The Scottish Irish Mathematical Trail: People, Places, Practices

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ABSTRACT

We survey about 65 of the mathematical people with educational or career ties to both Scotland and Ireland, going back to the 1760s. The scope is broad, included pure and applied maths, astronomy, theoretical physics, maths physics, and statistics.

From James & William Thomson and Alice Everitt in distant times, to Philip Gormley, Sheila Tinney, Murray McBeath, Andrew Young, and Alisdair Wood from the past century, we'll explore many maths connections between Scotland and Ireland. Additional people (and all in more detail) can be found at the new blog at www.mathsireland.ie.

Travellers on the Scottish Irish mathematical trail



A panorama covering over 250 years

Includes mathematical people with educational or career ties to Scotland and Ireland, going back to the 1760s. It's very broad in scope, included pure and applied maths, astronomy, theoretical physics, maths physics, stats, etc.

Travellers on the Scottish Irish mathematical trail

Most obviously, we include:

1. Irish scholars who went to Scotland for education and/or employment: from James & William Thomson in the 1800s, to Liam O'Carroll and George Gettingby in modern times.

2. Scottish scholars who went to Ireland for similar reasons: from Peter Tait, George Slesser, and Charles Niven in the 1800s, to Gordon Lessells and Alastair Wood more recently.

3. People from elsewhere who spent significant stretches of time (3 or more years) in both countries: e.g., Joseph Everett, Edmund Whittaker, and Andrew Young.

4. People from one country who received honorary degrees from a university in the other country.

The best laid schemes o' mice an' men

Of course, it's research (solo or collaborative), and the dissemination of results, which are at the core of maths life.

One can also track Scottish attendence at meetings in Ireland down through the decades (e.g., Groups in Galway, DIAS conferences), or the Irish presence at key Scottish meetings (e.g., EMS colloquia, St Andrews Group Theory conferences).

Other benchmarks are scholarships, prizes, medals, awards, fellowships, editorships, memberships, holding high office, etc.

Trying to account for all of those beyond our abilities.

Questions to ponder:

1. Who got the better deal out of all this mathematical back and forth, Scotland or Ireland?

2. Who got the better deal, Scottish people who went to Ireland or Irish people who went to Scotland?

Our AIMM Is True

What follows is based on information buried in the online

AIMM: Annals of Irish Mathematics & Mathematicians

See the spin-off monthly blogs at www.mathsireland.ie.

And Tweets at @IrishMathsFacts (over 1000 followers).

Since late 2014, AIMM has tracked the academic profiles of thousands of Irish (or Irish based) people who pursued maths, dating back to the 1620s. Most are post-1800.

AIMM's reach is broad, embracing pure and applied maths, maths physics, theoretical physics, astronomy, and statistics, as well as actuarial science and maths education.

Over 900 relevant books are also documented in detail.

Philosophy: Shed Light on Hidden Figures

Leave no stone unturned, follow up on every lead or mention.

Process information received ASAP. Share freely: in the online "degree database" and in the more user-friendly monthly blogs.

Half of those blogs spotlight people associated with various cities and counties of Ireland: **Tyrone** (June 2021), **Offaly** (April 2021), **Clare** (February 2021), **Belfast** before 1900 (June 2018), etc.

Other blogs have geographical anchors that are further afield: Wales (July 2020), France (July 2019), Oxford before 1900 (March 2019), Illinois (January 2019), Boston (July 2018), Cambridge before 1900 (March 2018), etc.

Announcing: The Scottish/Irish Trail blog (July 2021).

Putting Scottish Education on the Map

The main institutions of learning of relevance to us today:



From top to bottom: Aberdeen, Robert Gordon, Dundee, St Andrews, Glasgow, Strathclyde, Heriot-Watt and Edinburgh. Not shown is the Royal Observatory Edinburgh.

Putting Irish Education on the Map

The main institutions of learning of relevance to us today:



From top to bottom: Coleraine, Jordanstown, Belfast, Galway, Maynooth, UCD, TCD, DIAS, DCU, Limerick, Cork.

Not shown are the observatories at Armagh and Dunsink.



James Thomson (1786-1849), born near Ballynahinch, Down, educated Glasgow, taught at Belfast Acad Inst (1814-1832) then lectured at Glasgow (1832-1849, provost). Wrote 10 books (on arithmetic, trigonometry, calculus, geometry, algebra, etc).

Physicist, mathematician and engineer William Thomson (*aka* Lord Kelvin, 1824-1907) born Belfast (son of James above), grew up there and in Glasgow. Educated Glasgow and Cambridge (2nd wrangler), career at Glasgow (1846-1907). Did pioneering work on heat, electricity and thermodynamics. His engineering insights led to the first successful transatlantic cable. Co-authored landmark book *Treatise on Natural Philosophy* (1867) with Peter Tait.



Owen McKenna (*aka* Eóghan MacCionnaith, 1891-1967) born Cork, educated UCC and Univ London, taught in Glasgow and Belfast, then lectured in English and Irish at Galway (1928-1961).

George Keating (1902-1973) born Dublin, educated at UCD and Edinburgh (1933-1934). Maths physics career UCD (1924-1972).

Astronomer Mervyn Ellison (1909-1963) born Fethard-on-Sea, Wexford, grew up there and in Armagh upon his father becoming director of the observatory. Educated TCD (DSc 1944). Career core at Royal Obs Edinburgh (1947-1958) and Dunsink & DIAS (1958-1963). Authored the book *The Sun and its Influence* (1955).



Analyst Dick Timoney (1909-1985) born Belleek, Fermanagh, educated UCD and Edinburgh. Career at UCD (1932-1979).

Analyst Phil Gormley (1910-1973) born Claudy, Derry, educated UCD and Edinburgh (PhD under Edmund Whittaker, 1933). Career at UCD (1933-1973).

Barry Spain (1914-2007) born Derry city, educated at TCD and Edinburgh (PhD in statistical mechanics under Klaus Fuchs, 1939). Career at Imperial, TCD and Sir John Cass College. 5 books.



Sheila Power Tinney (1918-2010) born Galway, educated UCD and Edinburgh (PhD under Max Born, 1941). Career DIAS and UCD.

Barbara Yates (1919-1998) born Dublin, grew up in Belfast. Educated TCD and Aberdeen (PhD on DE under Edward Wright, 1952+). First female Irish univ grad with pure maths PhD. Career QUB (1942-1945), Aberdeen (1945-1948), then Royal Holloway.

Astronomer Mary Conway (later Brück, 1925-2008) born Meath, educated UCD and Edinburgh (PhD under Mervyn Ellison, 1950). Career Dunsink (1947-1957), Royal Obs Edinburgh (from 1957 on) and Univ Edinburgh (1972-1987). Wrote several books.



Theoretical physicist Dick Carson (1930-2019) born Inishmore Island, Upper Lough Erne, Fermanagh. Educated QUB (PhD under David Bates, 1955). Career mostly at St Andrews (1960-1996). Supervised 10 PhD students.

Plasma physicist Jim Boyd born Larne, Antrim, educated QUB (PhD under David Bates, 1957), career included St Andrews (1965-1968). Supervised over 25 PhDs and wrote 7 books.

Algebraist Dermot McLain (1932-2004) born Coleraine, educated at QUB and Cambridge (PhD on groups under Philip Hall, 1956). Career started at Glasgow (1956-1960?), then Cardiff and Sheffield.



David Simms (1933-2018) born India, grew up Dublin, educated TCD and Cambridge (PhD on alg topology with William Hodge, 1960). Career Glasgow (1960-1964) then TCD (1964-2003). Wrote 2 books.

Maths physicist John Kennedy (1939-1995) born Belfast, educated UCD and London (PhD, 1964). Career Glasgow (c. 1964-1967) then UCD (1967?-1995). Supervised 4 PhDs.

Applied mathematician Cecil Graham (1939-2003) born Wexford, educated TCD, Brown and Glasgow (PhD under Ian Sneddon, 1966). Career mostly at Simon Fraser (BC), with stints at DIAS.



Statistician Iggy Ó Muircheartaigh born Dublin, educated UCD and Glasgow (PhD under John Aitchison, 1970). Career mostly at Galway (UCG/NUIG), also serving as its president.

Computational physicist Denis Weaire born India, grew up Belfast, educated Cambridge (PhD under Volker Heine, 1968). Career core Heriot-Watt (1974-1979), UCD (1980-1984), and TCD (1984-2007). 9 books and 12 PhD students. Known for Weaire/Phelan structure (1993) which improved on the Kelvin structure (1887).

Maths physicist Murrough Golden born Dublin, educated UCD and Edinburgh (PhD under Peter Higgs, 1970). Career mostly in public sector and at Kevin St Tech in Dublin. Authored 2 books.



Astronomer Jocelyn Bell Burnell born Lurgan, Armagh, educated Glasgow and Cambridge (PhD under Antony Hewish, 1969). Discovered pulsars. Career included Edinburgh Obs (1982- 1991).

Algebraist Liam O'Carroll (1945-2017) born Strabane, Tyrone, educated QUB (PhD under Bob McFadden, 1970). Career at Edinburgh (1971-2010), supervised 4 PhDs.

Applied industrial mathematician Sean McKee born Belfast, grew up in Edinburgh. Educated St Andrews and Dundee (PhD under Andrew Mitchell, 1970). Career included Dundee (1970-1972), and Strathclyde (since 1986). Supervised 25 doctorates.



Applied mathematician George Gettinby (1949-2014) born Larne, Antrim, educated QUB and Coleraine (DPhil with Andrew Young, 1974). Career at Strathclyde, 6+ PhD students and 2 books.

Th physicist Des Johnston born Belfast, educated Cambridge and Imperial (PhD under Hugh Jones, 1986), career at Heriot-Watt since 1990. Supervised 2 PhD students.

Statistician Johnnie Newell born Galway, educated Galway and Glasgow (PhD under Tom Aitchison, 1999). Career at Galway so far. Supervised 7 PhDs, co-authored book *Statistics for Sports and Exercise Science: A Practical Approach* (2010).



Algebraist John J. McDermott born Galway, educated Galway and Bath (PhD, 1997). Career St Andrews (1999-2016) then Dundee.

Theoretical physicist Sinéad Ryan born Cork, educated UCC and Edinburgh (PhD under Richard Kenway, 1996). Career mostly at TCD so far. Supervised 5 PhDs, head of school.

Statistician Nial Friel born Ballymote, Sligo, educated Galway and Glasgow (PhD under Ilya Molchanov, 1999). Career has included Glasgow (2002-2007) then UCD. Supervised 10 PhDs.



Topologist Brendan Owens, born Zambia, grew up Dublin. Edu TCD and Columbia (PhD, 2000). At Glasgow; 3 PhDs students.

Numerical analyst Aidan Naughton born Ballyhaunis, Mayo, educated Galway and UCC (PhD 2006). Career at St Andrews.

Algebraist David Quinn born in Ballinasloe, Galway, and grew up near Ballyleague, Roscommon. Educated Galway (PhD, 2009+). Career so far at Aberdeen (2012-2015) then Edinburgh.

Theoretical physicist Sam Palmer, educated TCD, Cambridge, Heriot-Watt (PhD under Christian Sämann, 2014). Career Dundee (2014-2017), Heriot-Watt (Malaysia) and Oxford.



William Trail (1746-1831) born Montrose, educated Aberdeen and Glasgow. After holding Chair of Maths (1766-1779) at Marischal College (which later merged merged with Univ of Aberdeen), he spent over 40 years in parish life in Antrim. Published a biography of Glasgow maths professor Robert Simson (1812).

Peter Tait (1831-1901) born Dalkeith, Midlothian, educated Cambridge (senior wrangler, 1852). Career Prof of Maths Queen's Belfast (1854-1860) then Edinburgh (1860-1901). 22 books.

George Slesser (1834-1862) born Buchan, Aberdeenshire, educated at Aberdeen, then Cambridge (senior wrangler, 1858). Career as Prof of Maths at Queen's Belfast (1860-1862).



Charles Niven (1845-1923) born Peterhead, Aberdeenshire, and educated at Aberdeen and Cambridge (senior wrangler, 1867). Career Prof of Maths at Queen's Cork (1867-1880), then Prof of Natural Philosophy at Aberdeen (1880-1922).

John McCowan (1863-1900) born near Stirling, educated Glasgow. Career included Royal College of Science in Dublin (1884-1888), then Dundee. Expert on fluid mechanics and the physics of surfing.

Astronomer Alice Everett (1865-1949, daughter of Joseph) born Glasgow, grew up there and in Belfast, educated at Girton. Career included Royal Observatory in Greenwich (1890-1895) and later research in optics and the engineering of early television (1920s).



William Guthrie (1905-1978) born Cowdenbeath, Fife, educated Edinburgh, Cambridge, and St Andrews (PhD on gaseous spectra, 1933). Career at St Andrews (1929-1933) and Magee College in Derry (1933-1968, principal). Largely interested in astronomy.

Murray MacBeath (1923-2014) born Glasgow, grew up Belfast. Educated QUB, Cambridge and Princeton (PhD under Emil Artin, 1950). Career included Bletchley Park (1943-1945) and two stints at Dundee (1953-1962, 1980s). Supervised 7 PhD students.

Algebraist Hans Schneider (1927-2014) born Vienna, grew up there and Edinburgh, educated at Edinburgh (PhD under Alec Aitken, 1952), career started at QUB (1952-1959).



lain Adamson (1928-2010) born Dundee, educated St Andrews and Princeton (PhD under Emil Artin, 1952). Career QUB (1952-1960) then Dundee (1966-1993?). Wrote several notable textbooks.

Lawrence Crane (1931-2021) born near Glasgow, educated there (PhD under Donald Pack, 1959). Career mostly TCD. Supervised 8 doctorates. Co-authored *Physical Fluid Dynamics* (1973).

Theoretical physicist Allan Solomon (1936-2013) born Glasgow, grew up Belfast, educated TCD, Cambridge and Sorbonne (PhD, 1963). Career included DIAS (1969-1971), then decades at The Open University (1971-2002).



Alastair Wood born Edinburgh, grew up Dundee, educated St Andrews (PhD in DE under Norrie Everitt, 1968). Second half of career at DCU. Supervised 9 PhD students. Co-authored book *George Gabriel Stokes: Life, Science and Faith* (2019).

Gordon Lessells born Fraserburgh, Aberdeenshire, educated at Aberdeen and Oxford. Most of career at UL (formerly NIHE Limerick) (1981-2015). Very active in Irish Maths Olympiad.

Algebraist Rod Gow born Glasgow, grew up in York, educated at Cambridge and Liverpool (PhD, 1973). Career mostly at UCD (1978-2013). Supervised 5 PhD students.



Algebraist Colin Walter born Glasgow, educated Edinburgh and Cambridge (PhD under J.W.S. Cassels, 1976). Career started at UCD (1977-1984).

Theoretical physicist Brian Dolan born Glasgow, raised Ardrosson. Educated Edinburgh and Durham (PhD, 1981). Career Glasgow (1983-1986) then Maynooth & DIAS. Supervised 4 PhD students.

Astronomer Simon Jeffery born Newcastle-upon-Tyne, grew up in Edinburgh, educated Imperial and St Andrews (PhD under Dick Carson, 1982+). Career St Andrews (1982-1996) then Armagh. Also adjunct prof TCD (2010-2018, 2021-). Supervised 15 PhDs.

Wanderers: others who spent time in both countries



Joseph Everett (1831-1904) born in Ipswich, educated at Glasgow. Career included stints at Windsor (Nova Scotia, 1859-1864) and Glasgow (1864-1867), where he worked in Kelvin's lab, and Prof of Natural Philosophy at Queen's Belfast (1867-1897). Wrote 4 books and contributed maths to the *Educational Times*.

Mathematical physicist and astronomer Edmund Whittaker (1873-1956) born Southport, Merseyside. Career core at TCD (Prof of Astronomy and Royal Astronomer of Ireland, 1905-1911), and Edinburgh (1911-1945). Advised de Valera on setting up of DIAS.

Wanderers



Astronomer Hermann Brück (1905-2000) born Berlin, second half of career included Dunsink & DIAS (1947-1957), then Royal Obs Edinburgh and Edinburgh (1957-1975).

Andrew Young (1919-1992) born Edentown, Lancs, educated St Andrews and Liverpool. Second half of career at UU Coleraine (1968-1983), supervising 21 doctorates in applied maths (biomaths approaches to population dynamics, numerical analysis and OR).

Maths physicist Tigran Tchrakian born London, educated Imperial and Edinburgh (PhD under Nicholas Kemmer & David Candlin, 1967). Career Maynooth and DIAS. Supervised 4 PhDs.

Wanderers



Theoretical physicist Jon-Ivar Skullerud born Oslo, educated Trondheim and Edinburgh (PhD under Brian Pendleton, 1996). Career includes TCD (2003-2007) and Maynooth since then. Supervised 3 PhD students.

Theoretical physicist Michael Peardon, born Macclesfield, educated Cambridge and Edinburgh (PhD under Ken Bowler & Pendleton, 1995). At TCD since 2000. Supervised 6 PhDs. Wrote 1 book.

Analyst Spyridon Dendrinos born Greece, educated Cambridge and Edinburgh (PhD under James Wright, 2005). Career included a brief stint at Glasgow (2010); at UCC since 2014.

Long Distance Irish Education

AIMM also documents the thousands of doctoral students of Irish mathematicians, no matter where from, or where they pursued their research.

Over a hundred of these have Scottish connections.



The earliest known is Robin Schlapp (1899-1991), born Edinburgh, educated there and at Cambridge (PhD on "Waves In A Stratified Media" under Joseph Larmor, 1925). Career at Edinburgh, author of *The Contribution of the Scots to Mathematics* (1973).

Toils Obscure

Other less visible ways that mathematicians contribute to the practice of the profession is by being appointed to appointment boards and as external examiners.

In the later category, here are some of the people with Scottish associations who have served in that role for Irish universities:

W.L. Edge (Edinburgh),
Walter Ledermann (St Andrews),
Milne Anderson (born Falkirk, educated Glasgow),
Robert Rankin (Glasgow),
John Howie (Stirling, St Andrews),
Jim Clunie (born St Andrews, educated there and Aberdeen),
Colin Campbell (St Andrews).

A similar (imcomplete) list could be made of Irish associated maths people who have been external examiners for Scottish universities.

Honorary degrees: higher rank than a' that



James Thomson (1786-1849): Glasgow LLD 1829.

George Stokes (1819-1903): Edinburgh LLD, Glasgow LLD, Aberdeen LLD (1886), TCD LLD. [Sligo born mathematical physicist, Cambridge career, hydrodynamics pioneer. 3 books.]

George Salmon (1819-1904): Edinburgh DD 1884. [Dublin born, career at TCD. Wrote many influential textbooks on higher level algebra and geometry.]

William Thomson (1824-1907): many, e.g., Glasgow LLD (1896).

Peter Tait (1831-1901): QUI DSc 1875.

Honorary degrees: higher rank than a' that



Osborne Reynolds (1842-1912): Glasgow LLD 1884. [Belfast born, and Dedham, Essex raised. Fluid dyn pioneer. Career Manchester.] Charles Niven (1845-1923): QUI DSc 1880.

John Perry (1850-1920): Glasgow LLD 1901. [Londonderry born mathematician and engineer, during Glasgow stint he successfully challenged Kelvin on the subject of thermal conductivity.]

Joseph Larmor (1857-1942): St Andrews, Glasgow LLD (1901), Aberdeen. [Antrim born theoretical physicist, career at Cambridge. Studied electricity, dynamics, and thermodynamics.]

Honorary degrees: higher rank than a' that



Alexander Anderson (1858-1936): Glasgow DSc 1901. [Coleraine born theoretical physicist, career at Galway (president).]

Edmund Whittaker (1873-1956): NUI DSc 1939.

John L. Synge (1897-1995): St Andrews LLD 1966. [Dublin born, career included Toronto and DIAS, distinguished relativist.]

Hermann Brück (1905-2000): NUI DSc 1972 & St Andrews DSc 1973.

David Bates (1916-1994): NUI DSc (1975), TCD ScD (1979), Glasgow LLD (1979) [Tyrone born maths physicist, career QUB.]

For a' That and a' That

BIG THANKS to:

1. Edmund Robertson & John O'Connor (St Andrews)

2. Scores of people in Ireland over the past half dozen years, especially Ted Hurley (NUIG), David Spearman (TCD), Gordon Lessells (UL), Mark McCartney (UU Jordanstown), Jim Boyd (Essex/ININ), Finbarr Holland (UCC), Tom Laffey (UCD), Olivia Bree (SPD).

3. Calmast (WIT) & Maths Week Ireland for image collage, for hosting www.mathsireland.ie, and for support in general.

4. The BSHM-CSHPM/SCHPM Conference organisers for the opportunity to give this presentation.

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