

INTRODUCTION

Dublin had eminent men of science, but no recognised Irish school. Hamilton, Graves, Lloyd, Robinson, Stokes, and Kane were known wherever science was cultivated, but known as Englishmen.

Charles Gavan Duffy¹

The importance of science in Irish popular discourse and public culture during the nineteenth century can hardly be overstated. The promotion of scientific ideas and the application of scientific principles and technologies was the impetus for educational institutions, lectures, voluntary societies, periodicals, museums and exhibitions. Irish nationalists, such as Charles Gavan Duffy, hoped that men of science would assume a role in building an Irish cultural and intellectual milieu. Yet the claim of Duffy that Ireland did not have its own school of scientific thought appears, at least on the surface, to have merit. Irish scientific men often looked to Britain, particularly England, as the centre of the scientific community and many Irish institutions were modelled on British counterparts. However, in scientific terms Ireland was not simply England in miniature. This book examines the middle of the nineteenth century, a crucial period for the development of science in Ireland, and asks what values were placed on science in Irish society and how these values were expressed through institutions, activities and publications.

The interplay between government-controlled institutions and ‘indigenous’ scientific organizations in the period 1840 to 1880 permanently changed the Irish scientific landscape. During the 1840s, science was particularly valued as a discourse which could generate economic and social progress; institutions offering scientific education multiplied. By the 1880s, although many institutions had begun as private initiatives, scientific training was almost exclusively in the hands of the government. Through the Queen’s Colleges in particular, the British government embraced the idea that science education could be turned to economic benefit. During the 1850s and 1860s similar sentiments were expressed through popular, and privately funded, industrial exhibitions. Yet the discourse of science for improvement remained only one interpretation of the cultural value for science, which continued to serve as entertainment in the context of scientific

societies and literary journals. The message of the scientific reformers was met by enthusiasm from the government, but failed to fully penetrate other Irish discourses. In particular, science never became a part of the literature devoted to developing Irish cultural nationalism. Despite constant appeals to science's neutrality and suitability for promoting social harmony, the development of science in Ireland was often affected by political and religious controversy.

Science in the Mid-Nineteenth Century

The 'mid-Victorian' period in Ireland was crucial to the transformation of its scientific culture. Richard Jarrell, Stephen Yearley and James Bennett have pointed to this period as one of increasing government control over Irish scientific institutions through the Department of Science and Art and other agencies.² Enda Leaney has offered further evidence for these arguments, showing that the mid-century saw the proliferation of institutions which sought to use scientific education as a means of increasing Irish prosperity.³ Indeed, Irish historians have identified the post-Famine period as one of greater administrative control through the Lord Lieutenant's office and cultural assimilation with England which was supported by improved communication and transportation.⁴ Many functions which had previously been conducted privately were legislated for including education and poor relief.⁵ The British government was willing to make use of existing institutions whose aims matched their own and many scientific initiatives in particular had their origins in voluntary societies or private academies. Despite the unprecedented funding of scientific education, Ireland failed to achieve industrialization on the scale of Britain or to produce comparable numbers of scientific men.⁶ This latter failure in particular has been taken to signify the Irish public's indifference to science.⁷ This book will argue that the Irish public were not indifferent to science: during the nineteenth century science became an important aspect of Irish middle-class culture and identity. Instead, Irish politics became largely indifferent to science as a vehicle for the reform of Irish society. This book is concerned with how the cultural role for science was negotiated in Ireland, rather than with the production of scientific men or even scientific knowledge. This book does not ask 'What did science do for Ireland?' but 'What did science mean to Ireland?'

The cultural prominence of science in nineteenth-century Ireland mirrors the phenomenon in Britain. The mid-Victorian period in Britain has been identified with the processes of popularization, professionalization and specialization, although the definition of each of these terms continues to generate debate.⁸ There was an emerging class of men who found paid employment in science and a concomitant rise in scientific training programmes and in government sponsorship of scientific research and education. Thus the second half of the nineteenth

century is characterized by a growth in government agencies dedicated to science in Britain as well as Ireland.⁹ The Department of Science and Art (1853) was among the most important agencies on both islands. In Britain it oversaw the development of a scientific education complex at the South Kensington site in London. In Ireland it increasingly took Irish institutions under its wing, with varying degrees of cooperation and enthusiasm. Alongside this promotion of 'official science', was an equally important (or even more important) proliferation in popular science. This is evidenced most dramatically in the growth of print literature devoted to science.¹⁰ Despite presenting alternative views of the value(s) of scientific knowledge, popular science tended to reinforce its importance to Victorian society. Therefore this book will compare the promotion of science in institutional and popular contexts in order to show how the cultural value of science was expressed in different settings.

The cultural role of Irish science was forged in an environment which differed from Britain in at least three fundamental ways: the extent of government control; a lack of industrialization; and sectarian divisions. Government domination of scientific education happened earlier and more quickly in Ireland than in Britain. In fact, government sponsorship of scientific activity had been the case since the eighteenth century, when the Irish Parliament generously funded the Royal Dublin Society. The relationship between industrialization and science in Ireland was the reverse of that in Britain. Whereas the industrialization of Britain has been credited with increasing interest in science there, the underdeveloped industry of Ireland was frequently cited as a reason for promoting science. It was this interest in economic development which was the most prominent reason for the promotion of science education in the context of the reform of Ireland. Finally, perhaps the most significant cultural difference between Britain and Ireland was that of religion. The majority of the Irish people were Catholic, yet Irish Catholics were excluded from government by test oaths until Catholic Emancipation in 1829 and were discouraged from attending the only Irish university. Daniel O'Connell's mobilization of Catholics through mass meetings, first in favour of Emancipation and then in favour of Repeal of the Union, created a political lobby united by religion rather than class or party. Thus religion, and particularly an awareness of Catholic feeling, permeated all aspects of Irish society. A growing Catholic professional and middle class meant that Protestant domination of Irish intellectual life was being eroded. New institutions and new literature catered to perceived Catholic needs and tastes. Despite these large differences, there are many similarities between British and Irish scientific developments which this book will highlight.

The Historiography of Science in Ireland

Up until recently, the study of science in Ireland had been largely confined to the study of *scientists* in Ireland.¹¹ Individuals had been selected by their ability to meet the contemporary standards for the category of 'scientist'. Although this has begun to change, there are still substantial gaps in our understanding of nineteenth-century Irish science. Provincial science has attracted substantially less attention than science in the capital. There has also been comparatively less focus on popular forms of science than has been the case in the recent historiography of British and European science. In addition, few studies have attempted to look beyond specific cases and formulate broader hypotheses about Irish science.

A number of narratives have been offered to explain specific aspects of science in nineteenth-century Ireland with reference to its social, cultural and political context. These have tended to focus on a single discipline or a single location. Thus Gordon Herries Davies's work on geology has demonstrated the complicated and often fractious relationships between Irish and British geologists, as well as between the Geological Survey, its employees and the people and land which comprised its purview. All of these factors meant that geology in Ireland developed very differently than it did in England.¹² Ruth Bayles has shown the importance of local circumstances in the development of scientific institutions in Belfast, highlighting the manner in which the Belfast Natural History Society served the needs of a rising professional class of Ulster Presbyterians.¹³ Elizabeth Neswald's work on Galway has underscored the importance of voluntary associations to Irish science and shown that local scientific bodies could be mobilized in response to specific political aims.¹⁴ Neswald's work on the relationship between temperance societies and science also suggests a line of inquiry for a broader study of science in the Irish town.¹⁵ Nicholas Whyte has suggested the application of a narrative of colonialism to the development of science in Ireland from 1890 to 1930. His argument is compelling, but it is less relevant to the earlier part of the century and his examples are drawn exclusively from Dublin-based institutions.¹⁶ Leaney argues that science education was promoted for the development of Ireland but failed to take hold due to public apathy.¹⁷ Leaney, too, has focused on Dublin despite his elucidation of the provincial scientific lectures scheme and a brief look at the Queen's Colleges.¹⁸ This book, therefore, marks a significant departure in terms of the historiography of Irish science by attempting a general picture of the role of science in mid-nineteenth-century Irish society with particular emphasis on the provincial story. The type of overview attempted in these pages is not currently in vogue in the history of British science either and thus the Irish experience may offer valuable points of comparison for British studies.

Cultural Meanings of Science

Arnold Thackray presented a revolutionary idea in the study of the history of science in 1974 when he suggested that science 'was an integral component of the Industrial Revolution' but equally had 'no bearing on the processes of invention and innovation'.¹⁹ Rather, Thackray pointed to the changed cultural meaning and value attached to science during the course of industrialization. Thackray claimed that the cultivation of scientific knowledge was important to the process of 'social legitimation', and further studies of scientific societies have repeatedly reinforced this thesis while applying it to different groups and offering variant definitions. Nineteenth-century Ireland is a great demonstration of the accuracy of Thackray's insight. As a non-industrialized nation, the opportunities for the application of scientific technologies to manufacturing processes were limited. And yet scientific institutions proliferated. Rather than being directly influenced by the presence of industry, scientific enthusiasts in Ireland found a range of different cultural reasons to value science. The chapters of this book represent five different cases in which the cultural value of science for Ireland was negotiated between interested parties. Each chapter asks what men of science, government bodies, politicians, writers, church men and savants were hoping to achieve by promoting or devaluing science in Ireland. By including the efforts of those outside of the elite sphere of intellectuals mostly based in Dublin, a more nuanced picture of the value of science in different cultural contexts may be developed.

Between 1840 and 1880 in Ireland there were a number of distinct claims made for the cultural value of science. Perhaps foremost was that science could reform the country both economically and socially. Scientific societies in particular claimed that they could provide an arena free from political and religious conflict. Although this claim will be familiar to historians of British science, it took on a particular resonance in nineteenth-century Ireland in which religion was inherently political. In addition, Ireland looked with longing upon the increasing industrial prosperity of its sister island. Many felt that propagation of science could lead to economic development either through the encouragement of new industry or the modification of existing ones. In a local context science could assume more specific meanings and serve as a social bond or a source of civic pride.

This book argues that from about 1840 to 1880, the government embraced and promoted science as a means of reforming Ireland and that this discourse became largely separate from other values for science. Thus the chief advocates of the scientific reform of Ireland became government departments and employees (exemplified by the Queen's Colleges), while popular uses of science were essentially limited to recreation. However, instead of relegating scientific recreation

to a lesser value than science in the aid of reform, this book will examine how scientific recreation contributed to Irish society and to Irish identities.

This book examines several types of 'community of science'. By using the term community of science rather than scientific community, I mean to signal my inclusion of participants who would not be classified as scientific men. Each chapter examines a different community and how the role or value for science was negotiated within that community. The first chapter discusses science in voluntary societies, emphasizing the many purposes they served in a civic community beyond the creation of scientific knowledge. The second chapter focuses on the foundation of the Queen's Colleges and the manner in which they drew science into controversies that absorbed political and religious communities. The third and fourth chapters examine how the new colleges interacted with their local communities and attempted to implement the plan of scientific improvement through the agriculture diploma and their museums. The colleges' efforts are compared to private initiatives. The final chapter examines science in Catholic periodicals in order to view in more depth the relationship between science, nationality and religion.

My choice of cases has by necessity excluded a number of disciplines, persons and locations which would be worth examining. I have focused primarily on the sciences of natural history and agricultural chemistry. There are a number of compelling reasons for doing so. These were sciences that were routinely touted as reforming sciences, but were also pursued in the context of entertainment. For example, the proliferation of natural history museums during the second half of the nineteenth century was underpinned by the rhetoric of education and improvement.²⁰ However, museums clearly also served a purpose as rational (or even irrational) recreation.²¹ Thus examining natural history and agricultural chemistry allows me to explore the manner in which the same scientific arena could be mobilized for different goals. It must remain for a future scholar to examine the importance of popular and scholarly astronomy to nineteenth-century Ireland.²² Astronomy and mathematics were rarely touted as sciences capable of engendering reform.²³ The prominence of Dublin in mathematical and medical sciences during the nineteenth century is also worthy of investigation, but is not discussed here.²⁴

Although a degree of universality will be claimed for the arguments presented here, I should acknowledge that I have limited my investigations largely to Belfast, Cork, Galway and Dublin. These were the locations of the new colleges founded during the period in question. The choice of university towns allows me to look directly at how the introduction of government (or church) sponsored institutions affected existing initiatives regarding science. Unfortunately this neglects the interesting question of what happened after mid-century in places like Clonmel, Waterford and Limerick which I hope will be addressed by

future researchers. This book returns to the Queen's Colleges and the Catholic University throughout. The linking of science to secular, government-sponsored education in the form of the Queen's Colleges had wide-reaching impact. The dominance of the colleges by scientific staff demonstrates that the government saw the value of science as its potential for educating productive citizens who would drive the Irish economy, eschewing political agitation and religious strife. This embraced the historical aims of voluntary scientific associations, but it aroused the fears of the Catholic Church. The church responded by the foundation of the Catholic University whose rocky relationship with scientific education contributed to the dominance of the government in this arena. Most of Ireland's prominent scientific figures were associated with one institution or the other. In addition, the example of the Queen's Colleges was considered in the development of civic colleges in Britain and the Empire.²⁵

Ireland had a variety of scientific societies throughout the nineteenth century, although they were most prominent in Dublin, Cork and Belfast. Chapter 1 focuses on Cork and argues that scientific societies played an important role in packaging science in three very particular ways: as a distinguishing scholarly activity, as a religiously and politically neutral social arena and as an element of local reform. The establishment of the Queen's College in Cork altered the locally-defined uses for science by changing the role of the scientific societies. The college became the primary venue for scientific education, while in the societies science was increasingly identified as either rational recreation for the middle classes or scholarly knowledge. The reforming value of science only occasionally resurfaced in the context of specific events. Nevertheless science remained an important aspect of self-definition for Cork's middle-class citizens and allowed them to participate in a shared culture with their British counterparts.

As well as affecting local science, the foundation of the Queen's Colleges influenced national debates on the cultural value of science and scientific education. In particular, the role which religion should take in such education became a fractious issue. Famously, the Queen's Colleges divided Young Ireland (led by Thomas Davis) from Daniel O'Connell's movement despite a shared desire for the repeal of the Act of Union. Young Ireland viewed 'mixed' education of Catholics and Protestants together as important for Ireland's future, while O'Connell feared the loss of Ireland's Catholicity. Chapter 2 argues that supporters of the Queen's Colleges represented an overlap between the liberal political community and the provincial scientific societies. This group advocated vigorously for science and scientific education as a means of reforming Ireland. The ethos of the colleges, with a combination of secular teaching and a broad range of scientific subjects, was derived from these same scientific societies. The Queen's Colleges and their aftermath, including the foundation of the Catholic University, contributed to making science education and scientific appointments a religious and

political issue. Advocates for science education were eventually subsumed into government posts, contributing to the identification of science for improvement with government.

The Queen's Colleges were intended to redress the lack of practical education available to the Irish middle classes. Thus they embraced new scientific subjects including engineering and agriculture. Chapter 3 examines the development of scientific agriculture and its relationship with the farming community and agricultural improving societies. The chapter closely examines developments in Belfast, where the focal point of these communities was the professor of agriculture. Belfast's communities of science were integral to promoting the application of science and European expertise to farming and they saw the diploma as a formalization of their efforts. Nevertheless, the diploma failed to attract significant numbers of students and Chapter 3 demonstrates the difficulties involved in directly applying science in an effort to alter traditional practices. The intransigence of potential students was matched by that of the Queen's College Commissioners who doubted the utility of the project of making farming scientific. Chapter 3 shows that even a science with substantial reform potential could be used primarily for recreation. The chapter also argues that the government's view of reform required the production of tangible results which were not forthcoming.

Efforts to educate Ireland in science extended beyond the lecture halls of the scientific societies and the universities. Chapter 4 moves to the site of the museum and exhibition and examines them as attempts to use science to educate the public and to present Ireland as a place which was being actively improved. Here, too, the Queen's Colleges had a broad impact as they replaced and supplemented local institutions. The colleges opened their museums to the public in an effort to extend the benefits of the university into the local community. Museums are compared to exhibitions in which scientific and national aspirations were simultaneously presented. Ireland hosted a variety of exhibitions during the nineteenth century, mostly centred in Dublin and Cork. Each of these professed to promote the development of Irish industries and to increase the skills of the workforce by providing inspiration. Exhibitions and museums were the visual embodiment of science for the reform of Ireland, but they were also used largely as sights of recreation. The 1881 exhibition also presents an almost unique example of the tying of a scientific agenda to a nationalist and anti-government one.

Outside of classrooms, museums and exhibitions, the Irish public frequently learned about science through print. The nineteenth-century explosion in print did not pass over Ireland. Periodicals, in particular, were seen by a number of groups as a means of consolidating a shared identity. The treatment of science in Irish periodicals presents a convincing case for the use of science as recreation,

particularly among the Catholic middle classes. Other authors have claimed that science held a very marginal role in wider Catholic culture and have named a number of reasons for its apparent exclusion from the process of Irish self-definition. This final chapter demonstrates the degree to which the Irish middle classes found science to be a component of a common middle-class culture with Britain. In the second half of the nineteenth century, Catholic magazines tended to present science as a subject for gossip and passing knowledge, rather than an impetus for economic development and industrialization.

The dominance of Irish society by the struggle for independence in the latter years of the nineteenth century has tended to relegate activities which do not seem to underpin this process to the margins of historical research. As this book will show, widespread interest in science must be deemed an important part of the cultural milieu of Ireland, despite a lack of institutional support after the formation of the Irish Free State. Whyte has argued that the limited funding given to science and scientific education was reflective of the poor economic state of the country and the desire to deal with immediate needs, rather than a specific antagonism towards science.²⁶ The absence of 'big science' from Ireland during the first half of the twentieth century has been equated with an exclusion of science from Irish culture. Some historians have argued that science was a cultural practice associated only with the Protestant Ascendancy.²⁷ As Leaney has pointed out, this depiction is largely accurate if science is defined as an activity which takes place in a university, but is overturned if one considers popular forms of science. However, there is no doubt that Irish participation in science was deeply affected by the religious and political tensions which influenced most other aspects of Irish life. As the following chapters will show, religion and politics were partly responsible for the ways in which Irish people experienced science and how they defined its role in Irish society.