

A New Agenda ... Values, World Society, Modelling

<https://sites.google.com/site/gordonburmathsocsci/home/a-new-agenda>

A New Agenda seeks to explore all aspects of society using all the academic disciplines paying special attention to values ... with special interest in modelling ... not disinterested in practice ... and aspiring to high academic standards.

Commentary, May 2016

No. 29

Ireland, Trinity and mathematics – a *Values, World Society and Modelling* perspective

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Note that the following is purely my personal perspective from the outside: I have no association with Trinity College Dublin.

1 Mathematics across the Trinity disciplines – an outsider’s personal selection

Knowing that I shall be at Trinity in September for a conference, I have been looking at the Trinity website. Various items caught my attention as having relevance to my project on *Values, World Society and Modelling*.

Mathematics

Sinead Ryan’s comments on David Attis’ book – see Section 3 below.

http://www.tcd.ie/news_events/articles/new-book-outlines-how-trinity-mathematicians-shaped-modern-ireland/6051#.VltEkdLhBkh

Also: <https://www.tcd.ie/research/about/history/trinity-mathematicians-give-us-quaternions.php>

Statistics

Simon Wilson is head of Statistics: ‘Bayesian inference and decision theory, especially as with regard to streaming data, scalable algorithms (Big Bayes), adaptive utility and sequential decision making. Application areas include ecology, astronomy, social networks, risk and reliability.’

<https://www.scss.tcd.ie/disciplines/statistics/>

Knowledge and data engineering

Owen Conlon is head of Knowledge and data engineering: ‘the fundamental challenges and practical applications of knowledge-driven systems. Its research combines knowledge discovery, representation and reasoning with web-based data management and intelligent systems engineering.’

<http://kdeg.cs.tcd.ie/>

Psychology

David Hevey is Director of the Centre for Psychological Health which ‘applies the scientific methods and knowledge of psychology to enhance well-being, quality of life and optimal functioning in individuals and organisations, in both community and institutional settings’. This is very relevant to the values aspect of my project.

<http://psychology.tcd.ie/CPH.php>

Political science

Kenneth Benoit and Michael Laver on ‘Party policy in modern democracies’. Their work locates parties in policy space. In a less sophisticated way my own work refers to ‘political space’ – see Sections 5.1-5.3 and 6 below.

http://www.tcd.ie/Political_Science/ppmd/PPMD_11apr2006.pdf

Sociology

Richard Layte has a project ‘Trends in Socio-Economic Inequalities in Mortality Differentials in Ireland 1986-2006’. Again relevant to the values aspect of my project.

<http://people.tcd.ie/Profile?Username=layter>

Sociology

Andrew Finlay, Anne Holohan and David Landy are members of the Power, Conflict and Resistance cluster. ‘Virtual reality game to teach peacekeeping skills’.

<https://www.tcd.ie/sociology/research/>

<https://www.cs.tcd.ie/news/index.php?id=134>

Economics

John O’Hagan considers how to appraise the value of the Arts in Ireland. Again relevant to ‘values’.

https://www.tcd.ie/news_events/articles/weighing-up-the-value-of-the-arts-in-ireland/5945#.Vo0Dx8aLSU

Urban environment

Ainhoa González considers assessing the urban environment. Again relevant to ‘values’.

https://www.tcd.ie/news_events/articles/the-future-of-sustainable-urban-planning-requires-an-understanding-of-urban-metabolism/5053#.Vo0GNMaLSU

Natural environment

Jane Stout considers assessing Ireland’s ‘natural capital’. Once again relevant to ‘values’.

https://www.tcd.ie/news_events/articles/assessing-ireland-s-hidden-natural-capital-wealth-requires-collaboration-between-environmentalists-and-economists/4679#.Vo0HAMaLSU

Geography

Mary Bourke has developed a model of wind flow in 3 dimensions. Complex space-time dynamics are of great interest. There is a link here to Lewis Fry Richardson (a meteorologist as well as a peace researcher) who once asked, ‘does wind have a velocity?’

https://www.tcd.ie/news_events/articles/from-magilligan-to-mars-mapping-winds-and-dune-evolution-on-the-red-planet/6103#.Vo0BLcaLSUm

2 Creators of Mathematics: The Irish Connection

Irish Math. Soc. Bulletin 48 (2002), 65–68

<http://www.maths.tcd.ie/pub/ims/bull48/BR4801.pdf>

Creators of Mathematics: The Irish Connection edited by Ken Houston University College Dublin Press, Dublin, 2000, 150 pages, illustrations reviewed by Judy Grabiner, Flora Sanborn Pitzer Professor of Mathematics, Pitzer College, Claremont, CA 91711, USA, jgrabiner@pitzer.edu.

‘On the front cover of this book is a collage of photographs including likenesses of Lord Kelvin (from the statue in the Botanic Gardens in Belfast), George Boole, William Rowan Hamilton, and G. G. Stokes: distinguished company indeed, and a nice preview of the contents of the volume. Various authors have contributed short biographical-mathematical sketches of eighteen men who were Irish in origin or who worked and lived in Ireland. Although some of these men have been viewed, from far outside the British Isles, simply as part of the English-speaking mathematical community, and many of them went to school or taught in England or Scotland, the book shows the Irish Connection to have been crucial for many of their careers, whether through the support of family or local communities or Irish universities and academies.

What will the reader find in this short volume? The biographies are chronologically arranged, almost all from the nineteenth and twentieth centuries. Some authors are experts on the mathematician in question; others are mathematicians or colleagues with an interest in the particular individual. Fine portraits accompany most of the chapters. Readers will find a number of fascinating personal glimpses. Some of my own favourites are G. G. Stokes’s reference, in his mathematical analysis of waves, to the turbulent west coast of Ireland; F. Y. Edgeworth’s testing a statistical hypothesis by observing the traffic rates to and from a wasps nest in Edgeworthstown; 66 Book Reviews Andrew Young’s achievement, when horse racing was banned in the mid-1960s because of foot-and-mouth disease, in developing a computer simulation for the sports pages of the Daily Express, donating the royalties as prizes for students at Ulster and Liverpool; and P. B. Kennedy’s response to a hotel register’s query ‘Nationality’; with the words, ‘Irish, thank God’.

First in the list of biographies is Thomas Harriot (1560–1621), one of the most important mathematicians of his time. Harriot got into this book because he lived at Molanna Abbey in County Cork for a while near the end of the 16th century. Best known as associate of Sir Walter Raleigh and as author of *A Briefe and True Report of the New Found Land of Virginia*, Harriot contributed to the theory of equations, navigation, telescopic observation, and physics, being an independent discoverer of Snel’s law of refraction.

Moving to more modern times, we encounter some more familiar figures. Sir William Rowan Hamilton (1805–1865) was born in Dublin, studied at Trinity College, Dublin, held the Andrews Chair there and was also Astronomer Royal of Ireland, and was president of the Royal Irish Academy. The chapter includes a photograph of Brougham Bridge, Dublin, although all that remains is a plaque (ironically marred with graffiti) rather than Hamilton's original carving of the formula he discovered walking on the bridge. Robert Murphy (1806–1843), best known for his work on the theory of linear operations, was born in County Cork, and owes his admission to Gonville and Caius College, Cambridge, in spite of his lack of formal education, to a Mr McCarthy of Cork who was a junior fellow of that college. The logician George Boole (1815–64), though born in England and largely self-taught, became the first mathematics professor in what is now University College Cork. George Gabriel Stokes (1819–1903) was born in County Sligo and was educated there and in Dublin before attending Cambridge. George Salmon (1819–1904), best known for his textbook on the Conic Sections, was brought up in the city of Cork, matriculated at Trinity College Dublin, and was a tutor and lecturer there. John Casey (1820–1891), a self-taught mathematician specializing in the modern geometry of the triangle and circle, was born in the parish of Kilbeheny, was a student at Trinity College Dublin, and then was Professor of Mathematics at the Catholic University, later University College Dublin.

William Thomson, Lord Kelvin (1824–1907), though usually identified with Glasgow, was born in Belfast, son of a professor at the Book Reviews 67 Royal Belfast Academical Institution, and, in a speech of 1883, said he spoke as an Irishman on the Irish Question. H. J. S. Smith (1826–1883), best known as a number theorist and as Savilian Professor of Mathematics at Oxford, was born in Dublin. Osborne Reynolds (1842–1912), whose work on turbulent flow includes the Reynolds number, was born in Belfast. Francis Ysidro Edgeworth (1845–1926), the statistician, was born to a prominent family in Edgeworthstown, County Longford; his aunt was the famous Irish novelist Maria Edgeworth. He went to Trinity College, Dublin, before entering Oxford. George Francis Fitzgerald (1851–1901), a theoretical physicist whose name is immortalized in the Lorenz-Fitzgerald contraction, was tutored as a youth by George Boole's sister, graduated from Trinity College, Dublin, and then was Erasmus Smith Professor there. E. T. Whittaker (1873–1956), perhaps best known for the book in analysis published in collaboration with his student G. N. Watson (often called Whittaker and Watson), taught for about six years at the University of Dublin; one of his students there was Eamon de Valera, who continued to be advised by Whittaker in developing the School of Theoretical Physics in Dublin.

W. S. Gosset (1876–1937), best known as the Student of Student's t-test, developed that test while working for Guinness Breweries in Dublin. The Society of Actuaries in Ireland has a 't' in its crest in recognition both of the importance of this test in actuarial science and of its Irish significance. Walter Heitler (1904–1981), best known for his contributions to the Heitler-London theory of the covalent chemical bond and to quantum electrodynamics, was of Jewish origin and therefore had to flee from Nazi Germany; he found refuge from 1941 to 1949 at the Dublin Institute for Advanced Studies and became an Irish citizen. David Robert Bates (1916–1994) was born in Omagh, studied at the Queens University of Belfast and later built up an internationally-renowned school in theoretical physics there. He was also a founding member of the Alliance Party and supported the APNI's non-sectarian policies,

abhorring violence. Andrew Young (1919–1992), a numerical analyst of English origin, spent the last third of his life in Ireland, being the first Professor of Mathematics at the New University of Ulster in Coleraine until it merged with Ulster Polytechnic. Patrick Brendan Kennedy (1929– 1966), perhaps best known for his role in Hayman and Kennedy’s Subharmonic Functions, was Professor of Mathematics at University College, Cork, from 1956 to 1963.

Historians of mathematics will find that the scholarship in this work ranges from highly informed to anecdotal to closely following secondary sources. There are a few oversimplifications or minor errors. Some chapters explain the subjects mathematical work in detail with footnotes, while others treat it only briefly. Thus this book is not the place to go for a systematic introduction to its subjects or for in-depth biography, although lists of sources follow about half of the chapters. Nonetheless, this is a worthwhile volume. Taken together, the biographies give a good feeling for the development and influence of the mathematical community in Ireland, help identify Ireland’s role in the careers of some major figures in mathematics and physics, and give a good first introduction.’

3 1652-2014: Ireland, Trinity and mathematics – the book by David Attis

‘Dr. William Petty arrived at the port of Waterford on September 11, 1652.’
(‘A27’: Attis, 2014, p. 27)

‘This is the country of Hamilton, a country of great mathematicians.’
(Eamon de Valera, President of Ireland, Dail, 1939; A345-356)

‘Perhaps for the first time in Irish history mathematicians can be the heroes.’
(A26)

Trinity College is the focus of David Attis’ book, *Mathematics and the Making of Modern Ireland. Trinity College Dublin from Cromwell to the Celtic Tiger*. Attis starts his book by saying that ‘in each period of Irish history, mathematical equations represented not only solutions to technical problems, they also represented a vision of what Ireland could be and should be’ (A8). He ends his book with the following: ‘asking what kind of science we want to promote cannot be separate from the question of what kind of society we want to live in’ (A409).

Attis, David (2014) *Mathematics and the Making of Modern Ireland*. Docent Press.

The following is a summary of the book, itself a condensation of Attis’ own summary (A14-26):

The prelude to the book is entitled *Telling Stories About Mathematics*. (A5-14).

Chapter 1 is entitled *The Mathematics of Conquest*. Attis contrasts two stories about the fifteenth and sixteenth centuries: the scientific story of progress and enlightenment; and the Irish story of sectarian hatred and unabashed colonialism. He then notes that these two stories intersect: science was a source of power and in particular was used in the Cromwell’s conquest of Ireland through its role in navigation, surveying and military engineering. A key figure was William Petty, the

Royal Society, Cromwell's army, Oxford professor, proto political economist, organizer of the Downs Survey and one of Ireland's wealthiest planters. Trinity College Dublin had been founded in 1592 and 'was set up in part to consolidate the rule of the [Tudor monarchy](#) in Ireland, and it was seen as the university of the [Protestant Ascendancy](#) for much of its history'. (A14-15).

https://en.wikipedia.org/wiki/Trinity_College,_Dublin

'The **Irish Confederate Wars**, also called the **Eleven Years' War** (derived from the [Irish language](#) name *Cogadh na hAon Bhliana Déag*), took place in [Ireland](#) between 1641 and 1653. It was the Irish theatre of the [Wars of the Three Kingdoms](#) – a series of civil wars in the kingdoms of Ireland, England and Scotland (all ruled by [Charles I](#)). The conflict in Ireland essentially started by pitting the native Irish [Catholics](#) against [English](#) and [Scottish Protestant](#) colonists and their supporters, and ended with Royalists, Irish Catholics and Scottish Presbyterians fighting the ultimate winners, the English Parliament. It was both a religious and an ethnic conflict – fought over who would govern Ireland, whether it would be governed from England, which ethnic and religious group would own most of the land, and which religion would predominate in the country. It was the most destructive conflict in Irish history.'

https://en.wikipedia.org/wiki/Irish_Confederate_Wars

https://en.wikipedia.org/wiki/Wars_of_the_Three_Kingdoms

Chapter 2 is entitled *Newtonianism and Natural Theology*. The civil war and the Glorious Revolution had disrupted society and challenged the old ideas of Aristotelian philosophy, the established church and the divine right of kings. In pursuit of rigorous knowledge the elite debated natural philosophy and mathematics as well as theology, politics and religion. Toland argued that reason challenged politics and religion. Berkeley challenged, and Swift satirized, science. (A15-16).

Chapter 3 is entitled *Enlightenment and Revolution*. 'The 1780s witnessed the social, political and economic resurgence of Dublin' – the second city of the British Empire. Although Trinity remained essentially an ecclesiastical institution, there was a strengthening of science. Newtonian natural philosophy was seen as being in harmony with Anglican theology. The new sophisticated French calculus was introduced. Inspired by the French Revolution, there was rebellion in 1798. Science had not led to industrial and cultural revival and there was renewed sectarianism. (A16-17).

https://en.wikipedia.org/wiki/Irish_Rebellion_of_1798

Chapter 4 is entitled *Examining the Ascendancy*. By the 1801 Act of Union control of Ireland switched from an Irish parliament to the British parliament. The [Anglican] Church of Ireland and Trinity College Dublin were 'the most egregious examples of minority privilege'. Demand for reform led to new secular universities such as the University of London and the Trinity curriculum changed. Mathematics was promoted as the foundation of a liberal education, demonstrating the intellectual superiority of the Protestant elite. (A17-19).

Chapter 5 is entitled *Truth and Beauty*. The first major triumph of Trinity mathematics was the discovery of conical refraction in 1832. William Rowan Hamilton deduced from theory that this phenomenon should occur and subsequent experiment found that it did occur. In this instance theory and deduction had preceded empirical investigation. This stood in contrast to a process where empirical investigation is the first step from which hypotheses are derived by a process of induction. There is debate as to which of these two processes occurs in reality and

which is best. Hamilton's discovery related to the specific conflict between the particle theory and the wave theory of light. There were also conflicts between Anglican and non-Anglican and between universities and those outside universities. These various conflicts were correlated [unnecessarily?]. Hamilton and Wordsworth discussed the spiritual experience of beauty in science and poetry. The harmony of the mental and physical worlds proved that there was a creator. (A19-20).

Chapter 6 is entitled *Imagining Quaternions*. Hamilton is concerned that analytical mathematics should be as rigorously true and meaningful as Euclidean Geometry. Quaternions formed a link between geometry and analysis. An alternative view developed of algebra as the study of any self-consistent system of arbitrary rules. George Boole developed the first mathematical system of logic. His motivation was to help resolve the religious disputes that divided Ireland. (A20-21).

Chapter 7 covers the nineteenth century and into the twentieth and is entitled *Engineering the Empire*. New western technologies spread throughout the western empires and beyond: rail, road, telegraph ... electricity, telephone, radio, automobiles, television, aircraft. There is a distinction between mathematics, physics, experiment, university engineering and field engineering. In the 1840s, Trinity opened one of the first engineering schools in the British Isles. However applications were developed by people other than academic scientists (for example Marconi's development of radio). 'In Ireland ... science failed to lead to industry, and technical education had little effect on the Irish economy' (A21-23).

Chapter 8 covers the first half of the twentieth century and is entitled *Two Revolutions*. There is a revolution in physics with the development of relativity and quantum mechanics; and there is a political revolution with Ireland gaining independence. And there is a failure of Ireland to join in the 'technology-fuelled post-war economic boom'. There is a distinction here between old physics, new physics and technology; between the old economy and the new economy; and between pre-independence and post-independence political, cultural and academic power. The new University College Dublin and other institutions challenged the dominance of Trinity College Dublin. De Valera's Dublin Institute for Advanced Studies and the appointment of Schrodinger as the first director raised Ireland's standing in the new physics but 'science in Ireland remained pure and elitist and failed to deliver technological and economic benefits' (A25). (A23-25, 307-362).

Chapter 9 covers the 1990s to the 2010s and is entitled *The Knowledge Economy*. Information technology transforms world society, its economy and its science. Ireland and Ireland's universities prosper. 'The Irish were among the most aggressive (and successful) at capitalizing on the global mobility of information, capital and goods beginning in the 1980s and 1990s ... the Celtic Tiger ... Ireland went from the poorest country in Europe to one of the richest in less than a decade.' Science and mathematics are crucial for the information economy and are engines for economic growth. 'The traditional roles of the mathematician as the keeper of truth, the creator of beauty, the defender of the faith, and the shaper of minds have receded' (A25-26). (A363-409).

4 Guinness in Dublin and Gosset's t-test in statistics ... a link with UCL and Cedric Smith

Perhaps the most common test in statistical research is Student's t-test. This test was developed at the Guinness brewery in Dublin by W. S. Gosset using the pen name 'Student'. The Wikipedia entry for Gosset is given below. Note that he spent some time in Galton's Biometrical Laboratory at UCL. Some decades later Lionel Penrose occupied the Galton chair and Cedric Smith (a key figure in the Conflict Research Society) occupied the Weldon chair at the Galton Laboratory at UCL (see the 2014 Yearbook: Burt, 2016, pp. 4-5).

[I believe that the t-test in particular and the statistics of group differences in general could ameliorate conflict in that groups sometimes exaggerate their differences (see the 2014 Yearbook: Burt, 2016, Chapters on Ukraine, Scotland and gender and pp. 232-233, 290-294).]

<http://www.cambridgescholars.com/values-world-society-and-modelling-yearbook-2014>

'William Sealy Gosset (13 June 1876 – 16 October 1937) was an English statistician. He published under the pen name Student, and developed the [Student's t-distribution](#). *Life and career* [[edit](#)]

Born in [Canterbury](#), England to Agnes Sealy Vidal and Colonel Frederic Gosset, Gosset attended [Winchester College](#) before reading [chemistry](#) and mathematics at [New College, Oxford](#). Upon graduating in 1899, he joined the brewery of [Arthur Guinness & Son](#) in [Dublin](#), Ireland.^[1]

As an employee of [Guinness](#), a progressive agro-chemical business, Gosset applied his statistical knowledge – both in the brewery and on the farm – to the selection of the best [yielding](#) varieties of [barley](#). Gosset acquired that knowledge by study, by trial and error, and by spending two terms in 1906–1907 in the biometrical laboratory of [Karl Pearson](#). Gosset and Pearson had a good relationship. Pearson helped Gosset with the mathematics of his papers, including the 1908 papers, but had little appreciation of their importance. The papers addressed the brewer's concern with small samples; biometricians like Pearson, on the other hand, typically had hundreds of observations and saw no urgency in developing small-sample methods.^[1]

Another researcher at Guinness had previously published a paper containing trade secrets of the Guinness brewery. To prevent further disclosure of confidential information, Guinness prohibited its employees from publishing any papers regardless of the contained information. However, after pleading with the brewery and explaining that his mathematical and philosophical conclusions were of no possible practical use to competing brewers, he was allowed to publish them, but under a pseudonym ("Student"), to avoid difficulties with the rest of the staff.^[2] Thus his most noteworthy achievement is now called Student's, rather than Gosset's, [t-distribution](#).^[1]

Gosset had almost all his papers including *The probable error of a mean* published in Pearson's journal [Biometrika](#) under the pseudonym *Student*.^[3] It was, however, not Pearson but [Ronald A. Fisher](#) who appreciated the importance of Gosset's small-sample work, after Gosset had written to him to say *I am sending you a copy of Student's Tables as you are the only man that's ever likely to use them!*. Fisher believed that Gosset had effected a "logical revolution". Fisher introduced a new form

of Student's statistic, denoted t , in terms of which Gosset's statistic

was $z = \frac{t}{\sqrt{n-1}}$. The t -form was adopted because it fit in with Fisher's theory of degrees of freedom. Fisher was also responsible for applications of the t -distribution to regression analysis.

Although introduced by others, Studentized residuals are named in Student's honour because, like the problem that led to Student's t -distribution, the idea of adjusting for estimated standard deviations is central to that concept.

Gosset's interest in the cultivation of barley led him to speculate that the design of experiments should aim not only at improving the average yield but also at breeding varieties whose yield was insensitive to variation in soil and climate, i.e. robust. This principle only appeared in the later thought of Ronald Fisher, and then in the work of Genichi Taguchi during the 1950s.

In 1935, Gosset left Dublin to take up the position of Head Brewer, in charge of the scientific side of production, at a new Guinness brewery at Park Royal in northwestern London. He died two years later in Beaconsfield, England, of a heart attack.

Gosset was a friend of both Pearson and Fisher, a noteworthy achievement, for each had a massive ego and a loathing for the other.^[4] He was a modest man who once cut short an admirer with the comment that "Fisher would have discovered it all anyway."

https://en.wikipedia.org/wiki/William_Sealy_Gosset

5 My previous writings on Ireland

5.1 Nigeria, Ireland and Greece: geographical space and one-dimensional political space

Chapter 10 of the 2015 Yearbook (Burt, forthcoming):

Issue 16; pp. 4, 8-17

<https://docs.google.com/viewer?a=v&pid=sites&srcid=ZGVmYXVsdGRvbWFpbmxb3Jkb25idXJ0bWF0aHNvY3NjaXxneDoyMmRiMDFiZWZjZWVknGE4>

Issue 18; pp. 10-21

<https://docs.google.com/viewer?a=v&pid=sites&srcid=ZGVmYXVsdGRvbWFpbmxb3Jkb25idXJ0bWF0aHNvY3NjaXxneDoyZjI4N2U4OTk4NWlzMzk0>

Issue 19; pp. 6-13

<https://docs.google.com/viewer?a=v&pid=sites&srcid=ZGVmYXVsdGRvbWFpbmxb3Jkb25idXJ0bWF0aHNvY3NjaXxneDoyZmE4MjYxMTdjMWEyNzk2>

This chapter is about the relationship between political space and geographical space. The political space considered here is only one-dimensional because it is based on the percentage vote in cases where there are just two options. Three cases are considered: the presidential election in Nigeria; the same-sex referendum in Ireland; and the bailout referendum in Greece.

The first case is Nigeria – see background in Chapter 6. Presidential elections were held in Nigeria in March 2015. Muhammadu Buhari gained 54% of the votes and

sitting president Goodluck Johnson gained 45% - a sizeable win for Buhari. Variation in voting percentages across the 37 states revealed a highly divided society ranging between 1% and 95%. The distribution was fairly flat, with some central clustering and some polarisation. Despite this, variation within states was much greater than variation between states – as indicated by predictability and multi-level analyses.

Political space relates to geographical space. This can be studied in various ways. Looking at the 50% ‘winning contour partition’, Buhari won in a single set of connected states and Johnson won in three connected sets of states: the mid-south the east-middle and the Federal capital. Contour-partitions at different levels divided the area into four: north, upper middle, lower middle, and mid-south, ordered according to decreasing Buhari vote. Latitude north correlates 0.9 with the Buhari vote. The voting surface can be represented by a series of west-east sections for different latitudes north and this suggests an interaction between latitude north and longitude east and also a special mid-south effect. The pattern of results is also illustrated by looking at the spatial network of states and the correlated profiles for the primary and secondary concentric perimeters.

The second case is Ireland – see background in Chapter 5. On 22 May 2015 a referendum was held in Ireland to mandate provision for same-sex marriage. The bill was supported by all political parties but officially opposed by the Roman Catholic Church, in Ireland and in the Vatican (85% of the population in Ireland is Catholic). The bill’s approval, ‘Yes’, was seen by some as heralding a ‘kinder, gentler, more accepting’ society, by others as ‘a defeat for humanity’. The 62% ‘Yes’ vote (less than opinion polls had predicted) was, as well as being a sizeable win, also reflective of a divided society. Voting across the 43 constituencies exhibited a uniform distribution with the ‘Yes’ vote ranging from 75% (Dublin South East) to 49% (Roscommon Leitrim). So variation within constituencies was much greater than variation between constituencies. Political space relates to demographics: the ‘Yes’ vote correlated 0.9 with the logarithm of population density, with the area of the constituency and with the ‘internal distance’. Political space relates to geographical space, in particular to an urban-rural divide. The highest ‘Yes’ vote was in the capital, Dublin, in the East; next were ‘medium urban’ areas, the east & south coastal corridor and the two urban areas in the west, Limerick and Galway; and finally rural and lesser urban areas, the south being higher than the north. An equation seeks to capture east-west and south-north gradients as well as urban peaks. Ireland has a lower urban population (63%) than the UK (83%) and just nine urban areas with more than 30,000 people (following a power distribution). These areas and their internal transport linkages are mostly situated on the east & south coastal corridor, and are the primary terminals for transport to the UK and the rest of Europe. Turnout was positively related to the ‘Yes’ vote; and (hence?) to demographics.

The third case is Greece – see background in Chapter 6. Three elections were held in Greece in 2015: a legislative election on 25 January and a second legislative election on 20 September – but it is the bailout referendum, held on 5 July between these two other elections, that we focus on here. In terms of differences between states the results of the three elections correlated 0.7 with one another. The bailout proposal was rejected with 61% voting ‘No’ and 39% voting ‘Yes’ - a sizeable win for ‘No’. Variation in voting percentages across the 57 regions revealed a moderately divided

society – ranging between 51% and 74%. Political space relates to geographical space. Perimeter profiles exhibited local jaggedness superposed on single-peakedness.

The chapter ends with a comparison of seven binary-option elections: USA 2008 and 2012; Ukraine 2014; Scotland 2014; Nigeria 2015; Ireland 2015; and Greece 2015. The type of analysis of political and geographical space used in this chapter is further discussed in Chapter 14. The 2014 Yearbook discusses the political and geographical space associated with Ukraine (Chapter 9) and Scotland (Chapter 10).

5.2 Northern Ireland: multidimensional political space and geography

Chapter 11 of the 2015 Yearbook (Burt, forthcoming):

Issue 17B; pp. 5-25

<https://docs.google.com/viewer?a=v&pid=sites&srcid=ZGVmYXVsdGRvbWFpbmxb3Jkb25idXJ0bWF0aHNvY3NjaXxneDo3ZTg4Y2JkNTNiYjAwMTc>

Issue 18; pp. 21-23

<https://docs.google.com/viewer?a=v&pid=sites&srcid=ZGVmYXVsdGRvbWFpbmxb3Jkb25idXJ0bWF0aHNvY3NjaXxneDoyZjI4N2U4OTk4NWlzMzk0>

This chapter, like the previous one, is about the relationship between political space and geographical space. Unlike the previous chapter, the political space considered here is multi-dimensional because it is based on the percentage votes in a case where there are many options. Also, in this chapter it is the political space that receives most attention with only a brief consideration of the geographical aspect.

The chapter is about the Northern Ireland election of 2015 (whereas the following Chapter 11 is about the UK as a whole). Voters can choose between many parties. So the voting percentages can be represented by a point in multidimensional political space. The overall result is a point in political space; each constituency result is a point in political space; and the set of constituency results can be represented as a set of points in political space. The space is a percentage space and so is finite with a well-defined centre. What is the shape of the set of points in relation to the centre?

Overall, there are a few large parties and many small parties and so the ‘overall point’ is quite far from the centre of the space. Moreover many of the individual constituency results show dominance by a single party – and so the constituency points are quite far from the overall point. Different parties have dominance in different constituencies (‘multidimensional polarisation’) and so the constituency points are quite far from one another - in different directions from the overall point.

Larger parties overall vary more across constituencies than do smaller parties, and this is reflected in differential variation in different dimensions. A principle component analysis identifies the principle dimensions of variation. The first component concerns the primary competition between the two largest parties: Sinn Fein against the Democratic Unionists. It explains 30% of the total variance. The thirteen parties can be ordered along this primary continuum with Sinn Fein at one extreme and the Democratic Unionists (and the smaller Alliance and Conservatives) at the other. The eighteen constituencies can also be ordered along this primary continuum with Belfast and Newry & Armagh (where Sinn Fein is strong) at one extreme and Belfast East and North Down (where Democratic Unionists, Alliance and Conservatives are strong) at the other. This is referred to below as the S score (Sinn Fein high). Other

components concern the competition between the other parties – the second component explains just 15% of the variation and the remaining components explain less than that. Restricting attention to the subspace containing the largest five parties, another analysis finds the same first component as before, and a second component being Ulster Unionists versus Social Democratic and Labour.

Prompted by the notion that individuals have single-peaked preferences in option space, the notion that parties have single-peaked preferences in percentage space is considered. On a one-dimensional continuum, parties tend to peak to the left or to the right. In a two-dimensional space, constituencies are located on a closed loop and parties peak at the point on the loop nearest the party vertex, giving an approximately sinusoidal curve.

Political space relates to geographical space. There is a gradient of increasing S score running from North-East to South-West – with contours of equal S-score at right angles to the gradient. The capital, Belfast, is in the North-East; and East-West Belfast reflects the gradient. The borders also reflect the gradient, the North-East looking to Scotland and the UK and the South-West adjoining Ireland – Ulster Unionists look to the UK and Sinn Fein looks to Ireland.

5.3 Ireland 1801-1916-2016: independence continuum, political configurations, correlated party trajectories, principle component analysis

Issue 27 of the Commentary (March 2016):

<https://docs.google.com/viewer?a=v&pid=sites&srcid=ZGVmYXVsdGRvbWFpbxnb3Jkb25idXJ0bWF0aHNvY3NjaXxneDozNGM5NGQ2OThkYWZkN2Vl>

Ireland's politics in the period 1801 to 2016 has exhibited the rise and fall of political configurations located on an independence continuum; correlated party trajectories are identified using principle component analysis, and exhibit long-term patterns, volatile transitions and short-term fluctuations.

Overview

- 1 Easter Rising, 1916 ... New IRA, 2016... five points on the independence continuum
 - 2 Ireland's general election, 2016 ... possible coalitions ... the latest proposal
 - 3 A brief history of Ireland ... political configurations 1801-1918
 - 4 Ireland cabinets, 1919-2016 ... the increasing prevalence of coalitions
 - 5 Ireland elections, 1922-2016
 - 5.1 The parties' shares of the seats
 - 5.2 Correlated party trajectories ... a principle component analysis
 - 5.3 The size of the electorate and the number of seats
 - 5.4 Size of electorate, number of parties, turnout, size of largest party and coalitions
 - 5.5 Turnout and the parties' shares of the votes – a model
 - 6 Dynamic ideas of the 1960s and 1970s ... Asa Briggs (1921-2016) interdisciplinarity ... Chris Zeeman (1925-2016) system, catastrophe theory, game theory ... Michael Nicholson (1933-2001) and CRS (1963-)
 - 7 *Conflict Research Society* conference, Trinity College Dublin, 7-9 September 2016
 - 8 Invitation: panel on Values, World Society and Modelling
- References (by section)

Overview.

Easter 1916, the recent election and the New IRA have prompted this investigation of Ireland's electoral history, 1801 to 2016. The election in February 2016 partially reversed the dramatic swings of the 2011 election and also saw the rise of Sinn Fein – and presented a problem in coalition formation. In the nineteenth century the electoral dominance of the two British parties, Tories and Whigs, gave way to the dominance of the Home Rule party; the First World War, the postponement of Home Rule and the Easter Rising in 1916 and its suppression were the prelude to Sinn Fein's dominance in the 1918 election – with a Unionist presence in the North. The 1922 election in the South split pro-Treaty Sinn Fein and anti-Treaty Sinn Fein. By 1937, this split had transformed into two parties, Fine Gael (FG) and Fianna Fáil (FF) which have continued to dominate Ireland's elections ever since.

The focus here is on a statistical analysis of governments and election results in the period 1919-2016. The start of the period exhibited transition volatility in terms of the identity of the major parties. Single-party majority governments with consecutive wins at the start have given way to coalition minority governments often with a single term of office. The average over the period has given FF 44% of the seats, FG 33%, Labour 11% and Independents 5%.

The trajectories of parties' shares of seats are correlated and a principal component analysis finds five components: (C1) 'FF versus Indep, SF and Other', 38% of the variation; (C2) 'FG and Labour versus the rest', 28%; (C3) 'Labour versus FG and Independent', 15%; (C4) 'Independent and Labour versus Sinn Fein', 10%; and (C5) 'Sinn Fein versus Other', 9%. Parties and elections are located in C1-C2 space. Rotating the axes gives U1-U2 space with short-term fluctuations in the U1 direction and long-term change in the U2 direction.

The size of the electorate correlates with the number of parties contesting the election; the number of parties correlates negatively with the turnout; the number of parties correlates negatively with the percentage vote for the largest party (and negatively with the seat share for the dominant party FF); and the percentage vote for the largest party is negatively associated with the presence of a coalition. Also party percentages are related to turnout. The size of the electorate has doubled in the second half of the period – with roughly corresponding changes in the other variables.

5.4 Dublin and Einstein

Issue 26 of the Commentary (February 2016) contained the following:

<https://docs.google.com/viewer?a=v&pid=sites&srcid=ZGVmYXVsdGRvbWFpbmxb3Jkb25idXJ0bWF0aHNvY3NjaXxneDplYmJmZDNkOGUwZGE1NzQ>

- 3.1 Gravitational waves detected 100 years after Einstein's prediction
- 3.2 Have you ever jumped onto a moving bus? ... relative motion
- 3.3 Dublin's Brougham Bridge and Hamilton's quaternions
- 3.4 Hamiltonians: from Trinity Cambridge to Trinity Dublin
- 3.5 Einstein uses the Hamiltonian
- 3.6 'Ireland's mathematical achievements and the central role played by Trinity College Dublin.'

6 Ireland's hung parliament ... Liffey bridge ... Peter Emerson, de Borda Institute

Dublin has been the location of a number of practical examples of the voting procedures advocated by Peter Emerson at the de Borda Institute. Two of these are given below.

<http://www.deborda.org/home/2016/4/25/ireland-let-the-dail-elect-a-government.html>

<http://www.deborda.org/dublin-city-council/>

<http://www.deborda.org/>

Ireland's hung parliament

6th May 2016

Enda Kenny was re-elected as Taoiseach (Irish prime minister) 70 days after a general election which had produced no outright winner.

<http://www.bbc.co.uk/news/world-europe-36228773>

24th April 2016

Mock Dáil produces a government of national unity - and it only took 90 minutes Joe Humphreys. *The Irish Times*.

'The outcome of the *Irish Times*/DCU/deBorda/CiviQ matrix vote experiment on 23rd April, could hardly have been better: the result was proportional, most of the ministers were appointed to departments for which they were appropriate and, if it had been for real, it would have been the most gender-balanced Dáil ever!'

<http://www.deborda.org/home/2016/4/25/ireland-let-the-dail-elect-a-government.html>

'It is chaotic and unreal but there's a serious objective, as Peter Emerson, director of the Belfast-based de Borda Institute explains: "We have this fixation with majority voting. But majority voting is the most inaccurate measure of collective opinion ever invented".'

Emerson has run similar voting simulations in the Balkans, China, the developing world and Northern Ireland, trialing a powersharing exercise in Belfast all of 30 years ago. He points out that elections in Europe tend to produce coalitions where the "tail wags the dog", namely a smaller party has disproportionate influence.

Powersharing avoids this risk and is also more representative - on paper at least. But would it work in practice?

In a panel discussion afterwards, there was some scepticism expressed. Could voters stomach the idea of certain parties in government? And would a powersharing government take collective responsibility, or leave certain ministers hang out to dry?'

<http://www.irishtimes.com/news/politics/mock-d%C3%A1il-produces-a-government-of-national-unity-and-it-only-took-90-minutes-1.2622796>

3rd March 2016

Humphreys, Joe. (2016) Democracy 2.0: five steps to give power back to the people. *The Irish Times*. March 3.

26th February 2016

Irish general election

'From Majority Rule to Inclusive Politics: Electing a Power-Sharing Coalition, (2016), with a foreword by Professor Iain McLean. Majority rule is fine, in so far as it goes. But majority rule by majority vote is not so good. If there is a better way of identifying the will of the majority, or even the collective will, and if that way is not majoritarian, then there is little or no justification for (single party or coalition) majority rule. So parliaments should represent all the people, and every government should represent the entire parliament, as in Switzerland: a proportional, all-party, coalition Federal Council or Government of National Unity.'

<http://www.deborda.org/publications/>

The new bridge over the Liffey

Dublin City Council's Rosie Hackett Bridge: A Landmark in Decision-Making
John Baker, Emeritus Professor, School of Social Justice, University College Dublin.
'On 2 September, 2013, Dublin City Council voted to name the newest bridge over the River Liffey the Rosie Hackett Bridge. What makes this a landmark decision is that it seems to have been the first authoritative decision taken by a public body in Ireland – and perhaps even in Europe – to have used the voting procedure known as the Borda Count, referred to in the Council's proceedings as a Referendum (Dublin City Council 2013a, item 24). This report summarises the process, analyses the results, and discusses some of the technical issues that arise with this method of voting. It concludes that the procedure was well suited to the task in hand.'

<http://static1.1.sqspcdn.com/static/f/220414/24541246/1429003665077/Report+on+Rosie+Hackett+decision-final2.pdf?token=CvMYOzX%2BjG5Hvi9krFBrl0Bjlo4%3D>

'Dublin City Council invited nominations from the public for the bridge's final name. Ten nominations were referred to the council's naming committee, which used a [Borda count](#) to shortlist five names for a plenary meeting of the council, where another Borda count on 2 September 2013 chose to name it after [Rosie Hackett](#), a trade unionist and republican revolutionary.^{[13][14]} Hackett had been nominated by three women members of [Labour Youth](#).^[13] The other four shortlisted were [Willie Bermingham](#), [Frank Duff](#), [Kathleen Mills](#), and [Bram Stoker](#).^[8] The de Borda institute asserted that the name selection process was the first time an Irish elected chamber used a non-[majoritarian](#) decision-making methodology.^[14] Some media reports characterised it as the first Liffey bridge named after a woman,^{[15][16][17]} though other bridges formerly were.'^[fn 1]

https://en.wikipedia.org/wiki/Rosie_Hackett_Bridge

My own interest in the Rosie Hackett Bridge case study is in the voting space exhibited by the votes and I was able to investigate this thanks to Peter Emerson sharing the data with me. The sections of my paper are indicated in Table 1 below.

<https://docs.google.com/viewer?a=v&pid=sites&srcid=ZGVmYXVsdGRvbWFpbmxb3Jkb25idXJ0bWF0aHNvY3NjaXxneDo0YTtk2N2MOODRIYzQ3ZjNi>

Table 1 Single-peaked preferences? Voting for the name of the bridge over the Liffey

Dublin City Council use the Borda Count to name a new bridge over the Liffey

The five options for the naming of the bridge

The political parties on Dublin City Council

The key finding

The voting

The analysis by the *de Borda Institute*

Understanding the results: statistics, psychometrics, social choice and political science

The frequency distribution of rankings

Mean, median and mode

Standard deviation

The cumulative frequency distribution

Matched comparisons

The correlation matrix

Dimensions in space

Single-peaked preferences

The voting space and the political party space

The option which would have reconciled and the criterion which would have made it the winner

What can be claimed for the Borda Count

7 Other items in the news

The Scottish Parliamentary elections on 5th May 2016 saw a consolidation of the power of the SNP and the continued decline of Labour with Conservatives moving into second place.

Background on the situation is provided by Chapter 10 of the 2014 Yearbook:

10 Scotland: 'Our Values'? Independence? More Varied and Less Distinctive

<http://www.cambridgescholars.com/values-world-society-and-modelling-yearbook-2014>

Elections on 5th May 2016 elsewhere in the UK saw the election of a Muslim Mayor of London, and a pattern of votes in England and Wales not dissimilar from the 2015 general election.

Background on the situation is provided by Chapters 12 to 14 of the 2015 Yearbook (Burt, forthcoming):

12 The UK general election 2015: prelude, results and aftermath

Issue 17A; pp. 2-19

<https://docs.google.com/viewer?a=v&pid=sites&srcid=ZGVmYXVsdGRvbWFpbmxb3Jkb25idXJ0bWF0aHNvY3NjaXxneDo3OGZjNmI3Yzc5MDhmZmQz>

Issue 17B; pp. 1-5

<https://docs.google.com/viewer?a=v&pid=sites&srcid=ZGVmYXVsdGRvbWFpbmxb3Jkb25idXJ0bWF0aHNvY3NjaXxneDo3ZTg4Y2JkNTNiYjAwMTc>

13 UK general elections: the change from 2010 to 2015; a time series analysis of 1945 to 2015

Issue 23; pp. 12-26 -34

<https://docs.google.com/viewer?a=v&pid=sites&srcid=ZGVmYXVsdGRvbWFpbmxb3Jkb25idXJ0bWF0aHNvY3NjaXxneDo0MTBiZGFjNDVmYzNiYTNm>

14 Jeremy Corbyn: probability; political values, preferences and utilities

Issue 20; pp 1-18

<https://docs.google.com/viewer?a=v&pid=sites&srcid=ZGVmYXVsdGRvbWFpbmxb3Jkb25idXJ0bWF0aHNvY3NjaXxneDo3YzAwYWU4ZjhjYjZlNWJh>

Athens was convulsed by violence last night [9th May 2016], with tens of thousands of protesters laying siege to the Greek parliament as its leftist government tried to force new austerity measures into law to placate international creditors. See Table 2.

Carassava, Anthee and Bruno Waterfield (2016) Tsipras under siege after climbdown on austerity. *The Times*, 9 May. Pp. 28-29

[Leader] (2016) Debt trap. Europe's longterm economic recovery depends on helping to ease Greece's plight. *The Times*, 9 May. p. 27.

Waterfield, Bruno and Anthee Carassava (2016) Brexit threat looms over Greek bailout. *The Times*. 10 May. 36-37.

Background on the situation is provided by Chapter 10 of the 2015 Yearbook (Burt, forthcoming):

Issue 19; pp. 6-13

<https://docs.google.com/viewer?a=v&pid=sites&srcid=ZGVmYXVsdGRvbWFpbmxb3Jkb25idXJ0bWF0aHNvY3NjaXxneDoyZmE4MjYxMTdjMWEyNzk2>

‘Three elections were held in Greece in 2015: a legislative election on 25 January and a second legislative election on 20 September – but it is the bailout referendum, held on 5 July between these two other elections, that we focus on here. In terms of differences between states the results of the three elections correlated 0.7 with one another. The bailout proposal was rejected with 61% voting ‘No’ and 39% voting ‘Yes’ - a sizeable win for ‘No’. Variation in voting percentages across the 57 regions revealed a moderately divided society – ranging between 51% and 74%. Political space relates to geographical space. Perimeter profiles exhibited local jaggedness superposed on single-peakedness.’

Table 2 Economic statistics: Greece, Eurozone and UK compared

	unemployment %; youth unemployment; debt to GDP (2015); real GDP growth rate (2015)					
Greece	26.5	52.4		176.9		-0.2
Eurozone 11.6	23.8		90.8		1.6	
UK	6.1	16.9		89.2		2.3

Source: The Times, 9 May 2016. p. 28 (Eurostat)

In the period 2008-2017 Greek GDP growth rates were: -0.3, -4.3, -5.5, -9.1, -7.3, -3.2, +0.7, -0.2, -0.6 (predicted 2016) and 2.7 (predicted 2017). GDP per capita was \$32,000 in 2008 and \$19,000 in 2015. Net debt as % of GDP in the period 2008-2017 was 153, 172, 175, 194 (predicted 2015), 203 (predicted 2016) and 199 (predicted 2017). The Greek debt is owned by Eurozone governments (60%), IMF (10%), ECB (8%), private sector (17%) and Greek banks and others (5%). The Greek debt repayment schedule in 2016 has a sharp peak in July.

Waterfield, Bruno and Anthee Carassava (2016) Brexit threat looms over Greek bailout. *The Times*. 10 May. 36-37.

Boris Johnson: ‘It is the EU’s pretensions to run a foreign policy and a defence policy that risk undermining Nato. ... we’ve seen what happened in the Ukraine’ [9th May 2016]. The news headlines ran ‘Boris branded a Putin apologist’. A House of Lords report said that the EU was guilty of sleepwalking into the Ukraine crisis.

Fisher, Lucy (2016) Boris branded a Putin apologist as he blames Crimea crisis on the EU. *The Times*. May 10. Pp. 8-9; also 1, 27.

<http://www.parliament.uk/business/committees/committees-a-z/lords-select/eu---foreign-affairs-defence-and-development-policy-sub-committee-c/news/eu-russia-report-publication/>

Background on the situation is provided by Chapter 9 of the 2014 Yearbook:
9 Ukraine: United or Divided? West and East; Living with Others
<http://www.cambridgescholars.com/values-world-society-and-modelling-yearbook-2014>

8 CRS conference, Trinity College Dublin, 7-9 September 2016

Conference website: <http://conflictresearchsociety.org/ourevents/dublin-2016/>
submit a paper: <http://conflictresearchsociety.org/submit-a-paper/>
submit a panel: <http://conflictresearchsociety.org/submit-a-panel/>

The Conflict Research Society Annual Conference 2016
PEACE, CONFLICT AND COMMEMORATION
International Peace Studies, Irish School of Ecumenics, Trinity College Dublin
September 8-9 2016

We are writing to invite you to the Conflict Research Society's 2016 Conference, which will take place at Trinity College, Dublin on September 8-9 this year. The conference marks the centenary of the Easter Rising, the Battle of the Somme, and the birth of the peace researcher and practitioner Adam Curle. To mark these events we have chosen the theme 'Peace, Conflict and Commemoration'.

The CRS is an interdisciplinary association committed to a better understanding of conflict and cooperation, and ways to mitigate the destructive effects of violence. Our annual conference brings together about 100 peace and conflict researchers and practitioners and is an opportunity to present current research, hear keynotes from leading figures and learn about the newest developments in the field.

On behalf of the Conflict Research Society and the International Peace Studies programme at Trinity College Dublin, which is hosting the conference, we warmly invite you to participate. We welcome proposals, papers and panels relevant to the conference theme or to the broad field of peace and conflict research and practice. Please find below outline details of the conference programme and information about how to submit paper and panel proposals. Further updates will follow on the CRS conference web page.

Plenary events

The plenary sessions will include the following presentations:

Stathis Kalyvas, Arnold Wolfers Professor of Political Science & Director, Program on Order, Conflict and Violence, Yale University.

Irish Peace Process: Irish Department of Foreign Affairs, Glencree Centre for Peace and Reconciliation, and Corrymeela Community (further details to be announced)

Commemoration and Conflict (panel discussion or distinguished Irish speaker, tbc)
CRS Book Prize Winner (to be announced).

Papers and Panels

We welcome proposals for papers and panels. There are still places available at the conference, but please register soon to avoid disappointment. To submit a proposal for a paper or a panel or a poster please visit the CRS website:

<http://conflictresearchsociety.org/ourevents/dublin-2016/We>

We plan to close the call for papers at the end of May and cannot guarantee to accept late submissions.

Besides papers we are happy to accept proposals for posters and there will be a poster display in the foyer of the conference. We recognise that it may not be appropriate for practitioners to prepare full length papers and we are happy to accept presentations or other forms of submission for practitioners' panels.

Cedric Smith Prize Award:

We will announce the winner of the 2015 Cedric Smith Prize for the Best Student Work in Peace and Conflict Research at the conference. One of the sessions will include a presentation by the prize-winner. The judging panel this year will include Caroline Hartzell, editor of Conflict Management and Peace Science; Carl Death, co-editor of African Affairs; and Nicolas Lemay-Hébert co-editor of the Journal of Intervention and Statebuilding together with SudaPerrera of the CRS Council.

The CRS Book Prize Award

Every year the CRS makes this award to honour the best book in the field published in the last three years. Previous book prize winners have included Steven Pinker for *The Better Angels of Our Nature*, Kathleen Cunningham for *Inside the Politics of Self-Determination*, Joshua Goldstein for *Winning the War on War: The Decline of Armed Conflict Worldwide*, and Kevin Avruch for *Context and Pretext in Conflict Resolution*.

Wednesday 7 September

Arrival and CRS Council Meeting.

It is hoped there may be a public meeting with a Palestinian speaker on Wednesday evening, to be confirmed, and there may be a historical walking tour of Dublin if there is demand – details tbc.

Conference Dinner

The Conference Dinner will be on Thursday 8 September in the Trinity Dining Hall. Please register if you wish to attend on the conference website.

Publishers' stand

There will be stands for publishers who wish to exhibit books at the conference.

Dublin and Ireland

Besides the conference, Dublin has many attractions which include its pubs and music, its literary heritage, the Creative Quarter, Grafton Street, the Guinness Factory, the Irish Whiskey Museum, the Book of Kells, the Ha'penny Bridge over the Liffey, the Tall Ships and Famine Museum, the National Museum of Ireland and many more. Nearby you can stretch your legs and smell the peat fires in the Wicklow Mountains, visit the seashore at the Cliffs of Moher, or visit Blarney Castle and Cork.

Registration and costs:

Please go to the conference website to register: <http://conflictresearchsociety.org/ourevents/dublin-2016/> and to join the CRS and get discounts on conference fees visit <http://conflictresearchsociety.org/membership/>

The conference fees for 2016 are:

	Full	Concessions	Students
CRS members	£120/€ 150	£110/€ 140	£50/€65
Non-members	£150/€ 190	£110/€ 140	£65/€85

There is an additional charge of €30 for the conference dinner.

When you have submitted your paper proposal and have been registered, the conference website will show options for accommodation.

Accommodation

Accommodation is available at special rates in Trinity College Dublin and at the Trinity City Hotel, see the website for a link to book these.

For details of the Trinity College accommodation, see <http://www.tcd.ie/summeraccommodation/>. Single en suite rooms are €76/night and twin rooms are €124. A booking code for CRS will be provided when you have registered.

For the Trinity City Hotel, the special rate is €117 for Bed and Breakfast per person single occupancy. See: <http://www.trinitycityhotel.com/>. Again, a booking code for CRS will be provided when you have registered. Rates are subject to availability and blackout dates.

Other options where we have not negotiated special rates include:

1-Central Hotel Dublin: <http://www.centralhoteldublin.com/>

2-Davenport Hotel, Dublin: <http://www.davenporthotel.ie/>

3-Buswells Hotel, Dublin: <http://www.buswells.ie/>

The conference team

The academic host is Dr Iain Atack, International Peace Studies, Trinity College Dublin, [atacki@tcd.ie]. The Conference Organizer is Dr Yaser Alashqar ([alashqay@tcd.ie]) and the Conference Organizing Committee comprises Dr Iain Atack, Dr Carlo Aldrovandi, Dr Yaser Alashqar and Olivia Wilkinson. The programme chairs will be Iain Atack, Carlo Aldroyandi and Luke Abbs.

Useful links:

For general information about the Conflict Research Society, and information about the benefits of membership and how to join, please visit:

<http://www.conflictresearchsociety.org/>

For information about peace and conflict studies at the Irish School of Ecumenics/ Trinity College Dublin, please visit: <https://www.tcd.ie/ise/postgraduate/peace-studies.php>

For information about the Conflict Analysis Research Centre at Kent which hosts the CRS please see: <http://www.kent.ac.uk/politics/carc/>

We look forward to your proposals and registration.

PS Please feel free to circulate this message to others who may be interested in the conference and to PhD students.

Kind Regards,

Hugh Miall, Chair of the Conflict Research Society, University of Kent.
Iain Atack, International Peace Studies, Irish School of Ecumenics, Trinity College,
Dublin.