

Introduction

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The world will be a dull world some hundreds of years hence, when Fancy shall be dead, and ruthless Science (that has no more bowels than a steam-engine) has killed her.

William Makepeace Thackeray, 1843¹

Driving rain prevented William Thackeray from leaving his Galway hotel room, so he whiled away the hours by reading romantic tales and 'Hedge-School Literature'. Although he enjoyed this respite from the practical and improving fare of English penny magazines, he predicted a day when *all* literature would be practical and improving: imagination would fall away as science became the only occupation of mankind. That Galway bore few of the marks of scientific progress seems not to have affected Thackeray's certainty in the eventual triumph of 'ruthless science'. In his travels through Ireland he found other towns similarly lacking evidence of scientific development. Cork's scientific institution, for example, was one of many 'swaggering beginnings that could not be carried through; grand enterprises begun dashing, and ending in shabby compromises or downright ruin'.² To Thackeray, the appeal of Ireland in 1842 lay in its romantic landscapes and its quaint towns. Underdevelopment brought inconveniences to the traveller but was also further evidence that the country had not yet entirely succumbed to the empiricist and utilitarian spirit of the age.

Thackeray was neither the first nor the last to suggest that science and the arts, practicality and creativity, were in opposition. Likewise the notion of science as non-Irish has a long history and has prevailed until rather recently. Ireland's tourism industry reinforces the historical focus on creative and literary achievements rather than scientific ones. However, as the essays in this volume attest, science was an important element of nineteenth-century Irish life. Science never killed fancy in Ireland but should itself be seen as another form of creativity; it is a cultural phenomenon that can give us insights into the past.

The nineteenth century has dominated histories of science in Ireland and it may be fair to ask what another volume on the subject can add to our knowledge. Although the biographical details of Ireland's most famous scientific men (and some women) are now relatively well known, this book offers new insights into the participation of those beyond the intellectual elite. This book also serves to place Irish

¹ W.M. Thackeray, *The Irish sketch book* (Belfast, 1985, [1843]), p. 163. ² Thackeray, *The Irish sketch book*, p. 83.

perspectives on science into the historical study of Irish literature and culture, as well as the context of the well-developed historiography of Victorian science. Finally, this book continues the rich interdisciplinary tradition that has characterized the history of science in Ireland, offering perspectives from science, literature, history and archaeology.³

The essays in this book represent a diversity of topics and approaches, yet they cluster around three themes: innovations, individuals and institutions. These themes are significant strands in the current literature on the history of science in Ireland. Although the themes overlap, and many of the essays might have been included in more than one section, these divisions promote useful comparisons between the papers in each section. Innovations are at the heart of the history of science and this section examines the propagation and reception of particular scientific ideas. This process is dependent on the activities of the individuals who form the focus of the second section: not only scientific men but women, clergymen, writers, readers and the general public. Essays on individuals look at how specific people have engaged with science or scientific ideas. The final section on institutions encompasses broader scientific engagement on the scale of communities and the state. These essays deal with the ways in which individuals have banded together in order to promote scientific ideas, particularly in an educational context. Essays highlight how science was used to further political and social agendas in nineteenth-century Ireland.

INNOVATIONS

The modern-day significance of many innovations from the nineteenth century may be the reason why the period has attracted so much historical study. Nineteenth-century precursors of a sort can be found for many of the technologies we rely on and the scientific ideas we hold, although historians now eschew this approach to the history of science. The history of Victorian science is no longer dominated by the intellectual history of important discoveries.⁴ Cultural and social context now form an important part of any examination of a scientific innovation. The definition of a scientific innovation, for the purposes of historical investigation, has expanded to include unorthodox and even folk knowledge about the natural world.

Histories of nineteenth-century science now include knowledge systems formerly considered marginal or unscientific, such as phrenology and mesmerism.⁵ This change in subject matter has also signalled a change in approach to orthodox science. For example, the process by which Charles Darwin's theory of evolution by natural selection came to be accepted is now examined rather than assumed.

3 J.A. Bennett, 'Why the history of science matters in Ireland' in D. Attis and C. Mollan (eds), *Science and Irish Culture* (Dublin, 2005), pp 1–14. 4 B. Lightman, 'Introduction' in B. Lightman (ed.), *Victorian science in context* (Chicago, 1997), pp 1–14. 5 A. Winter, *Mesmerized: powers of mind in Victorian Britain* (Chicago, 1998); J. van Whye, *Phrenology and the origins of Victorian scientific naturalism* (Aldershot, 2004).

Competing ideas are given an equal share in the story. The instruments that men of science rely upon are now themselves interrogated alongside the knowledge they purport to produce. A broader definition of science and an emphasis on processes and artefacts means that studies of countries like Ireland, peripheral to the centre of the scientific world, need not be peripheral to the literature on the history of science. However, Irish scholars have been somewhat slower to embrace these subjects. For example, there is a single study of phrenology in Ireland.⁶ Essays in this volume begin to redress this balance while suggesting avenues of future research.

No single innovation in the scientific thought of the nineteenth century has been so widely researched as Darwinian evolution. Nevertheless, the literature on Darwinism in Ireland is relatively small.⁷ Thomas Duddy's essay contextualizes the cultural factors that affected acceptance, rejection and modification of Darwin's theory of evolution. By demonstrating that Ireland, like elsewhere, encompassed a variety of responses, Duddy dispels the notion that Irish people were simply divided between horrified creationists and hardened evolutionists. Duddy identifies four strands of thought, exemplified by individual writers, which display a spectrum of responses to Darwin's ideas. In this way, Duddy's essay reflects the aims of the volume as a whole and offers a more diverse reading of how science and technology were pursued, interpreted, disseminated and received in nineteenth-century Ireland.

Astronomy, like evolution and natural history, interested a broad section of Irish society beyond men of science. Nineteenth-century Ireland boasted a substantial scholarly community of astronomers as well as several significant female popularizers of astronomy.⁸ Ian Elliott's essay supplements existing literature by providing a history of telescope manufacture in a Dublin-based family business. Grubb's manufacturing firm in Ireland was a unique high-technology enterprise that constructed many of the world's largest and best telescopes as well as producing a wide range of precision optical and mechanical instruments. Elliott's history of the Grubbs pays particular attention to specific telescopes, such as the Great Vienna and Great Melbourne Telescopes. At the same time, Elliott demonstrates how technological development and science were affected by political and social changes towards the end of the nineteenth and start of the twentieth century. For example, the Grubbs gradually turned their attention to military and surveying instruments in response to the demands of imperialism and war.

Just as the Grubbs' instruments were used to survey sky and land, empirical

6 E. Leaney, 'Phrenology in nineteenth-century Ireland', *New Hibernia Review*, 10:3 (2006), 24–42. 7 A good example is D. Livingstone, 'Darwin in Belfast: the evolution debate' in J.W. Foster (ed.), *Nature in Ireland* (Dublin, 1997), pp 387–408; a more general introduction is provided in G. Jones, 'Darwinism in Ireland' in D. Attis and C. Mollan (eds), *Science and Irish culture* (Dublin, 2005), pp 115–38. 8 See, for example, N. Whyte, "'Lords of ether and of light": the Irish astronomical tradition of the nineteenth century', *Irish Review*, 17/18 (1995), 127–41. On the female popularizer Mary Agnes Clerke, see B. Lightman, 'The visual theology of Victorian popularizers of science: from reverent eye to chemical retina', *Isis*, 19:4 (2000), 651–80.

observation can itself become a form of surveillance. The technologically innovative surveys of the nineteenth century, including the geological and ordnance surveys, were tools of governance as much as they were scientific enterprises. They were aimed at harnessing science to the realization of Ireland's economic potential. Tadhg O'Keeffe and Patrick Ryan's essay makes use of the Ordnance Survey maps to reveal representations of the 'Monto', Dublin's notorious red-light district. As O'Keeffe and Ryan argue, maps are less conveyors of information about places than media through which places are created and recreated. Thus, their essay questions the degree to which scientific observation can be said to represent factual reality.

Elizabeth Neswald's essay on the cold water cure grapples with the line between accepted and discredited science. Neswald uses hydrotherapy in Cork as a case study to examine the networks of cultural, social and political ideas that impact upon the dissemination and reception of science. Rejected by the metropolitan medical elite, hydrotherapy's resistance to suppression in Cork demonstrates the value of local Irish case studies. Such studies demonstrate local variety, but also enrich our overall understanding of the power politics of science during the period.

INDIVIDUALS

The engagement of an individual with science has continued to prove a fruitful means of examining the history of science. Among the most recent and valuable examples is a two-volume biographical dictionary of Irish physical and chemical scientists.⁹ The *Dictionary of Irish Biography* also contains a generous complement of scientists. Yet there are still significant gaps in the literature. In particular, those chosen as biographical subjects in Ireland have often been valued by the significance of their contributions within the paradigm of modern science. This has tended to exclude women as well as non-scientific men from study.¹⁰

English literature, rather than history, has provided the impetus for examining individual engagement with science outside biographies of scientific figures. As Thackeray's words demonstrate, it would be difficult to study nineteenth-century literature and ignore the influence of science. The prevalence of popular science writing during the period has spurred an interest in the history of reading, writing and publishing scientific material.¹¹ The interaction between literary and scientific interests has been demonstrated many times over. In Ireland, the Wilde family is a good example.¹² Furthermore, literary historians have not neglected the study of

9 C.D. Mollan, *It's part of what we are* (Dublin, 2007). **10** For two exceptions, see M. Mulvihill (ed.), *Stars, shells and bluebells: women scientists and pioneers* (Dublin, 1997); M. Mulvihill (ed.), *Lab coats and lace: the lives and legacies of inspiring Irish women scientists and pioneers* (Dublin, 2009). **11** See, for example, J.A. Secord, *Victorian sensation: the extraordinary publication, reception and secret authorship of Vestiges of the natural history of creation* (Chicago, 2000) and G. Cantor et al., *Science in the nineteenth-century periodical: reading the magazine of nature* (Cambridge, 2004). **12** J. McGeache, 'Wilde, Sir William Robert

men of science in their own right: Seán Lysaght's biography of Robert Lloyd Praeger is an exemplary study of an Irish life in science which considers the fullness of Praeger's social, professional and domestic circles and presents a rounded picture of a Victorian/Edwardian intellectual.¹³ Lysaght was aided by Praeger's desire to chronicle his own life in almost as much detail as the plants he studied, highlighting the merging of different forms of writing within a single author. This section offers new perspectives by examining a woman, an evangelical minister and a Gaelic-speaking poet.

As in other intellectual domains, women interested in science were placed in an auxiliary position. Thus, it is significant that the fascinating figure of Mary Ward is here brought to the fore. Although she has received some recognition of late, Éadaoin Agnew provides a new and interesting interpretation of her scientific writing, being interested in how science could proffer a literary mode of expression for those who found it difficult to engage in authorial authority. Agnew situates historically Ward's discursive negotiations while illustrating how science permeated various forms of literature, such as children's literature; this offers an interesting perspective on how nineteenth-century ideologies affected the ways in which science was presented to the public and asks why Ward writes about science in the way that she does.

Agnew's essay on Mary Ward sets her work in context considering closely the gender constraints of the time. Ward's family connections are relatively well known and her work on microscopy and telescropy has long been pulled out of obscurity.¹⁴ Agnew's essay provides instead a reading of the formal properties of writing science, and asks why Ward writes about science in the way that she does.

Agnew demonstrates the value of recovering Irish women's interactions with science. Equally overlooked are nineteenth-century religious apologists, such as the figure examined in Patrick Maume's essay. While this area has been the subject of intense scrutiny in British and American historiography, few comparable studies exist in histories of science in Ireland.¹⁵ In the Irish context, the struggle between Catholics, Protestants and the state over control of education affected each group's view of modern science.¹⁶ Maume's study of the evangelical Dominick McCausland shows how McCausland's denunciations of evolutionary theory selectively imposed material from contemporary popular science over a framework supplied by the pre-millennialist school of biblical interpretation. McCausland blended a surprising array

Wills', *ODNB* online ed. (Oxford, 2004), [www.oxforddnb.com/view/article/29403, accessed 13 Sept. 2010]. **13** S. Lysaght, *Robert Lloyd Praeger: the life of a naturalist* (Dublin, 1998). **14** O. Harry, 'The Hon. Mrs Ward (1827–1869); a wife, mother, microscopist and astronomer in Ireland, 1854–1869' in John Nudds, Norman McMillan, Denis Weaire, Susan McKenna-Lawlor (eds), *Science in Ireland, 1800–1930: tradition and reform* (Dublin, 1988). **15** For example, D. Livingstone, *Darwin's forgotten defenders: the encounter between evangelical theory and evolutionary thought* (Grand Rapids, MI, 1987). **16** G. Jones, 'Scientists against home rule' in D.G. Boyce and A. O'Day (eds), *Defenders of the Union: a survey of British and Irish unionism since 1801* (London, 2001), pp 188–208.

of scientific ideas with anti-Catholic prejudice and ancient history to develop his own history of creation that would exclude evolution.

Finally, Seán Ó Duinnshléibhe's essay offers a completely new perspective on the impact of industrialization and technological change by examining a nineteenth-century Gaelic poem that parodies a group of Cork weavers. Dáibhí de Barra's *Parliament of Weavers* presented the weavers as greedy, crooked and scheming. De Barra's work provides not only humour, but also a technivocabulary of the weaving trade in Irish. At the time when the poem was written, traditional hand weavers were beginning to be challenged by the introduction of mechanized looms, but the *Parliament of Weavers* indicates that the decline of their trade was unanticipated. Ó Duinnshléibhe demonstrates that an examination of Gaelic writers such as de Barra can illuminate the interaction between traditional culture and technological change.

INSTITUTIONS

One of the chief aims of Irish scientific institutions was to modernize Ireland, thereby overthrowing a traditional culture that scientific men often saw as hampering progress. From the eighteenth century, the Royal Dublin Society supported scientific research with the specific purpose of improving agriculture and manufacturing. The RDS's programme included exhibitions, prize essay competitions, laboratory research and public lectures and its significance as a public institution was demonstrated by its substantial annual grant from parliament. The Cork Institution, which Thackeray saw as a shabby failure, had once boasted salaried lecturers in chemistry, natural history, botany, natural philosophy and agriculture. Universities, too, gradually increased their science provision, with the foundation of the Queen's colleges in 1845 proving particularly important.¹⁷ Although ostensibly for the good of the public, each of the above institutions was occasionally embroiled in religious and political controversy and each demonstrated a decided lack of scientific neutrality. The essays in this section highlight the symbolic functions of science and scientific institutions as evidence of modernity and in battles between religious and political factions.

James Murphy's essay, through an examination of science in Castleknock College, contributes to the debate on Irish Catholic attitudes towards science. Murphy's study is one of few examinations of science in an Irish secondary school setting and shows the degree to which science was an important part of the school's education philosophy and public image. Murphy also argues that Catholic views on science are more complex than many authors have suggested. For example, Catholic students could replicate John Tyndall's experiments in physics for an approving audience of the hierarchy, even though the same audience most likely reviled Tyndall's views on religion and evolution.

The relationship between religion and science in nineteenth-century Ireland is

¹⁷ See J. Adelman, *Communities of science in nineteenth-century Ireland* (London, 2009), ch. 2.

further elucidated in Vandra Costello's essay on the Sunday opening of the Glasnevin botanic gardens. Costello's work adds to our understanding of the political and religious divisions at work within the Royal Dublin Society and its conflicts with successive liberal administrations during the mid-nineteenth century. Far from maintaining a separation between politics, religion and intellectual pursuits, the controversy over Sunday opening demonstrates the degree to which cultural and social values were enmeshed with scientific ones.

The Royal College of Science was in some ways a victim of political and cultural conflict within Ireland. As Clara Cullen demonstrates, the college's promise as an innovative institution offering a new type of practical scientific education was never fulfilled. Poor funding, internecine struggles and changing national priorities ensured that the Royal College of Science remained a peripheral organization. Nevertheless, it provided a haven for Irish scientific talent and opportunities for female students not available elsewhere.

If the Royal College of Science's limited success was the result of ambivalent Irish attitudes towards scientific education, such ambivalence was not evident in Dublin in 1857. Sherra Murphy demonstrates that in the year that the British Association for the Advancement of Science visited the city, the Dublin newspapers were united in their desire to impress its members and to prove Ireland's scientific credentials. The reception of the society in the popular press was almost universally positive, though the different political and cultural viewpoints of their writers ensured that Ireland's scientific presence was depicted as variously subject to or equal to that of Britain.

What each of the essays in this volume shows is the diversity of approaches to science in nineteenth-century Ireland. No homogenous approach to science was taken, no monolithic idea disseminated. By examining innovations, individuals and institutions from new angles and including a more diverse array of ideas and actors, this volume contributes both to expanding the existing literature on the history of science in Ireland and to sowing the seeds of future research projects.