

INTRODUCTION

SCIENCE LECTURES IN AN AGE OF ORATORY

Writing a little over a year before his death in 1895, Thomas Henry Huxley offered his readers reflections on the value of the popular lecture. This form of communication had, over the course of his career, “taxed such scientific and literary faculty as I possessed to the uttermost.” Yet, as Huxley confessed, this enormous expenditure of intellectual energy had, from one point of view, largely failed. It was doubtful whether “more than one in ten of an average audience carries away an accurate notion of what the speaker was driving at.” Why bother, then, clearing one’s throat to address an audience? Huxley explained that the worth of public speaking lay not in imparting knowledge but in its power, altogether independent of the “intellectual worth” of what was spoken, to form and influence the attitudes and affections of the audience. It was on this account that those committed to speaking to the public were in fact “wise in their generation” and “justified by results.”¹

For Huxley, it was the affective power of speech that, in large measure, made the considerable cost of performing popular science lectures over several decades worthwhile. In delivering public lectures, Huxley had, as he put it, “turned to account the peculiarities of human nature” and powerfully “awaken[ed] . . . a sympathy for abstract truth.”² Scientific instruction had for him been a secondary concern, a still vital task reserved for the classroom and for textbooks. Neither was providing some form of light, but fleeting, scientific entertainment the primary aim. The purpose of lecturing had been much more serious and profound. It had, as Huxley argued earlier, been fundamentally religious in its aims and effects, and beyond “mere science.”³ Science by its nature, after all, could not “stir the passions.” The science lecturer, on the other hand, could and should. As a result, the public, made more sympathetic to science, would be inclined to act according to its wise counsel and resist the siren voices falsely claiming

access to truth and public authority. Religious *feeling* would change and no longer be beholden to hoary dogma and superstitious beliefs. The lecturer was best placed to lead this revolution in moral and religious culture, as Huxley's career had shown.

This grand vision of what could be achieved by making use of the “living voice” may sound strange to twenty-first-century ears. Yet Huxley's appraisal of the power of speech motivated and directed the efforts of many prominent science communicators in the last decades of the nineteenth century. These efforts emerged in an era when public culture was saturated with speech of many kinds and in the service of many causes. Indeed, it was a period almost obsessively attentive to spoken address. Motivated by these kinds of observations, the argument of this book is that popular science lectures, understood in performative terms and as thoroughly embedded in a wider lecture culture, were a crucial means for shaping and extending the public authority, affective power and cultural meanings of science. In keeping with this, the book seeks to demonstrate that live lectures, and their afterlife in printed and platform responses, had a reach and impact that have not been sufficiently appreciated. Following five celebrity British scientists who toured the United States in the final three decades of the nineteenth century allows for a detailed account of spoken performances, their copious remediation into print and the energetic responses that frequently followed from them. It also provides an opportunity to explore the significance invested in lectures by those with a stake in securing and reinforcing the cultural authority and moral meaning of science in the late nineteenth century.

In following this line of thought, the book seeks to examine how popular science lectures were understood as a means to transform the moral ordering and religious aspirations of society. It does not pretend to offer a comprehensive overview. Rather, in selecting five popular lecturers (John Tyndall, Thomas Henry Huxley, Richard Proctor, Alfred Russel Wallace and Henry Drummond) and a particular context (the lecture circuit in Gilded Age America) it aims to recast and recalibrate the cultural significance of popular science lectures in this period. The five lecturers investigated in this book were all household names in their day. Their tours attracted profuse press coverage and commentary and this, along with a relative abundance of autobiographical and other archival material that records their own reflections on what it means to lecture well on science, helps to justify the selection. They were chosen, in other words, not because of their scientific stature (though hard to measure, there is clear variability) or because lecturing was a major part of their scientific career (this too varies significantly between speakers) or because they were necessarily talented lecturers (some arguably were, others perhaps not). Rather it is because they

garnered more public and press attention than any other visiting lecturers who dealt with science on the American circuit. Even in the case of Wallace, who struggled to gain a popular hearing, the attention heaped on his tour was significantly greater than that enjoyed by the vast bulk of other visiting science lecturers. This fact allows the “voice of science,” remediated through various sources, to be thoroughly reconstructed, contextualized and interpreted. The five lecturers, and their lecture tours, are especially useful for placing science lecturing within a wider culture of public speaking in a way that parallels and interacts with recent work on the coproduction of science and print culture in roughly the same period.⁴ In addition all five, to a greater or lesser extent, have been the subject of close scholarly attention as individual scientists and lecturers.

Tracking the tours of the five figures that lie at the heart of this book makes possible a fine-grained account of their backgrounds, their American performances and the remediation of those communicative events into mass print. The latter is understood both as a transformative cultural process and as a vital part of the record and reception of the lectures themselves. This focus means that newspaper accounts are of central importance and are approached not only as a form of evidence to reconstruct the lecture tours but also as an integral dimension of lecture culture and, more generally, of the making and contesting of science’s cultural meanings. Press reports are central here rather than incidental, and the book takes seriously the arguments made by others that newspapers—encouraged by technological, economic and political changes—had become a dominant and defining feature of public culture in both Britain and America.⁵ Driven by commercialization and the quest for expanding readerships, newspapers helped fuel the growth of a mass media and transformed the dynamics and characteristic features of both political and more general society. This did not mean that oratorical culture was increasingly drowned out by a torrent of typeset words. On the contrary, the growth of a printed mass media facilitated the popularity, cultural prominence and commodification of public speech. At the same time, it is important to keep in mind that the “power of the living voice,” insofar as it can be re-heard from an age before widespread voice recordings, was widely regarded as providing something more than could be easily captured in print or replaced by it. The popular lecture was, as Donald Scott noted, a “complex form of display,” and its appeal was due in part to its “particular character . . . as a public ritual” and a “dramaturgical event.”⁶

The performative dimensions of lectures are taken here to be of central importance, precisely because they were regarded as such by speakers, listeners and reporters at the time. The science lecture is approached, then, as a matter of vocal and embodied performance, as well as a part of associated cultural practices underpinned by assumptions about the power of public

address. This is not to turn aside from the visual, but instead to explore how the visual and the vocal, or what was seen *and* heard, worked together to produce performances designed to provoke and direct cultural transformation in the name of science. Turning first to an account of the significance of public speech in the nineteenth century will help demonstrate why the popular science lecture deserves to be explored as something much more than a fleeting performance of little cultural moment.

A RISING VOLUME OF SPEECH

Throughout the nineteenth century, the power of speech to express and direct social and cultural change was widely affirmed. If anything, a fascination with public speech intensified in the closing decades of the century, not least because of the democratization of politics and public life. As Joseph Meisel has observed, by the 1880s the mass production and consumption of public speech had reached a zenith.⁷ Lectures, sermons, political speech making, legal disputation and much else besides resounded widely and deeply, not only in their immediate context of delivery but also through the remediation of speech into print. Orality, far from fading in an age of mass print, was revived and reinvented, creating a complex ecology of formalized talk. One contemporary commentator captured something of this in observing that the lecture had become a “thaumaturgic [wonder-working] agency,” preternaturally driving cultural and political progress.⁸

The flooding of the public sphere with a cacophony of passionate voices was also true in the United States. Here, even more than in Britain, the lecture rapidly became a vital mode of spoken address. The lyceum movement, initially patterned on popular education initiatives in Britain (including mechanics’ institutes), expanded rapidly in the early nineteenth century and became increasingly concerned with the organization of series of talks, enshrining the public lecture as a key agent of cultural expression and change.⁹ From the 1840s onward, the lyceum movement became steadily indistinguishable from a more diffuse and diverse lecture culture that flourished first in the northeast before expanding to western towns and cities and, in the Reconstruction era, into the South. This growth was accompanied by diversification, commercialization and the rise of touring celebrity lecturers, often paid handsomely for their peripatetic lecturing. Lecture culture was increasingly scaled up, and the lecture tour, buoyed by an expanding and syndicated press, helped to sustain national and transnational discussions about topics of cultural and political significance. As Carolyn Eastman aptly describes it, by the final three decades of the nineteenth century, American platform culture “functioned as an explosive and innovative site for performance, criticism, deliberation, debate and the embodiment of ideas.”¹⁰ This was despite the fact that the American lecture system was widely regarded

as being in decline from a previous golden age of public speech. Indeed, if the early years of the lyceum movement were looked upon as a period when instruction was properly prioritized over frivolous entertainment, in 1868 one commentator observed that too soon after the lyceum movement was founded the “scholar receded from sight and the impassioned orator took his place.”¹¹ The emphasis on solid and edifying instruction was purportedly endangered by the rise of lecture bureaus, star celebrity speakers and high fees that became more common from the 1850s. Accounts alert to the possible distortive effects of this narrative of constant decline note the prominent role given to entertainment and emotion in the earlier period and later attempts to market lectures as a serious but stimulating alternative to less improving pastimes. Others place the point of decline in the 1880s, when lecture culture, by then apparently beholden to the demand for entertainment, could no longer compete with other staged forms of public excitement. Still, just as it was assumed to have degenerated or been superseded by print, formal education or other kinds of public entertainment, the lecture system was reinvented in new forms and according to new organizational arrangements. The 1880s witnessed new varieties of lecture culture emerge and achieve public prominence. It was at this point that the Chautauqua movement appeared and rapidly expanded, and lecture culture more generally, while perhaps fragmenting in certain respects, became yet more diverse and more vital in political and other terms. Arguably, the lecture tour by foreign visitors was only then reaching something of a high point, at least in terms of public visibility and national prominence.

The dramatic resurgence of orality in public life right across the nineteenth century, propelled and paralleled by the rapid growth in news media, made the lecture platform a potent and near omnipresent feature of American culture.¹² This was coupled with the ongoing development of a shift in the arts of public address that had begun much earlier. This change, sometimes referred to as the “elocutionary revolution,” reconceived the effectiveness of public speech in terms of bodily performance and affective power. In her account of this trend, Sandra Gustafson notes how “gesture, facial expression and vocal tone” became “primary bearers of meaning and fundamental tools of persuasion.”¹³ With the rapid growth of print, the oral transmission of information was no longer the only way to communicate knowledge beyond a small circle of learned elites. This encouraged lecturers to reimagine their trade as an artful performance of individual creative “genius” rather than a learned recital of arcane knowledge.¹⁴ An emphasis on embodied communication became critical for the emergence not only of the literary celebrity but also of the celebrity scientist. The lecture was reconfigured both as a form of speech that involved the public expression of emotions and as a vital technology of celebrity culture.

This trend has been noticed by other scholars interested in the political and cultural significance of oratory in the later decades of the nineteenth century. Jeremy Young, for example, has argued that by the 1870s American oratorical culture was thoroughly infused with the practices and assumptions that had marked the elocutionary revolution. In his study of religious and political orators in late nineteenth- and early twentieth-century America, Young shows that cultural leaders developed “a unique brand of emotional public speaking” that helped to dramatize political and cultural visions on a national stage.¹⁵ It was a style of speechmaking that conveyed an “emotional availability” and deployed “sacralized language” to garner mass support for a variety of religious or political causes and to forge new identities for those struggling with the impact of social upheavals.¹⁶ Young identifies the quest for emotionally persuasive speech as a search for a particular kind of “charisma” and argues that its roots lay in methods of address developed in the early nineteenth century and propagated through the subsequent decades via elocution manuals and private lessons in techniques of public speaking.

This same development influenced oratory in Britain in comparable as well as contrasting ways. Josephine Hoegarts, for example, has argued that vocal performance in parliament moved from being dominated by an “aristocratic theatricality” to a more constrained, conversational and demotic style of address. Emotion was not excluded, but it was more carefully managed and differently pitched. Hoegarts points out, however, that this had the paradoxical effect of reinforcing “the perceived connection between a . . . speaker’s personality and the sound of his voice.”¹⁷ The embodied character of a speaker, even if more subtly expressed, did not diminish in importance. On the contrary, close attention to the physical aspects of speechmaking became more significant, not least because of increased press attention to the vocal performance of politicians at Westminster. The Liberal MP John Bright was a leading exemplar of this new style of political speech, studiously avoiding dramatic gestures and only modulating his voice slightly around a “lower G in the tenor clef.”¹⁸ Yet, Bright still managed to employ sufficient physical action and modulation to powerfully convey emotion, manliness and authenticity without risking charges of eccentricity or artificiality.

One consequence of these changes was increased attention to the embodied character of public speech performances. As Amanda Adams notes, the many mid- and late nineteenth-century accounts of lectures by celebrity speakers on both sides of the Atlantic “are at times preoccupied by *nondiscursive* elements of performance,” including the actions and reactions of the lecturer’s body.¹⁹ Thomas Augst, in a careful analysis of the lectures of Ralph Waldo Emerson, confirms this point, observing that “literary discernment in the nineteenth-century lecture hall concerned itself with in-

cantatory power, with being moved and with hearing what lay beyond ‘mere words.’”²⁰ This fascination with the experience of listening and observing in the lecture hall was of central importance to assessments of the celebrity scientists who take central stage in the chapters to come, even if their bodies functioned in ways that were frequently contrasted to the meaning of corporeal actions deployed by other professional orators. A common refrain in journalistic depictions of speakers visiting from Britain was their relative lack of oratorical flair (it is not surprising that John Bright’s style was taken as a model by at least some British lecturers). This was certainly the case for the lecturers on science who appear in this book. Even so, the nonverbal aspects of their performances were closely observed, dissected, criticized or, less commonly, commended and were often compared with those of accomplished homegrown platform performers. This broad trend toward the affective and performative aspects of public speech, however differently expressed in different places, has not been much noticed in the existing literature on popular science lectures.²¹ As a result of this neglect, the related and deeply held conviction that lectures could dramatically re-orient public “sympathies” toward science and its cultural import has often been obscured.²²

A concern with deportment and vocal performance had, in more strictly delimited scientific circles, its own longer history. In the early and mid-nineteenth century, Michael Faraday was the most prominent example of a science lecturer who exhibited a conscious and determined commitment to the power of spoken address to create a deeper sympathy for science, and the moral practices and meanings that accompanied it, among a wider public. Faraday’s celebrated career at London’s Royal Institution involved, along with extensive experimental work, delivering popular lectures to a range of audiences over several decades. Faraday took the task of lecturing with utter seriousness. Early in his career, he attended classes on elocution and then took lessons from the teacher Benjamin Humphrey Smart. Smart was also invited to attend Faraday’s lectures to provide feedback on his delivery. It was through Smart’s influence, and by way of the example of his scientific mentor Humphry Davy, that Faraday develop his celebrated style of lecturing. Although Faraday studiously avoided the flamboyance of his mentor and avoided excessive displays of emotion, his lectures were designed to move his audiences. As one admirer observed, at the close of his lecture, “Faraday’s enthusiasm sometimes carried him to the point of ecstasy. . . . His light, lithe body seemed to quiver with eager life. His audience took fire with him, and every face was flushed.”²³ If that commentary tells us as much about the observer as it does about Faraday and his performance, it nevertheless captures a common conviction about the power of speech to deeply move both the speaker and the hearer. Faraday’s career can

be understood as a concerted effort to develop a prosody that, while suitably scientific, was carefully staged to resonate with, and develop, his audience's more noble affections.

By the time of his death in 1867, Faraday was widely regarded as the prince of science lecturers. Even if his scrupulous attention to the science of elocution was not followed by others, his recognized ability to command an audience's sympathy and absorb their attention was held forth as an ideal. This, along with his skill in the art of live experimental demonstration, was frequently commented upon. In keeping with wider trends within oratorical culture on both sides of the Atlantic, it was often less Faraday's capacity to impart knowledge or understanding that was remembered than the feelings that were stirred by his overall performance. Those asked to recall the power of his lectures routinely described his arresting presence, the emotional power of his speech and his ability to impart a lasting love of science. Ultimately, Faraday helped to make science resonate in a growing and intense market of passionate and appealing public speech. The importance of science to human flourishing was a deeply emotive subject. Successful science lecturers in the nineteenth century knew this and, often out of sheer necessity and in the face of considerable cultural pressure, regarded the lecture as the key mode of provoking and harnessing the power of public feeling.²⁴

Science, of course, was only one topic among many that piqued the interest and stirred the passions of a lecture-loving public. As Martin Hewitt has suggested, while the science lecture dominated platform culture in early nineteenth-century Britain, its share of a growing lecture market shrank considerably as the century progressed. This paralleled a shift, recently explored by James Secord, in the relative cultural importance of scientific conversation.²⁵ These trends had consequences for the science lecturer seeking a successful career as a public speaker. If, in the earlier period, the spectacle of experimental demonstration was often sufficient to draw crowds, in the later period its appeal lessened. As lecture circuits became more extensive and marked by a greater diversity of approaches, voices and subjects, the science lecturer had to consider more carefully what Hewitt has aptly called the "spectacle of words" alongside the successful use of visual technology and live demonstrations.²⁶ Audiences were becoming increasingly familiar with, and often enraptured by, carefully crafted and delivered talks that relied much less than previously on visual effects to achieve the desired response. This is not to suggest, especially for the science lecturer, that visual aids or experimental demonstrations became unimportant. On the contrary, they retained for many a centrality that spoke of their continuing relevance. Nevertheless, word craft, vocal delivery and bodily comportment, if anything, increased in significance and certainly could not be ignored on

either side of the Atlantic by those wanting success and fame on the lecture circuit.

Setting science lectures within the context of the norms and values invested in public speech draws attention to a competitive field that the lecturer on scientific subjects had to negotiate. But it is also important to acknowledge that each speech event, each lecture given, had its more local coordinates and proximate challenges. In addition to being understood as performances measured against, and dependent on, a set of expectations and aspirations around effective speech acts, science lectures in the nineteenth century can also be approached as events and spoken arguments shaped by more immediate considerations. The general importance of concerns with deportment and vocal performance certainly mattered, but so too did the relations between content, conduct and local context. Thinking in this vein, David Livingstone has drawn attention to the role of local “spaces of speech” in both constraining and enabling scientific argumentation and its reception.²⁷ Precisely where science was communicated in spoken form could profoundly shape what was said, how it was said and how it was heard. Lecturers, in attempting to harness or subvert particular protocols, controversies or expectations, often helped to reproduce and reinforce them. This constraining aspect of how lecture events generated certain kinds of meaning or responses cannot be followed through with the level of detail that might be possible if we were dealing with only a few performances or cultural locations. Even so, pausing longer in places where local disputes, reactions or concerns most evidently impinged on how a lecture was advertised, enacted and responded to points to the importance of geography, or cultural location, alongside a more general set of expectations and norms that informed the conduct of speakers and audiences.

Place, then, certainly mattered. But so too did the often-rapid dissemination of a speech event across a much larger swathe of cultural territory. To take a cue from Erving Goffman’s reflections on formal verbal communication, there was something about the drama and ritual of the lectures that helped them move beyond a local platform to a much wider stage.²⁸ It is this, perhaps more than anything else, that helps explain why a number of events most associated with controversy over science and religion in the nineteenth century were first of all speech acts.²⁹ Thomas Henry Huxley’s 1860 exchange with Bishop Samuel Wilberforce in Oxford and John Tyndall’s Belfast address of 1874 quickly became lightning rods for generating and defining controversy about the authority invested in scientific and religious institutions and ideas. The power to provoke resided, at least in part, with the medium in which the provocations were made. The unstable character of speech, the difficulties in reporting exactly what was said and how it

was said, all added to the allure, fascination and material for myth making. The appearance of spontaneity, the “once only character of the occasion,” the exercise of institutional and social status, and the drama and emotional ambience could all facilitate a sense of the momentous.³⁰

The power of speech events in general, and of lectures in particular, to gain cultural traction and public interest was not, of course, only about the magnetism of the speaker or the timing of an event. While this book singles out individual lecturers for close scrutiny, the purpose is not hagiographic or primarily biographical. Through focusing on individuals who achieved fame on the lecture circuit, it is possible to recover, at least to some degree, the lecture tour as a collective, as well as contested and multivalent, accomplishment made possible by the complex machinery necessary for consequential public speech. Just as book historians have drawn attention to the many agents, instruments, regulatory regimes and processes behind the production, promotion and consumption of published texts, so too studying the world of nineteenth-century lecturing requires attention to the complex infrastructure of lecture culture. As with print culture, platform culture required a “communications circuit” that could include speakers, hall managers, lecture agents, limelight operators and demonstrators, auditors, stenographers, civic leaders and members of learned societies or lyceums, among others.³¹ More particularly, the complex circuitry of lecture culture was thoroughly enmeshed and invested in newspaper and print culture. As already noted, the power of the living voice to evoke the cultural and moral significance of science relied upon, and was in part constituted through, the operations and organizations behind an expanding and powerful fourth estate.

REMIEDIATIONS INTO PRINT

Much of the vitality of the lecture tour in Gilded Age America, as elsewhere, relied on the flourishing and dynamic world of newspapers. There was, increasingly, a powerful symbiosis between platform and press, and newspaper editors saw the lecture as a powerful ally in sustaining and expanding sales. The immediacy of lectures, their trade in fresh talk, made them ideal material for transforming knowledge, and live speech, into news. The cult of personality, the rising culture of celebrity and the importance of publicity further reinforced lectures as worthy of close newspaper attention.³² Lectures and speakers benefitted (as well as suffered) from this partnership, with newspapers acting as a crucial advertising agency both for talks and their authors.

Newspaper reports of the lectures themselves proved to be of great importance. This was captured well by a typically telling anecdote relayed by the American lecture agent James Pond. In his turn-of-the-century account

of the American attorney and celebrated orator Wendell Phillips, Pond remembers how, during an address that could barely be heard because of a particularly raucous audience, the acclaimed advocate of abolitionism pointed to the row of reporters in front of him and instructed his hearers to “go on, gentlemen, go on. I do not need your ears. Through these pencils I speak to thirty millions [*sic*] of people.”³³ Of course, the pencils of reporters and stenographers did not simply disseminate the content of what was said. One of the distinctive features of American newspaper reports of lectures by visiting celebrities was their attention not just to what was said but also to how it was said. This interest in the performative dimensions of platform appearances tracked a wider interest in lectures both as a vehicle for the expression of public emotion and as a vital component of civic culture. The science lecturer had to reckon with these realities. Even if lecturers on science wished to display a different kind of platform persona to the kind that most often attracted fevered attention, this was something that required a careful attention to deportment and delivery. There was a need to avoid a delivery so dry as to be written off as dull and dreary without being accused of a lack of restraint that betrayed the high ideals of scientific objectivity and self-effacement. This was a delicate task. But it was also critical. Often, there was a mutuality at work, with lecturers carefully combing newspaper accounts of their own performances and using them to adjust and improve their delivery.

Along with advertisements and copious records of lectures, the emergence of the interview—of journalists meeting with prominent public figures to record informal exchanges on topical issues of the day—also helped expand and cement the press-platform nexus.³⁴ It was a distinctively American invention and one that visiting speakers could either use to their own advantage or decry as an invasion of privacy or preparation time. Oscar Wilde, who as a young man toured the United States in 1882, provides the exemplar of a visiting speaker who quickly became a master of the art of the newspaper interview. During his tour, Wilde was interviewed by over a hundred journalists and quickly adapted the form to his own advantage. The interviews soon became carefully staged by Wilde and functioned as a platform arguably more important than his lectures.³⁵ In many respects, the American interview was the leading technology behind the minting of Wilde’s celebrity. While this was not true to the same degree of other lecturers, the interview nevertheless became an important component of a lecture tour, often referring to things said, or not said, from the lecture platform and provoking controversies that later colored both how lectures were heard and the reactions they provoked.

The central role played by newspapers raises, of course, the question of using them as a source material for reconstructing the live talk and total

performance of a lecture. On the one hand, the scrupulous (or sometimes unscrupulous) attention paid to lectures by journalists and stenographers makes newspaper reports a profoundly rich source for retrieving important aspects of live talk that otherwise leave little textual trace, including audience response both during and after the event. On the other hand, newspaper accounts could be deeply self-interested, turning lecture (and audience) performances to ends that routinely infuriated speakers and tour organizers. Inaccurate transcriptions abounded, either through sloppy recording or, less frequently, deliberate misquotation. The conduct as much as the content of a lecture event could be reported in dramatically contrasting and contradictory ways. Feuds broke out between newspapers over the cultural import of a particular talk. The recoding of lectures from performance to print was a highly political and precarious process. As such, newspaper accounts can be approached as a particularly significant kind of response to the lectures as much as descriptive reports.

It would be wrong, however, to dismiss the process of remediation, as was so often done by press-wary lecturers, as always and everywhere blatantly distortive. The reports, and reporters, were organically part of the performance; as such, the translation into print can be regarded (at least partly) as much constitutive of a given lecture as an after-the-event representation of it. There is a need to register the seriousness with which stenographers went about their task and to take the opportunity to triangulate between different accounts of the same event. This does not necessarily lead to a more “accurate” record, but it can help to determine the degree to which the message and meaning of a particular lecture was drastically disrupted or revised. Newspapers could be jealous of their reputation to provide exact reports of a particularly significant speech event. And stenographers also had reputations to guard. In some instances, the opportunity exists to calibrate the precision of a particular report against the written script used by a speaker. What emerges is the fact that the main features or arguments of a lecture were often reported with a significant degree of correctness, at least in terms of content. Moreover, it was not uncommon for newspaper editors to circumvent stenographers and simply print a preprepared script delivered to their offices by the speaker. There could also be a rough consensus among different journalists about the nonverbal features of an event—its atmosphere, audience response and the embodied character of a lecturer’s performance. None of this is to deny what Tom Wright rightly calls the “productive flux” of meanings created by the newspaper renderings, reframings and textual placement of lecture reports.³⁶ But newspaper reports need not be thought of as *necessarily* any more accurate or distortive than the phonograph recordings that emerged toward the very end of the period considered here.

Whatever its varied effects, the central importance of newspaper involvement and interest in any lecture tour meant that visiting speakers often took pains to bring journalists onside. This, as we shall see, was certainly evident in the case of Thomas Henry Huxley who—in New York and in Nashville in particular—worked with leading newspapermen to ensure full and positive coverage of his lectures. This was a practice he had developed before he went to the United States (two years previously he had visited the offices of a Belfast newspaper late in the evening and spent two hours correcting reports of a lecture he had delivered), and he put it to good use when he arrived.³⁷ The cultivation of good relations with newspaper editors and newspaper readers was, if anything, yet more significant to Richard Proctor, who, as Joshua Nall has recently shown in his study of the astronomer's alliance with the new journalism of William Stead and others, quite consciously incorporated a journalistic and demotic style into his writing and speaking.³⁸

In cases where newspapers editors could not be easily brought onside, a more negative approach could also be adopted. On occasion, Henry Drummond, for example, was known to request midflow that no record of his lecture be taken. For Drummond, the recording of the kinds of lecture-cum-sermons that made up part of his repertoire could change their character and detract from their positive influence over the spiritual well-being of his audience. He was also shrewd enough to know this tactic often raised rather than reduced curiosity about what he had to say. But as well as this, he was particularly sensitive to the fact that a record of his words could allow publishers to take advantage of still rather inadequate copyright laws and produce extremely rapidly full transcripts of lectures he had intended to revise and print in book form. On this issue, Drummond would have his day in court.

Drummond's approach points to another vital way in which the transfer of vocal performance into the printed word was an integral part of the lecture tour business. Many visiting speakers had their eye not only on increasing sales of existing works they had authored but also on exposing listeners to thoughts that would later be gathered into popular books. The potential financial benefits of lecture tours, particularly in the new and expansive markets for books found in the United States, went well beyond speaking fees. It is well to remember this when interpreting reports of profits made or donated by visiting speakers. There is no easy way to measure how much speakers made through increased book sales or through the production of works based on a successful series of lectures delivered in several US cities and widely reported in the press. That Drummond went to court so that tens of thousands of pirated copies of his US lectures would be pulped (and hurriedly prepared his lectures for official versions) points directly to the

importance of this dimension of lecture tours. Indeed, benefitting in this way was often justified precisely because books written by visiting speakers had so often been pirated in the United States. The lecture tour might be regarded, among other things, as a form of pecuniary revenge.

In sum, then, the machinery of print and platform culture, and the interlinked trends in speaking, hearing and reporting—or what Tom F. Wright calls the “complicated dialectic of reciprocity and resistance between lecturers and reporters”—provide a vital context for understanding the science lecturers who make up the empirical mainstay of this book.³⁹ At the same time, of course, the tours had a longer history and built on trends and personalities that had come before. The longer history of British men of science speaking in America provides another, more concrete historical context in which to place the later tours of Tyndall, Huxley, Proctor, Wallace and Drummond.

BRITISH SCIENCE LECTURERS IN ANTEBELLUM AMERICA

One place to begin an account of the travels, travails and triumphs of British men of science who embarked on tours in Gilded Age America is with the institution that became, for a number of key figures, a platform not just for a lecture series but also for publicizing and funding further speaking engagements. By many measures, the Lowell Institute in Boston led the field in financing the traffic of visiting speakers and attracting celebrity authors. The institute, funded by \$250,000 left for that purpose by the Boston merchant John Lowell Jr., supported the first set of lecture series in 1839–1840 and continued throughout the nineteenth century to use the endowment to sponsor series by speakers of national and, increasingly, international reputation. Although the subject matter of the lectures ranged widely, in the early years at least there was a definite lean toward science. Another more unusual (but not unique) feature was that the lectures, though ticketed, were free of charge.⁴⁰

For the first thirty years or so, the institute did not draw large numbers of foreign lecturers, though a number of those who did accept invitations, such as Louis Agassiz and Arnold Guyot, later became leading figures in American science. Between the commencement of the Lowell lectures in 1839 and 1867, only three British or Irish lecturers crossed the Atlantic to give them. Most famously, the geologist and man of letters Charles Lyell visited and lectured at the Lowell Institute on three separate occasions. The Irish botanist William Henry Harvey and the Scottish Chemist James F. W. Johnston both spoke at the institute during the 1849–1850 season. It was not until 1867, when the classical scholar D’Arcy Wentworth Thompson gave a series of lectures on the philosophy of education, that another speaker from the United Kingdom stood before a Lowell Institute

audience. Thompson, however, was the first of twenty-four lecturers from Great Britain and Ireland to speak at the Lowell Institute in the period from 1867 to 1898. Of these, the majority spoke on scientific topics, but only a smaller portion embarked on a subsequent lecture tour. Even fewer were able to generate significant levels of press attention or make their tour profitable.

Though relatively uncommon, lecture tours by prominent British men of science nevertheless made a significant impact on the American circuit. Charles Lyell's three speaking tours in 1841, 1845 and 1852 set a precedent and pattern for others that followed. In his first tour, the Lowell Institute provided the capital and the springboard to launch a successful tour of East Coast cities. If Boston newspapers did not cover Lyell's lectures in detail, his words appeared verbatim in the pages of the *New York Tribune* after he repeated some of them in New York. The general reception of his first tour was positive, though Lyell's poor speaking abilities were often singled out. As Robert Dott Jr. has argued, it was only the content (including the striking visual aids) of his lectures and his high reputation that overcame his hesitant speaking, weak voice and lack of "imposing . . . action."⁴¹

Lyell's first tour, did, however, generate a controversy with a lasting and distasteful legacy. As Robert Silliman has shown, a number of American geologists became increasingly concerned that Lyell was engaging in a form of intellectual piracy.⁴² Gleaning geological information and ideas from local practitioners, Lyell could then, without due acknowledgment of sources, revise his leading works, produce new editions and make money from their sale. For Lyell, generally scrupulous about acknowledging his sources, the problem was precisely the opposite. It was the loosely regulated American print industry that was profiting from pirated editions of his works. His lectures, too, could be recorded by stenographers and published with alacrity. Intellectual property rights remained a problem for visiting speakers throughout the nineteenth century, one that came to a head when Henry Drummond took an American publisher to court for selling an unauthorized and fraudulent account of his Lowell lectures.

Other science lecturers from Britain, though not invited to give Lowell lecturers, nevertheless toured America with considerable success in the 1840s. The natural philosopher and astronomer Dionysius Lardner was among the most noteworthy. Beginning in November 1841, Lardner spent four years lecturing in towns and cities across the United States, reputedly earning an astonishing \$200,000. Lardner started his tour in New York with a series of twelve lectures delivered in Clinton Hall. By the time he reached the midway point, the *New York Tribune* was printing his lectures verbatim on the front page. The paper later gathered them together with other lectures in the form of a book that went through several editions.⁴³

As Jo N. Hays has argued, Lardner's lectures were not designed to provide fully comprehensive accounts of scientific developments.⁴⁴ Instead, Lardner emphasized character formation and social change. His stress on the practical utility and accessibility of science made his lectures popular beyond a learned elite. According to Hays, these features of Lardner's lecturing success were among the causes of his declining reputation after his American tours. Yet the centrality of character and social relevance to the purpose and power of science lectures was revived to great applause later in the century, making the disintegration of Lardner's always fragile social standing rather than his philosophy of lecturing the more important reason for his failing reputation.

The style of Lardner's lectures was also, by his own account, a vital ingredient in their success. Lardner quite deliberately used extempore address and paid close attention to deportment and vocal delivery. His lectures had a dramatic flair that he had developed earlier in his career through involvement with theater companies in London. Lardner, like many after him, aimed to move his audiences as much as instruct them. The aesthetic and affective appeal of his lectures was further enhanced through novel use of the magic lantern and other arresting visual aids.⁴⁵ This, of course, presaged the thinking and techniques of the British science lecturers who visited later in the century, even if their style was generally more understated and restrained.

The Scottish astronomer and author John Pringle Nichol followed in Lardner's footsteps when he traveled to the United States in November 1847. His lectures in Boston, New York, Cambridge and elsewhere drew large audiences and newspaper attention. It was, once again, in New York that his lectures received the most detailed treatment. The *New York Tribune*, employing the celebrated stenographer Oliver Dyer, recorded Nichol's lectures on astronomy in full and republished them as a pamphlet in the same way they had done for Lardner. The *Tribune's* tribute to Nichol as a speaker noted his style was "at once chaste and impassioned, as eloquent and finished as it is rich and glowing." Like Lardner before him, Nichol had "elevat[ed] the hearts, and kindl[ed] the imaginations and the religious sensibilities of thousands."⁴⁶ This description would not have been out of place in reports of lectures by scientific figures who toured America over the next several decades, demonstrating the prevalence and persistence of the conviction that successful science lectures spoke as much to the heart as to the intellect and were often understood as a means to strengthen moral culture and stimulate self-improvement. What changed later in the century was the insistence that science itself provided the most reliable guide to a moral life.

In speaking in the United States, Lyell, Lardner and Nichol joined American science lecturers in benefitting from, and contributing signifi-

cantly to, the rapid development and commercialization of American lecture culture. As Angela Ray has shown, by the 1840s the lyceum movement had shifted from a set of institutions dedicated to local learning through small-scale lectures, libraries and reading rooms to a more diffuse set of lecture societies that provided the infrastructure for an ever-expanding American circuit. The opportunities to make money through lecturing similarly multiplied, with the expansion of transport links, particularly the railroad, acting as a further accelerant. The three British men of science joined the ranks of American speakers in becoming star performers on that circuit. The American astronomer Ormsby MacKnight Mitchel, for example, drew similar numbers to equivalent applause and approbation, on occasion provoking audiences to “leap to their feet and cheer as at a sporting event.”⁴⁷ Others, such as geologist William Barton Rogers and the chemist Benjamin Silliman Jr., were highly regarded platform performers.

Silliman in particular was instrumental in promoting science as a central topic for popular lectures in the 1830s and played a substantial role in the establishment and early success of the Lowell lectures.⁴⁸ Silliman’s efforts to garner philanthropic and public support for science and science communication were not, however, unique. As Marlana Portolano has shown, the celebrated rhetorical skills of John Quincy Adams were not only put to use to cultivate public interest and support for astronomy. Adams’s oratorical abilities proved critical in persuading Congress to use James Smithson’s generous bequest to fund an institute dedicated to “pure” scientific research and the dissemination of science through a dedicated lecture program. It was fitting, then, that Joseph Henry, first secretary of the Smithsonian Institute, helped to design not just a program of talks by eminent men of science but also a lecture room that was hailed as a “triumph of acoustical science applied to public buildings.” Shaped in the form of “an immense trumpet,” it provided a model space for science lectures until it was destroyed by a fire in 1865.⁴⁹ This disastrous event was not a portent of the end of well-supported science lectures in America. Instead, it occurred on the cusp of dramatic growth in the popularity of science lectures. In the same year, for example, the Wagner Free Institute for Science opened its lecture theater, the design of which was inspired by the one destroyed at the Smithsonian.⁵⁰ Another dramatic development in the years that followed was the rise in the number and popularity of science lectures delivered by foreign, celebrity visitors. This boom time provides the more immediate historical setting for the five lecturers explored in the subsequent chapters of this book.

SCIENCE AND LECTURE CULTURE IN THE GILDED AGE

During the 1850s and 1860s, there was something of an understandable hiatus in terms of science lectures delivered by British speakers in more

elite and established American venues and institutions. John Tyndall's tour of 1871–1872 was the most dramatic reentry of a scientific figure after the Civil War. From that point, British lecturers became a common feature on lyceum programs, particularly on the East Coast. Tyndall's visit came in the wake of Charles Dickens's dramatic reading tour in 1867, which marked the start of a new wave of celebrated speakers visiting America. Dickens's success has been described as "a catalyst behind the boom in such Transatlantic tours," in part because the celebrity author found it to be "golden campaigning ground."⁵¹ Dickens was not, however, alone. The radical lecturer Henry Vincent was another star attraction on the American lecture circuit in the late 1860s. With a long-established reputation for stirring oratory and a public record of support for the North in the Civil War, Vincent captivated American audiences in northern cities in the early years of the Reconstruction era.

From the late 1860s, speakers crossed the Atlantic in greater numbers, trading on their reputation as celebrity authors or orators, or both. As Amanda Adams has argued, both British and American authors anxious to expand the market for their books and create a persona recognized by the masses capitalized on the opportunities afforded by lecture circuits on both sides of the Atlantic. Through public performances of novels by their authors and talks by literary celebrities, the lecture platform became, in Adams's description, "a central part of the international literary world" and one regulated by an "ideal meritocracy of personality."⁵² Of course, it was not only novelists like Charles Dickens and Wilkie Collins who benefitted from this trade in spoken words.⁵³ Authors (and, perhaps more significantly, publishers) of all kinds quickly recognized the marketing opportunities opened up by an expanding transatlantic lecture culture.

The traffic of British speakers crossing the Atlantic was recorded in early fall each year through newspaper announcements of coming attractions. John Tyndall, for example, was placed among a group of British lecturers who included the dramatist Edmund Yates, historian and novelist Anthony Froude, novelist George Macdonald and women's rights activist and celebrated orator Emily Faithfull.⁵⁴ His lectures on the physics of light had to compete with presentations by leading literary and political subjects and figures. The presence of Emily Faithfull among the tranche of visiting lecturers demonstrated the predominance of male lecturers but also indicated a growing appetite for female voices on the American lecture circuit. This appearance of visiting female speakers was not a new development, but the relative novelty still attracted interest and often carried a strong political charge. Faithfull was part of a larger countermovement that challenged the ideology of the public sphere as a space for the exercise of exclusively male authority. A female voice, while still marginal in both British and American

lecture culture, had the capacity, not least in terms of its “vocality” or physical characteristics, to unsettle dominant norms, and, as a result, garner considerable public and press interest.⁵⁵

The visiting science lecturer had to be prepared, then, for comparisons with other speakers on the circuit and competition for column space and critical acclaim. This was not only secured through performance on the platform. The general fuss and elaborate ritual accompanying a lecture tour were also of vital importance. This was most vividly apparent in the tour of the young Irish aesthete and playwright Oscar Wilde in 1882. Unlike nearly all other visiting lecturers, Wilde was virtually unknown and unpublished. His remarkable rise to fame over the course of a year in the United States was driven less by his lectures and more by the captured poses, press interviews, impromptu (but highly staged) public appearances and caricatures that turned so many heads and produced such sensation. This was no more evident than in the twenty-seven portraits of Wilde produced by the New York photographer Napoleon Sarony. The only photographs taken of Wilde during his one-year sojourn, they circulated widely, helping to secure his public image and, as David Friedman has shown, dramatically increased the desire to not only hear but also see him.⁵⁶

The extent of the control Wilde had over his persona, image and message is a matter of contention among Wilde scholars. On Friedman’s account, Wilde’s “genius” lay in his ability to create and control his identity as a celebrity. Others, most recently Michèle Mendelssohn, lean more toward Wilde as the object rather than master of forces that conspired to make him (in)famous.⁵⁷ Mendelssohn’s revisionist account of Wilde’s American tour also stresses the loss of control of Wilde’s image and reputation, and their changing and conflicting meanings, as they circulated through different cultural constituencies. His image, never a singular thing, splintered and proliferated and was quickly pilfered for causes that distorted and derailed the intentions of its original creators. The overlooked backdrop for Wilde’s lecture tour was racial politics. Depictions of Wilde as a simian-like or black “Paddy” did more than cramp the aesthete’s famed style; it threatened the central objective of his campaign. But wherever the emphasis should lie—on Wilde as pawn or Wilde as self-made celebrity—his tour points to the vital roles played by the accompanying apparatus of the speaking tour. Staging a lecture tour meant much more than hiring halls and advertising and delivering talks from the podium. Controlling and contesting the message and the reputation of the speaker on tour was critical.

The five scientists selected in this book for special attention mostly fared well in the game of comparison that was so often played, at least in terms of the level of attention given to them. This is one reason why they and not others have been chosen for detailed investigation. Indeed, this accom-

TABLE I.1 BRITISH AND IRISH LOWELL INSTITUTE LECTURERS, 1841–1898

Lecturer	Year(s)	Subject
Charles Lyell	1841; 1845; 1852	Geology
William Henry Harvey	1849–1850	Cryptogamia
James Johnston	1849–1850	Agriculture
D'Arcy Wentworth Thompson	1868	Education
John Tyndall	1872	Light and heat
Richard Proctor	1873; 1875	Astronomy
Bonamy Price	1874	Currency and finance
John Turtle Wood	1875	The Great Temple of Diana
Archibald Geikie	1879	Geographical evolution
Lyon Playfair	1879	Arts and sciences/public health
W. Boyd Dawkins	1880	Primeval man
Edward A. Freeman	1881	The English people
James Bryce	1881	The Greek and Turkish East
William B. Carpenter	1882	Physical geography of the deep sea
Rev. J. G. Wood	1883	Structure of animal life
Robert S. Ball	1884	Modern astronomy
Edmund W. Gosse	1884	From Shakespeare to Pope
Rev. Hugh Reginald Haweis	1885–1886	Music and morals
Alfred Russel Wallace	1886–1887	Darwinism
James Geikie	1890–1891	The Ice Age
John Murray	1891–1892	Oceanography
Henry Drummond	1892–1893	The evolution of man
Edward Poulton	1893–1894	The colors of animals
Thomas William Rhys Davids	1894–1895	Buddhism
Lloyd Morgan	1895–1896	Habit and instinct
George H. Darwin	1897–1898	Tides
Michael Foster	1897–1898	Brain work

plishment should not be taken for granted, for it was hard won. It was quite possible to fail spectacularly on the US lecture circuit even if one arrived with a reputation as an attractive speaker or with great fame as a scientific author. One example of this was the successive tours of the science popularizer and Anglican clergyman John G. Wood. Although Wood's works on natural history had sold spectacularly well in America and the sketches he executed while he lectured were widely praised, his tours damaged both his bank account and his reputation. This was a view passed on privately to Alfred Russel Wallace by a critic of Wood. Wallace then blamed his own difficulties in securing lecture invitations on his having been billed,

like Wood, as a great English naturalist.⁵⁸ Once Wallace reached America, there was apparently little appetite to hear another great English naturalist speak. Other visiting British scientists did not exactly fail, but either attracted much less attention or simply gave a handful of lectures in one or two places and thus did not really participate in anything like a speaking tour. For example, only a handful of the sixteen British scientists who gave Lowell lectures between 1867 and 1898 (for details see Table I.1) achieved more than regional coverage of their lectures and significantly capitalized on their otherwise high-profile Boston appearances.

The *dramatis personae* explored here have, of course, been selected over and against many other possibilities. Keeping within a British lecturing world (including, in this period, Ireland), one place to start would be to look at the invitees to the Lowell institute from its foundation to the end of the century. Table I.1 provides a list of British figures who gave Lowell lectures. About three quarters of these can aptly be described as scientists (in the contemporary American sense of the term). A number of them lectured only for the Lowell Institute, making their talks of less interest to this particular study. Others did use their Lowell lectures as a springboard for a wider speaking tour but attracted much less attention than the five examined in detail in this book. A few did make a go of it, including the Irish astronomer Robert Stawell Ball. Ball first lectured in America in 1884, after an invitation from the Lowell Institute and, employing the lecture agent James B. Pond, toured more extensively in 1901. Ball appears to have been successful in both financial and reputational terms.⁵⁹ In many respects, Ball entered a field left open by Richard Proctor's decision to quit the lecturing scene after his tour of 1879–1880. This followed a pattern set on the other side of the Atlantic. Ball had replaced Proctor as a Gilchrist Educational Trust lecturer in 1880.⁶⁰ The similarities between the two lecturers are not exhausted by their shared expertise in astronomy. Ball, like Proctor, was strategically circumspect about his own religious views, which tended toward agnosticism. But Ball's American lecture tours, however successful financially, did not provoke anything like the public commentary that Proctor had garnered in the 1870s. Ball may have attracted sizeable audiences, but the newspapers paid him only limited attention. In contrast, all five lecturers investigated here attracted significantly high levels of press interest and left a detailed record of all dimensions of lecturing in the period. Indeed, it is difficult to find an equivalent level of newspaper reporting for public science lectures in the nineteenth century.

The all-male cast is symptomatic of the marginality of female voices speaking explicitly about scientific topics on the elite and profit-making lecture circuit that traded on the celebrity status of foreign speakers. As suggested earlier, success on the American circuit was not foreclosed to

visiting female speakers, but the science lecture, understood in contemporary terms, remained a strongly male preserve. Female voices had long had a place in American educational culture, though one strongly defined by gender norms related to audience, topic and style of address. In the early national period, female educationalists such as Almira Hart Lincoln Phelps offered oral science instruction, later transmitted in printed form, garnering large readerships.⁶¹ The American astronomer Maria Mitchell, too, had occasionally lectured outside her classroom at Vassar College.⁶² The commercialization of lecture culture and its rapid expansion in the postbellum period opened up many more opportunities for marginalized groups to participate in, and repurpose, public speaking. African American lecturers achieved prominence alongside female speakers and used the amplification that lecturing facilitated to champion various urgent social causes.⁶³ At the same time, the emphasis on “star lecturers,” reputation and celebrity meant that to succeed as a science lecturer was in large part dependent on a well-established scientific or public reputation. It was extremely difficult for anyone other than a credentialed male scientist to receive invitations to deliver the kinds of high profile, and well-paid, lectures performed by John Tyndall and those who followed in his wake.

In part because it remained difficult for women to establish themselves as authorities on scientific matters, science lecturers continued to convey a strong commitment to rational discourse naturalized as male. In other spheres, there was a perception that an emphasis on rational instruction had been eclipsed by the importance of personality and embodied presence as the primary driver of celebrity status and attention.⁶⁴ In science, even though personality and embodied performance did count for much, the rhetoric of science as the (male) voice of reason rather than of emotion meant that female lecturers, negotiating with and attempting to subvert gender prescriptions, faced a struggle. It is not that female lecturers neglected scientific topics, but more often than not their public appearances were embedded in talks and events whose focus was on subjects—such as suffrage, temperance and public health—for which women were (increasingly) given a platform.⁶⁵ As late as 1895, when Richard Proctor’s daughter Mary lectured to an audience in Worcester, Massachusetts, on planets, suns and infinite space, a journalist noted that “it was rare to hear a woman speak authoritatively on science, much less on such an abstruse and exacting science as astronomy.”⁶⁶ It is noteworthy, too, that late in her career Mary advised women anxious to perform some “life’s work” to “refus[e] to be drawn aside” by the diversions that the female sex were particularly prone to. Instead, like her, they should give themselves to it “absolutely” so that there was “nothing else to absorb [their] energy or take any of [their] thought or time.”⁶⁷ Mary Proctor had to work extraordinarily hard to elicit

the kind of praise and attention lavished on those male celebrity scientists who, in the previous two decades, had, to greater or lesser degrees, triumphed on the American circuit.

As well as being an all-male cast, the five scientists whose tours are followed here are also wholly British. In this sense, they are unrepresentative of the diversity of visiting science lecturers who were heard on the US lecture circuit during the Gilded Age. But it is difficult in that period to find lecturers from other countries who garnered anything like the same degree of public attention or sparked the same level of public discussion and controversy. One exception toward the end of the period considered here was the German physicist Hermann von Helmholtz. Helmholtz, as David Cahan has shown, was catapulted into stardom when he visited the United States in 1893. Like Huxley and Tyndall before him, Helmholtz became the darling of American scientists and educational elite optimistic about their country's scientific future. Here was a leading figure and "grandee" of German science, a product and champion of German education, who could help America to consolidate its position in international science.⁶⁸ The timing was auspicious, and the tour a triumph. It is worth noting, however, that unlike Tyndall, for example, Helmholtz's performances as a speaker were generally regarded as lackluster. This barely mattered, it seems. By the time of his visit, support for American science, and especially the kind modeled by Helmholtz, was well consolidated. The lecture tours of Tyndall and Huxley in particular, twenty years previously, had helped lay the necessary groundwork. Given his reputation, it was difficult for Helmholtz to do wrong in the eyes, and ears, of his supporters. In the end, however, his tour was more circumscribed and of less moment than those of his British counterparts in the years before.

Another key characteristic of the five lecturers at the empirical heart of this book is that they were all routinely described as scientists. This label, coined by the British philosopher and scientific statesman William Whewell in 1834, was rarely if ever used in Britain even by the 1890s. But in America the situation was different. There, it was already common currency when Tyndall arrived in 1872.⁶⁹ In attracting the level of newspaper attention they did, the tours of Tyndall and Huxley in the 1870s might even be taken as instrumental in securing the word's long-term use on both sides of the Atlantic. In speaking in the United States and attracting mass attention, Tyndall, Huxley and the others who followed helped to forge the public identity of the scientist and shape the cultural meanings and deportment of science as a form of knowledge and a way of life.

There was one final uniting and, I would argue, crucial feature of the five lecturers at the heart of this book that deserves fuller comment. All five dedicated themselves to using their lectures to give science, and a scientific

age, a transcendental meaning and referent. If this is most obvious in the case of Wallace and Drummond, recent work on the religious tenor and intent of scientific naturalists like Tyndall and Huxley (a group that Proctor, somewhat loosely, eventually aligned himself to) points to its relevance in their case as well.⁷⁰ The final section of this introduction explores some of the reasons why this aspect of the lectures was such a critical ingredient for success.

SCIENCE FOR THE PRESENT

When the American historian Moses Coit Tyler surveyed Britain's "lecturing system" in 1869, he diagnosed a fatal flaw. In his view, British lecture culture suffered from an overbearing imposition of "neutrality" on lecture programs. This had led to "discourse upon all subjects, except those which men are most interested in, those vast fascinating problems of political and religious thought." Whether or not Tyler's diagnosis was correct, he had put his finger on a reason for popular support of lecture culture in the United States. Instead of lectures on "sapless shavings pared off from the dead trunk of the past," the American circuit offered discourses enlivened by the "throbbing political and religious interests of the Present." Without this essential aspect, lectures would become merely "instructive," generating an appetite not for noble thoughts, whether from philosophy, art or science, but for "musicians and buffoons."⁷¹ This view was shared by one of the key actors in Gilded Age lecture culture, James Redpath. As director of the leading lyceum bureau, established in 1868 to organize tours for notable American and visiting speakers, Redpath's view was that any local committee or lyceum "afraid of political or other living questions are sooner or later consigned to bankruptcy."⁷²

Tyler's and Redpath's appraisal of American lecture culture sits uneasily with the regulative ideal of neutrality that was commonly appealed to on both sides of the Atlantic. Unlike parliament or a church, the lecture hall was designed to be nonpartisan, a liberal space for free expression of opinion on subjects that united rather than divided a community of listeners. Science increasingly could be, and was, formulated in such a way as to make it the exemplar of liberal speech, neutral on matters political or religious and free from prior metaphysical or ideological commitments. By the 1870s this powerful rhetorical construct—science as free and liberal speech—could take different forms. Some refashioned a natural theology that had, in early decades, been claimed as a common discourse to unite otherwise opposing religious groups. Others were drawn to a conception of religion as private feeling and science as the only valid route to definite, accountable knowledge. But however conceived, the idea of science as free and liberal inquiry, and therefore as a fitting topic for a public lecture, faced a challenge

hinted at by Tyler and Redpath. How could it avoid degenerating into instruction about the material world that carried an indefinite or nonexistent transcendental meaning and lacked the urgency (and excitement) of moral imperatives or political debate?

One way to overcome this was to pursue a high ambition to unite religious meaning and sentiment with an elevated view of science but in ways ostensibly free from partisan ambition or intent. For the lecturers considered here, evolution (biological or cosmic) supplied a common grand theme that provided a way to reconceive the place of religion in a world of science and render the latter meaningful in broadly religious terms. The exact outworking of this ambition differed from speaker to speaker. But all five harnessed the power of speech to convey a lively religious vision for a scientific society. None of them saw the lecture as a particularly effective way of conveying ideas or information. All subscribed to Huxley's view that the lecture was a potent means for provoking and transforming affections and sympathies. Among other things, their lectures operated as ritual forms for the passionate promotion of a new mythos to replace more traditional articulations of religious belief. They were each, in their own way, following Emerson in using the lecture to create what Augst describes as a "visceral immediacy" and a "secular conversion experience."⁷³

For Tyndall and Huxley, this took the form of an appeal to the ineradicable but nebulous world of feeling, which for them was beyond the reaches of science even while necessary for its very possibility. For Proctor, the power and allure of science lay in its termination in the mystery of the unknown that he, more than Tyndall and Huxley, was content to call God. For Wallace, evolutionary science reached its material limits with the emergence of spirit, a conviction that thoroughly colored his entire tour. And for Drummond, science in general and evolution in particular offered patterns and trends that revealed the truths of a gospel of love in ways that revived, even as they transformed, traditional Christian belief.

To some degree, the lecture tours also carried certain political and social messages and, as a result, provoked a range of energetic responses. John Tyndall, for example, was happy to gently chide his audiences about the state of American science while also charming them with counterbalancing praise. Tyndall thus articulated a form of Anglo-American relations that played well in postbellum United States (in the north at any rate). Richard Proctor, on the other hand, was much more effusive in his direct praise of American science, particularly American astronomy, in ways that reflected and reinforced his antagonism toward institutional science in Britain. The political opportunities afforded by the presence of leading British scientists in American auditoria were also used to advantage by local supporters. The fact that more than one of the visiting speakers attracted the incumbent

president of the United States and many other elite statesmen further signals the political complexion of the tours.

Though these political notes undoubtedly helped to generate public interest, the religious bearing of the tours provoked the most vocal and voluminous public reaction. Lectures responding to lectures, reactionary letters to the newspapers and pulpit condemnations and commendations were only some of the ways in which the lecture tours fueled the engines of public debate. Each tour generated these and other types of responses from different constituencies and on different grounds. Whether provoking these reactions was intentional on the part of the lecturers, or whether it represented a primary aim of their tours, the religious implications and inflections of their spoken arguments played a dominant role in commentary on the meaning and wider consequences of their lectures. It was this, perhaps more than anything else, that gave these speakers cultural traction and helped them give their audiences performances that pulsed with metaphysical and religious interest.

The performative dimensions of speaking took on particular importance when metaphysical and religious matters came into play. If, as was generally the case, science as such—in an ostensibly pure form—was thought to be best delivered in a style of speaking confined to a narrow emotional range, any religious or moral implications of scientific ideas or a scientific attitude tended to invite a more exuberant performance. Audiences, or at the very least, journalists had a particular ear and eye for that element of speech that was, as Erving Goffman phrases it, “about more than textual transmission.” When a speaker moved to matters ostensibly beyond science this was regularly noticed and commented upon. The perceived religious stance of science lecturers tended to produce vigorous and locally conditioned responses. David Livingstone’s close study of engagement with Darwinism in several Calvinist conclaves provides one compelling demonstration of this.⁷⁴ It is not surprising, then, that the clotted and complex religious culture of Gilded Age America meant that metaphysical claims provoked contrasting and hotly contested reactions as a lecturer moved from place to place.

The chapters that follow do not pretend to provide a comprehensive or fully representative account of science lectures in Britain and the United States during the late nineteenth century. They also intentionally leave largely in the background aspects of science lecturing in this period that have been well studied by others, not least the place of demonstration, live experimentation and new visual technologies.⁷⁵ Instead, tracking the formation and fortunes of five British science lecturers who were, or became, household names on both sides of the Atlantic allows for an analysis that brings verbal and embodied performance, remediation and response in the context of

oratorical culture into closer view. It permits, in other words, an elaboration and detailed exploration of the book's argument that science lectures were widely understood to be vital agents of cultural change and as embodied performances designed to inform and restructure the beliefs and feelings as much as the visual intelligence or intellects of their hearers and readers. The emphasis given to style as much as substance is not to deny or to ignore the importance of the content, rhetorical or substantive, of the lectures as textual products. But it arises from an approach that seeks to uncover a hitherto neglected but, as I want to argue, crucial aspect of speaking for and about science in an age of popular oratory, namely the evident value placed on the conduct as much as the content of science lectures with mass appeal.

Each chapter begins with a detailed account of the origins and development of the lecturing careers of the speaker, foregrounding their style, attitudes to lectures and experience of delivering them. Attention then turns to the performances, places and cultural correlates that strongly informed the main aims and outcomes of their American lecture tours. This means paying close and sustained attention to how each lecturer cultivated their approach and attitude to public speaking and to how, where and to what ends the five speakers delivered their lectures. It also provides a focused sense of the wider platform culture in which their lecturing careers began. With that individualized context in place, the chapters then reconstruct the speaking tours in the United States. The huge public interest they generated has left a rich and diverse set of descriptions that allow a detailed account to emerge of vocal and embodied performances, of cultural location and local circumstances and of the intricate, dialectical relations between platform and print (especially newsprint) culture. The stories that follow will, I hope, offer dramatic and colorful reconstructions of the dynamic landscapes of talk and text that, in the ears and eyes of many, helped make science lectures events of deep, if always contested, cultural significance.