with effect as from the 2nd July, 1941.

Professor Daniel A. Binchy, M.A., Ph.D., B.L., resigned from the position of Chairman of the Governing Board of the School with effect as from the 2nd July, 1941.

The Right Reverend Monsignor Patrick Boylan, D.D., M.A., D.Litt., was appointed Chairman of the Governing Board of the School with effect as on and from the 31st October, 1941.

The Reverend Francis Shaw, S.J., M.A., was appointed a member of the Governing Board of the School with effect as on and from the 31st October, 1941.

(3) LECTURES AND SEMINAR:

Steps were taken to secure the services of Miss Eileen M. Evans, B.A., of the Department of Phonetics, London University, to train and direct 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.

Miss Evans, who was appointed Assistant Professor in the School took up duty on the 21st May, 1941, and commenced her course of lectures on phonetics on 3rd June, 1941.

The following students were specially selected by the Governing Board to attend the course:-

Mr. Brian Ó Cuív,
Mr. Risteárd B. Breathnach,
Mr. Tomás de Bhaldraithe,
Mr. Donn S. Piatt,
Mr. David Greene,
Mr. Eamonn Nally,
Mr. Séamus Caomhánach,
Mr. Tomás S. Ó Máille, and
The Reverend Denis Ó Floinn.

Others, including advanced students and lecturers in the two Universities, also attended the lectures, but did not take part in the practical work.

Owing to their professional duties, the Reverend Father Ó Floinn and Messrs. Greene, Nally, Caomhánach and Ó Máille were unable to continue the course in the Michaelmas Term.

(4) GENERAL LINES OF RESEARCH WORK.

Professor T.F. O'Rahilly continued work on his series of linguistic articles intended for publication in *Ériu*. He also commenced work on his "Studies in Early Irish History".

Professor R.I. Best continued his work on his "Bibliography of Irish Philology and Manuscript Literature" and also began work on the Book of Leinster.

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 prepared a transcript of the Sex Aetates Mundi from Rawlinson B. 502 under the direction of Professor R.I. Best. Later he commenced work on The Topographical Poems (Ó Dubhagáin & Ó Huidhrín) under the direction of Professor T.F. O'Rahilly.

The Reverend Father Canice Mooney, O.F.M., was commissioned to prepare and edit the following works for the School:-

- (a) "Smaointe Beatha Chríost" (Translation of the Meditationes Vitae Christi made about 1450 A.D.).
- (b) The following texts from Mss. in the Franciscan Library collection:-
 - (i) Irish Poems from Ms. A. 24 (Common-Place Book of Manus Ó Rourke);
 - (ii) Items 6, 7 and 9 from Ms. A. 31 (mainly topographical);
 - (iii) Item 9 from Ms. A. 33 (Fragment of Annals).

Mr. Donn S. Piatt commenced work on the excerpting of words for the proposed dictionary of Classical Irish.

Mr. Brian Ó Cuív commenced work on "Eachtra Conaill Ghulban" (Ms. 23. M. 10 and 23. M. 26 (R.I.A.)).

Mr. Seán Mac Airt commenced work on the "Leabhar Branach".

(5) STATUTORY PUBLIC LECTURE:

The Statutory Public Lecture for the year was delivered by the Director of the School in Trinity College, Dublin, on Friday, 20th March, 1942, with the title: "The Two Patricks". It dealt with the history of Christianity in fifth-century Ireland.

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

(1) PROFESSORS, STAFF and SCHOLARS

Professors:

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

Dr. Walter Heitler was appointed Assistant Professor and took up duty in the School on 24th June, 1941.

Scholars:

Mr. James Hamilton was admitted as a part-time Scholar and came to work in the School from 19th May to 30th September, 1941 (with a break in August when the Institute was closed).

Dr. Hwan-Wu Peng, admitted as a Scholar, took up work in the School on the 1st October, 1941.

Miss Sheila Power, admitted as a Scholar, took up part-time work in the School on 1st October, 1941.

Rev. Dr. James McConnell, admitted as a Scholar, took up work in the School on 1st March, 1942.

(2) LECTURES AND SEMINAR.

The two courses of lectures, mentioned in the last report, have been developed into two regular features for teaching and discussion, maintained since and going on weekly all the year round, with the breaks imposed by the vacations of the Universities. The first is:

The Seminar. Its scope is to unite the Staff and the Scholars of the School with the other physicists and mathematicians living in or near Dublin (mainly the Professors and the Lecturers of the two Colleges) in common reports and discussions of new research topics on the border-line of present knowledge. The second institution is:

A course of lectures, whose scope is, to convey in coherent and comprehensive résumées, of a monographic kind, the knowledge of such theories or theoretical methods as are needed or are likely to be needed in independent research work of the School.

In the period of the present report the main topics of the Seminar have been: the quantisation of systems containing equal particles and the quantisation of physical fields; Born's non-linear electrodynamics; the theory of the meson; the theory of radiation damping applied to the meson and a new point of view in field-quantisation, both worked out by Heitler

and Peng at the School. In the course of lectures the exposition of the principles of quantum-mechanics, mainly the theory of spin and the theory of perturbations was continued.

(3) STATUTORY PUBLIC LECTURE.

The Statutory Public Lecture was delivered by the Director at University College, Dublin, on Friday, 23rd May, 1941, with the title: "The Nucleus of the Atom". It dealt with the principal sources of our knowledge about the atomic nucleus and the nature of the forces operative within the nucleus.

(4) VISITING PROFESSOR.

On the 4th June, 1941, Professor P.P. Ewald of the Department of Mathematical Physics, the Queen's University of Belfast, delivered under the auspices of the School, in Academy House, Dawson Street, by kind permission of the Royal Irish Academy, a lecture on "Crystal Optics of X-Rays", in which the lecturer, inter alia, emphasized the intimate connection between the modern theoretical methods in this domain and the early work of W.R. Hamilton on geometrical optics.

(5) SUMMER SEMINAR.

Under this name a gathering of twenty-five physicists and mathematicians of Irish Universities was held from 16th—29th July, 1941. The main topic, the Meson Theory of the Nucleus, was set forth in 10 lectures by Professor W. Heitler. Professor E. Schrödinger in another 10 lectures, running parallel to the first course, dwelt on certain topics

of wave mechanics selected for the purpose of supplementing the main course and of facilitating its understanding.

(6) GENERAL LINES OF RESEARCH WORK.

. While the scope of all the work going on in the School may be summarized in a general way as directed on the investigation of elementary particles and fields and their mutual relations and interactions, on closer inspection two main lines of attack can be discerned. One is a thorough-going and very detailed investigation of the new phenomenon of the meson (being both a "particle" and a "wave-field"). On comparing detailed results of the provisionally accepted theory with the observational facts of cosmic radiation, both an elucidation of the latter phenomenon and a gradual improvement of the theoretical conceptions (so important for the understanding of the structure of the atomic nucleus) can be hoped for. The main fruits, hitherto obtained (by Heitler, Peng, Hamilton) are (i) the discovery of the important role of radiation-damping in the mesonic interaction, especially in the so-called multiple processes, and (ii) a most relevant general re-adjustment of the basic method of field-quantization, allowing its practical application in spite of its universally admitted unsatisfactory character.

A second line of attack was followed by Schrödinger, who during the period, continued his investigations on the classical field-equations in question (Maxwell's de Broglie's, Dirac's etc.), making a particularly extended study of M. Born's non-linear electrodynamics. Its concrete consequences, barred hitherto by mathematical obstacles, were revealed.

While mathematically estimable and physically hopeful results were obtained during the period of report, a really great success was reached along this general line only late in 1942 and therefore belongs to next year's report.

(7) PUBLICATIONS FROM THE SCHOOL.

The following papers were published from the School during the period of report. (The first column indicates the order number in the School's records).

- No. 2. E. Schrödinger. On the Solutions of Wave Equations for Non-Vanishing Rest-Mass including a Source-Function. Proc. Roy. Ir. Acad. 47. (A), pp. 1 - 23, 1941. (Read 21 April, 1941).
3. E. Schrödinger. Exchange and Spin. Proc. Roy. Ir. Acad. 47. (A) pp. 39 - 52, 1941. (Read 23 June, 1941).
4. E. Schrödinger. The Factorization of the Hypergeometric Equation. Proc. Roy. Ir. Acad. 47 (A) pp. 53 - 54, 1941. (Read 23 June, 1941).
- *5. W. Heitler. The Influence of Radiation Damping on the Scattering of Light and Mesons by Free Particles I. Proc. Camb. Philosoph. Soc. 37. pp. 291-300, 1941. (Received 16 February, 1941).
6. W. Heitler. Physical Concepts of the Meson Theory of the Atomic Nucleus. Nature, Vol. 148, pp. 680 - 683 (6 December, 1941).
7. E. Schrödinger. Non-Linear Optics. Proc. Roy. Ir. Acad. 47 (A), pp. 77-117, 1942. (Read 26 Jan. 1942).
8. W. Heitler and H.W. Peng. The Influence of Radiation Damping on the Scattering of Mesons II. Multiple Processes. Proc. Camb. Philosoph. Soc. Vol. 38, Part 3, pp. 296-312. (Received 14 Feb. 1942).

*(Paper No. 5, though published before Professor Heitler's appointment to the Institute, was included in the School's record partly for technical reasons, partly because of the intimate connection between No. 5 and No. 8).

D. MacGRIANNA

CLÁRATHÓIR

PÁDRAIG DE BRÚN

CATHAOIRLEACH

31^o Márta, 1943.