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Marconi, Masculinity and the Heroic Age of Science: Wireless Telegraphy at the British Association Meeting at Dover in 1899

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Abstract

In September 1899, at the annual meeting of the British Association for the Advancement of Science (BAAS) in Dover, Guglielmo Marconi's wireless telegraphy system was used to transmit messages across the English Channel (and across a national border) for the first time. This achievement represented a highly effective performance of scientific masculinity and constitutes a key turning point in an important struggle between competing interpretations of invention and innovation as masculine practices within British science. The British Association, tended to favour a narrative of scientific research as a collectivist, international, gentlemanly-amateur pursuit, largely confined to the laboratory. Marconi, by contrast, explained the development of wireless telegraphy as the achievement of his own genius. Appealing not only to the established scientific elite but to a range of non-traditional audiences, and stressing the possibilities or 'imagined uses' of his technology even more so than his actual results, he succeeded in commanding unprecedented influence.

Keywords: wireless telegraphy, masculinity, Marconi, British Association, science

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Focusing on the analytical category of 'imagined use', this special issue seeks to move away from the so-called 'great man' theory of innovation and invention. Instead, it highlights the need to include a more diverse range of social groups within the history of innovation and use, especially those marginalized in traditional narratives. In particular, it calls for attention to be paid to those who, while not necessarily coming into physical contact with telegraphy, nevertheless engaged imaginatively with it and so affected the conditions of its use and development. At the same time, though, it is important to remember that the 'great man' theory, while certainly inadequate as an explanatory tool in the history of innovation, nonetheless existed as a popular idea and rhetoric, an important ideal of scientific masculinity, which many people believed in and consciously used to promote themselves and their inventions. Ironically, a focus on the construction of the cult of great men, the 'powerful actors' mentioned by the editors in their Introduction, shows how the phenomenon links inventors, actual users of technology and much greater numbers of non-users. Certainly in a special issue focusing on 'imagined uses', on the emotional and imaginative investment which people made in new technologies in the past, the cult of masculine 'greatness' which gathered around (and was often deliberately cultivated by) particular inventors is an important topic to analyse.

As we shall see, to a significant degree, the aura of greatness which surrounded a particular inventor was not generated by actual results (technology-in-use), but by what the public imagined the individual (and the technology) to be capable of in light of both real

demonstrations and the inventor's claims about what might be possible in the future. Thus, while the 'great man theory' should doubtless be challenged, if not discounted, as an explanation for scientific change, as a constitutive part of the history of science and technology, and the history of invention, more specifically, it deserves proper consideration. It is the aim of this essay to investigate the construction of the 'great man' persona in the case of one, particularly illustrative example: Guglielmo Marconi, who has been described as the 'first entrepreneur of the electronic age,' amid the launch of his wireless telegraphy in the late 1890s.[1] Marconi provides a clear example of a man who ruthlessly promoted himself as a great inventor, whose success and influence were the products of his own genius.[2] It was not so much his technology which he marketed as himself and his potential as an inventor through appealing to his audience's imagination; moreover, many people from different social backgrounds and different countries bought into his project of self-marketing, funded him, promoted him and purchased his services.

Marconi's deliberate self-fashioning as a 'great man', and the interest, belief and investment in him which this seemed to generate posed an unprecedented challenge to dominant understandings of what a scientist-inventor should be. This was especially so in the British Isles, where Marconi spent his early years as an inventor and entrepreneur, and whose scientific elite, represented by the BAAS, he went to considerable lengths to cultivate. As we will see, in British scientific circles, the 'great man' cult was distinctly unpopular when it came to living individuals; it was almost exclusively reserved for the glorious dead – for figures like Isaac Newton. Since its foundation in 1831, the BAAS had been strongly influenced by a collectivist ideal of scientific discovery and progress, inspired by Francis Bacon's New Atlantis, which stressed the sublimation of individual effort and achievement to the collective good. This vision of science chimed well with the Association's continuing idealization of scientists as gentleman-amateurs, individuals who

devoted their time to science with little thought of developing practical applications of their discoveries for profit or personal fame. Marconi's attitude offered a stark contrast with these views. He presented himself as an inventor of technology; the members of the BAAS were, in their own words, 'cultivators of science'. The challenge Marconi offered to their world view helped to set alight longstanding debates in British science between so-called 'theoretical' and 'practical' men, between the BAAS, who were mostly amateurs or university academics, and professional scientific men such as electrical engineers like W.H. Preece.[3]

A key moment which captured these tensions and revealed the force and significance of Marconi's alternative model of scientific masculinity was the 1899 meeting of the BAAS held in Dover. This essay focuses on this meeting as the crucial point when Marconi's appeal to the imagination of scientists, journalists and the general public clashed visibly with the gentleman-amateur ideal of the BAAS, where individual achievement was subordinated to the vision of science as a collective effort. Although Marconi first came to England in 1896 and attended BAAS meetings in 1898, it was the 1899 meeting which represented a tipping point in terms of his self-promotion as an archetypal 'great man' inventor. By the point at which his equipment was used to publicly demonstrate wireless telegraphy across a national border for the first time, Marconi had become so successful that he no longer felt it necessary to appear in person alongside his technology. Indeed, it is one of the first times in the history of British science that a public reputation built on assiduous self-promotion through the media and carefully staged publicity stunts trumped the need to win over the traditional arbiters of scientific (and masculine) reputation – the British scientific elite represented here by the British Association.

The essay will begin by examining the events of the meeting itself and exploring the tensions which they reveal within the British scientific community. It will then move on to explore the collectivist

ideal of scientific masculinity which prevailed in BAAS circles at the end of the century before discussing the challenge posed by Marconi's deliberate self-fashioning as a 'great' inventor to traditional masculine understandings of the scientist. It will conclude by analysing the reaction of the British scientific elite to Marconi's self-promotion and success and will reflect on the longer-term implications of the new model of scientific masculinity which he represented.

The Dover meeting

When the BAAS assembled at Dover in September 1899, they witnessed the first public demonstrations of Marconi's wireless telegraphy across a national border. The technology had been installed by Marconi himself in Dover's town hall and was used to convey greetings and messages of friendship to *L'Association Francaise pour l'Avancement des Sciences* which was holding its own annual meeting concurrently on the other side of the Channel at Boulogne. The priority for the organizers of the BAAS meeting in displaying Marconi's technology was to present it as yet another illustration of the strength and solidarity of the international brotherhood of science. By contrast, many British newspapers focused solely on Marconi, 'the great inventor,' and his achievement.[4] In a letter to the *Times*, written in the wake of the successful demonstrations, the British electrical engineer, J. Ambrose Fleming, praised Marconi for bridging 'a vast gulf [that] separates laboratory experiments, however ingenious, from practical large scale demonstrations,' for translating 'one method of space telegraphy out of the region of uncertain delicate laboratory experiments, and plac[ing] it on the same footing as regards certainty of action and ease of manipulation…as any of the other methods of electric communication employing a continuous wire between the two places.'[5]

The British Association was no stranger to public demonstrations of what Gillian Rose has termed 'scientific masculinity', the ability to measure, control and ultimately subordinate nature.[6] Indeed, it had functioned as a pivotal site for the announcement and initial demonstration of many important discoveries in science throughout the Victorian period. Famous explorers who had travelled to distant parts of the world previously unknown to the West recounted their adventures to enthusiastic audiences of BAAS members.[7] It had been a major part of the Association's remit since its earliest days to publicize the latest scientific research and generally to interest the public in the business of scientific discovery. Despite the periodic highlighting of individual contributions, however, when communicating with the public, the BAAS had invariably employed a powerful rhetoric of collective effort and altruistic service for the benefit of mankind as a whole.

By contrast, when Marconi's wireless telegraphy was demonstrated at Dover, a very different note was struck. Journalists describing what had been witnessed during the meeting attributed all responsibility for the new technology to the Italian inventor. As historians like Sungook Hong and Graeme Gooday have shown, Marconi's wireless system was the end product of a complex research and experimental process involving many other individuals, most importantly, the British electrical researchers, and prominent members of the BAAS, Oliver Lodge and Francis FitzGerald.[8] Innovation was, as the editors of this special issue rightly point out, fundamentally, a social process. In other ways, too, the demonstrations of Marconi's wireless telegraphy were exceptional. They were not carried out as part of the traditional scientific portion of the meeting: the sectional discussions; rather, they accompanied the delivery of an evening lecture given by J. Ambrose Fleming entitled "A Centenary of Electricity" and were repeated during breaks in the formal scientific discussions. Seen in this way, the chief goal of the demonstrations appears to have been to entertain and impress the assembled crowds of British and French men of science, their

families and friends, rather than to contribute to the scientific debates of the meeting.

Here, we see a good example of 'imagined use' being employed as a marketing tool. The dramatic and spectacular demonstration of Marconi's wireless telegraphy appealed directly to the imagination of the crowds gathered at Dover in 1899. Not only was the audience left wondering about the possible capabilities of wireless telegraphy (the demonstrations taking place unaccompanied by detailed scientific explanations); they were also left wondering about Marconi himself. Upon establishing that his technology had been adequately installed and proper tests had been carried out, Marconi embarked on a sea voyage across the Atlantic, leaving Dover the day before the meeting officially commenced. This decision, it seems, had been carefully stage-managed by Marconi, ensuring maximum speculation, both among newspapers and the crowds assembled at Dover, about why he had left early. Some journalists queried whether his absence should be interpreted as a considered insult to the BAAS, which had by no means always been friendly towards the inventor.[9] While Marconi's real reason for departing early was his desire to enable the *New York Herald* to report the results of the Americas Cup race as quickly as possible via the installation of wireless telegraphy, the crowds at Dover were left to ponder the reasons behind Marconi's departure.[10] His physical absence from the meeting, then, arguably created greater public interest in his person and activities than his actual presence would ever have done.

The 1899 BAAS meeting at Dover was, for Marconi's purposes, a publicity-raising event. He was not interested in the activities of the Association *per se*. A year earlier, however, this had not been the case. With the development of his wireless telegraphy in a much earlier phase, Marconi had visited the 1898 meeting of the British Association at Bristol in person accompanied by the Post Office's chief electrical engineer, W.H. Preece, in the hope of being allowed to present his new technology and discuss its potential. In the

interval between the two meetings, however, much had happened. Employing high antennae and long waves, Marconi had succeeded in sending messages via wireless telegraphy between Queen Victoria's home at Osborne House on the Isle of Wight and the royal yacht, *Osborne*. He went on to transmit successfully between the Needles, once more, on the Isle of Wight, and the East Goodwin lightship some thirty kilometres away. Finally, a few months before the Dover meeting in Spring 1899, Marconi transmitted signals from one side of the English Channel to the other.[11] The British Association played no role in these achievements; it was rather private and commercial investment in his technology, above all, from the British Post Office and Marconi's own growing company (established in 1897) that ensured the success of his experiments.

Science, masculinity and internationalism

Marconi certainly represented a radically different ideal of scientific masculinity from that which dominated the British scientific establishment at the end of the nineteenth century. It was, above all, perhaps, his determined self-marketing and deliberate appeals to the imagination of his audiences which distinguished him from the most prominent scientists in the BAAS – men like Oliver Lodge – who, in the details of their research, were very close to Marconi's own work. Lodge, like others in the BAAS, claimed that Marconi had illegally appropriated his ideas and developed them further without his permission. There was still a pervasive assumption within the British Association, and within British science, more broadly, that research (which included the development of technology and the application of science) was still a collective effort, where no one individual should dominate the rest. Although he carried out his own experiments with wireless telegraphy at no less than three BAAS meetings in the early 1890s, Lodge had not patented his equipment, nor had he sought to market his technology commercially.[12] This reluctance to pursue financial advantage from

his research and to engage the broader public about his work reflected an ideal of the scientist as a selfless seeker after truth, a leisured paragon of moral manliness, still prevailing in BAAS circles in the 1890s and early 1900s.[13] This ideal had been well-expressed by M.E. Grant Duff, president of the BAAS Economics and Statistics Section in 1867:

> A determination to receive every fact with equal favour, a determination to restrain not only all the ordinary disturbing prejudices, but even that love of hasty generalization which is characteristic of fine intellects, a spirit resigned to collect, one by one, the stones of the temple which a successor may build up, - these are the marks of a true [scientist].[14]

This view of science had deep roots in the culture of the British Association, going back to its earliest days in the 1830s, when the majority of members were classically-trained gentleman amateurs, men of wealthy, leisured families who did not need to exploit their inventions or discoveries commercially; indeed, to do so was felt by many to be unseemly, even unmanly. Following the ideal of a great scientific collective, set out in Francis Bacon's vision of the New Atlantis, familiar to many Victorian men of science from their Oxbridge education, the individual was expected to sublimate his own ambitions for the good of the whole. There had always been a strong bias against so-called 'professional men' within the Association; those working in industry or for commercial enterprises rarely gave papers or rose to positions of authority within the sections or the General Council.[15] The Association remained dominated by the elite culture and prejudices of Oxford and Cambridge, whose students and teachers had taken the lead in its early years.

In 1899, the BAAS ideal of the humble researcher striving for the common good was still profoundly shaped by a deep-rooted scientific internationalism which had characterized the Association and guided the actions of its senior members since the 1830s.[16] As one of its founders, William Vernon Harcourt, explained in a speech at the inaugural meeting of the

BAAS at York in 1831, one of the body's chief aims was 'to promote the intercourse of the cultivators of science with one another and with foreign philosophers.'[17] In succeeding decades, the BAAS welcomed many 'foreign' or 'corresponding' members, mostly from Germany and France, who regularly came to meetings and reported on proceedings in their home countries; likewise leading members of the BAAS spent considerable periods of time training abroad at foreign universities, above all, in Germany, and enjoyed deep, personal and professional ties to the scientific community in continental Europe. In its early days, the Association's founders had consciously modelled it on a German precedent, the *Gesellschaft Deutscher Naturforscher und Ärtzte*, founded in 1822, for the purpose of uniting scientists and physicians in the various German states.

When describing scientists as a collective in its published annual reports and presidential addresses, the BAAS stressed their masculine independence and freedom from petty national concerns and state interference; when referring to individual scientists, however, BAAS publications tended to minimize their originality and significance, subordinating them to a great collective effort and chastising those who sought personal glory. By presenting his technology as the product and embodiment of his own genius, Marconi, by contrast, rendered the public demonstrations of his wireless telegraphy equally spectacular demonstrations of individual masculine force. In so doing, he pointed the way towards twentieth century models of scientific masculinity and technological modernity which were much more tightly focused on the cults of great living scientists and inventors.[18]

When the BAAS met at Dover in 1899, it was with the deliberate aim of celebrating and promoting the international brotherhood of science. The choice of Dover was unconnected with Marconi's plans for demonstrating transnational wireless telegraphy. The main incentive for the BAAS was the fact that their sister body in France was itself meeting in Boulogne during the same week. An article which appeared in the *Freeman's Journal and*

Daily Commercial Advertiser on 14 September 1899 reveals much about how ideals of internationalism and collaboration still coloured British understandings of scientific masculinity in the late nineteenth century. Scientific progress, which had come to define the Victorian era, was driven, the article's author argued, by the fact that 'each man of science was not his own master, but one of many obedient servants of an impulse which was at work long before him, and would work long after him.' Science, for this writer, was a noble quest, raising its practitioners above narrow issues of national and imperial identity. 'To the man of science', he declared, 'the barriers of manners and speech which pen men into nations become more and more unreal and indistinct. The touch of science made the whole world kin.'[19] The whole meeting at Dover seems to have been characterized by this atmosphere of scientific internationalism. Messages of welcome and greeting were passed to the French Association by means of wireless telegraphy and groups of up to three hundred people exchanged visits with French colleagues across the Channel throughout the week-long meeting. It is also notable that many English scientists spoke French with their French colleagues and vice-versa. In a tradition continued from the early days of the BAAS, discussions were multilingual, reflecting the continuing influence of a much older culture of scholarly cosmopolitanism. The British astronomer, Norman Lockyer, recorded that 'when he saw the two presidents – Sir Michael Foster and M. Brouardel – walking arm in arm on the promenade it seemed to him that henceforth patriotism, as opposed to the best interests of humanity, had ceased to exist.'[20] Such expressions were fully in-keeping with the way that the British Association, as a body, had seen itself from its early years, as the harbinger of a peaceful, moral manliness in contrast to the destructive and selfish, masculine force of war. This contrast was captured well in a poem written on the occasion of the third meeting of the BAAS in Cambridge in 1833 by William Sotheby:

> But thou, celestial peace, thy olive rear

That knows no taint of blood, no orphan's tear

And wreathe thy sons who league to bless mankind

To spread the conquests of the enlightened mind

The inert mass of matter to control

And stamp on all the sovereignty of soul.[21]

Marconi's wireless telegraphy was, moreover, interpreted by many within the BAAS as one more means of bringing the world closer through science. In his evening lecture, Professor Fleming worked hard to write Marconi and his wireless telegraphy into this vision of science as a work of collective effort. His main aim in the lecture was to celebrate the hundredth anniversary of the discovery of the electric current by Alessandro Volta in 1799. Beginning with Volta, he concluded with the development of Marconi's version of wireless telegraphy, suggesting thereby that Marconi's invention should be viewed as the glorious finale of a process which started with Volta. It seems highly probable that Fleming intended his audience to apply the praise he lavished upon Volta's discovery - 'epoch-making in the history of the world' - to Marconi's system of wireless telegraphy whose working was on display during the delivery of the lecture.[22] Once again, we see how, in Marconi's absence, imagined narratives of scientific and technological progress were constructed and rehearsed with the aim of enhancing Marconi's public reputation as a great inventor. However, it is important to note that although Fleming lauded Marconi's achievements as remarkable, he did not present them as being without precedent. As the BAAS president for 1923, Ernest Rutherford, described the previous century, it had been the 'heroic age of Physical Science', but no individual hero had been bigger than the age itself.[23]

Marconi, imagination and an alternative ideal of scientific masculinity

It is clear that Marconi, with his carefully managed publicity stunts and self-marketing strategy, appeared to many commentators to represent the polar opposite of the internationalist vision of science favoured by the BAAS. Earlier, we mentioned that he had previously struggled to gain access to the scientific establishment in Britain. The difficulties he encountered were particularly visible in his attempts to engage with the British Association. Despite first attending a meeting back in 1896, Marconi never became an insider at the BAAS. Preece had introduced him and his work on wireless telegraphy to the Association in 1896; and in 1898, despite being physically present at the Bristol meeting, the *Bristol Mercury* passed over Marconi's role, reporting simply that 'Mr W.H. Preece…has arranged to have an exhibition of wireless telegraphy at the Conversazione at Clifton College.'[24] The contrast is stark indeed if we compare Marconi's relative exclusion from British scientific circles in 1898 with just one year later at Dover, when he was so confident he felt able to leave before the meeting even started. This is not to say, however, that he did not do all he could to advertise the demonstrations of his invention before his departure: speaking to newspapers and journals, writing and releasing press statements. Many newspapers covering the story followed Marconi's line closely, highlighting the peculiar significance of the inventor himself; few referred to the BAAS or the aims of the meeting at Dover; in many accounts, indeed, the meeting did little more than assume the function of a stage on which to play out the narrative of Marconi's 'great man' theory of scientific progress and technological innovation. In this vein, a writer for the *Pall Mall Gazette* declared, 'Signor Marconi is preparing a little eye-opener for the British Association.' With the BAAS firmly cast in the role of ill-prepared pupil, the same writer announced that 'Mr Marconi has fairly caught and tamed the lines of electric force'.[25] In another article from the *Sheffield and Rotheram Independent*, based on a statement which Marconi released to the press himself, the Dover meeting is depicted merely as the latest in a

long line of 'wonders' wrought by Marconi's scientific genius.[26] Here we see Marconi deliberately offering the reading public an alternative history of scientific and technological progress, one based around individual talent and genius, rather than the collective endeavour of humble individuals. He was not the originator of this narrative; indeed, he was building on the previous claims of inventors like Samuel Morse and Alexander Graham Bell that they deserved full credit for their inventions.[27] Moreover, in deliberately stage-managing his demonstrations as dramatic public spectacles, Marconi was similarly drawing on a long-standing tradition of public scientific spectacles going back at least to the seventeenth century.[28] As Iwan Rhys Morris has shown, however, there was something particularly spectacular about electrical demonstrations.[29] Until its demystification in the twentieth century, electricity, with its invisible and intangible properties, possessed a particular sense of magic which enthralled public audiences. As Morus has demonstrated, there had existed a vibrant culture of popular scientific lectures and displays involving electricity going back to the early nineteenth century in Britain. Indeed, he juxtaposes this tradition of electrical exhibitions, pioneered by skilled artisans and instrument makers, against what he identifies as elite science - represented by august scientific bodies like the Royal Society and the British Association.[30] These institutions, he argues, tended to reject overt popular display as damaging to the public reputation of men of science.[31] As Morus has written, it is right to see the 'telegraph engineers…of the late Victorian age' including Marconi as 'in many ways direct inheritors' of the earlier tradition of electrical display, cultivated by the skilled craftsmen of London.[32]

In the summer of 1899, Marconi seems to have captured the imagination of substantial sections of the British press, many newspapers enthusiastically aiding his self-fashioning as a 'great' inventor. For the writer of an article in the *North-Eastern Daily Gazette*, published on Saturday 19 August 1899, the demonstration of Marconi's wireless

telegraphy was 'the most sensational event' to be witnessed at the BAAS meeting. 'Signor Marconi', he wrote, 'attended the British Association meeting at Bristol last year, but it was not his fortune to get the opportunity he no doubt wished to exhibit and explain his invention.' 'There will be no lack of opportunity at the Dover meeting', he assured his readers, praising Marconi's invention as the 'greatest sensation of the century'.[33] The *British Architect* was similarly fulsome in its praise of Marconi. While stating categorically that his system of wireless telegraphy would 'be the most interesting scientific accomplishment' on display, it dedicated much of the piece to arguing that Marconi may soon be successful in transmitting wireless messages across the Atlantic.[34] This sort of speculation offers a good example of the way in which Marconi successfully caught the imaginations of those who reported on and read about his exploits - groups which included many with little or no first-hand experience of wireless telegraphy. As David E. Nye has shown, what he terms 'sublime experiences', or 'repeated experiences of awe and wonder,' were often deliberately cultivated by inventors in the late nineteenth century to help 'validate new social and technological conditions.'[35] Generating emotional and aesthetic responses in audiences provided an alternative means for inventors to build their reputations and convince the public of the significance of their inventions, particularly when, like Marconi, they found it difficult to gain access to established scientific circles.

In interviews which Marconi gave to journalists in person at Dover before leaving for the United States, he placed the BAAS and the British scientific world, more generally, firmly in the role of audience. In so doing, he presented an alternative theory of technological progress and innovation, built around the figure of the 'great man.' Yet, Marconi not only offered his own version of the past development of wireless telegraphy; he also constructed imagined technological futures, which placed him firmly in the centre of the action as a man of powerful genius. According to one journalist at Dover, 'Signor Marconi had been speaking

about the effect produced in the scientific world when he succeeded in transmitting messages across the English Channel…, and wondered if it would create much surprise if he succeeded in sending a message from England to America. "It is a very long distance," he remarked. "I do not say it will be done yet, but many things which seemed impossible have been accomplished."'[36] Here, we see Marconi proceeding from actual to imagined uses of his technology in order to engage as large an audience as possible. A different account of the same interview with Marconi which appeared in *The Standard* on 21 August 1899, mentioned the Dover meeting only as the site where 'French and English scientific visitors are to have the opportunity of witnessing the success which this new telegraphy is capable of achieving.'[37] Here again, the emphasis was as much on the imagined or possible success of the technology as on its actual uses in the present. On Saturday 26 August, the sole illustration in an article referring to the upcoming BAAS meeting was an image of Marconi with his wireless coherer. Both in text and in image, Marconi's 'great man' narrative was achieving considerable impact in the public press.[38]

Marconi's claims about the possible future uses of his technology were more readily believed because, in the minds of many contemporaries, he had already achieved the successful transformation of wireless telegraphy, as one writer in *The Outlook* put it, 'from a mere laboratory experiment' into a 'work-a-day fact.' His apparent track record in converting imagined into actual use played an important role in building Marconi's confidence and reputation. As the same writer described it, the BAAS gathering at Dover was to be 'shorn…of half its lustre by the unavoidable absence of Signor Marconi in America.'[39] After lauding his invention and his own talent in numerous interviews before departing by ship for the USA, Marconi succeeded in raising considerable expectations both about the demonstrations of his wireless telegraphy at the Dover meeting and his own future achievements. His absence at the meeting only added to those expectations, the assembled

crowds being left to imagine what great things Marconi had left Britain for America to pursue. Marconi's apparent victory over the seemingly self-enclosed, elite club of British science appealed to an anti-aristocratic vein in the popular press which had taken offence at the decision of the BAAS's General Council to push ahead with the Dover meeting despite the high tide of feeling in the wake of the Dreyfus affair. One article in the *Nottinghamshire Guardian* which poked fun at the high moral manliness of the BAAS sarcastically described its members as 'liv[ing] on a plane beyond the influence of the passions and prejudices which move ordinary mortals.'[40] In these accounts, Marconi is represented as both a 'great man' and a 'man of the people', a powerful combination, while the British scientific elite appear out of touch and effete.

In addition to giving interviews and releasing press statements, Marconi's strategic use of the media included the publication of articles written by himself. Most important here, was a piece he wrote for the *Fortnightly Review* entitled 'The Practicability of Wireless Telegraphy' which was published in June 1902 - almost three years after the Dover meeting.[41] In this lengthy piece, we witness Marconi first hand constructing the 'great man' theory of invention. More importantly, for the purposes of this special issue, we see him appealing directly to the imaginations of a series of carefully chosen audiences in order to do this. He begins with the leading men of British science. He tells readers how he welcomed no less a figure than Lord Kelvin to view his system of wireless telegraphy at 'my Alum Bay station.'[42] Marconi's frequent use of 'my' served to assert his exclusive claim to ownership of his technology.[43] While Lord Kelvin was one of the most well-respected men of science in Britain, in Marconi's narrative, he plays the role merely of an illustrious bystander, an intellectually authoritative audience to boost Marconi's own scientific credibility. 'Lord Kelvin', Marconi reported, 'was so much pleased with what he saw.'

As part of carefully prepared and stage-managed proceedings,

Lord Kelvin then sent the 'first paid message by etheric wave telegraphy' to Magnus Maclean, a Lecturer in Electricity at Glasgow University, before sending others to prominent physicists, Sir George Stokes, in Cambridge, and Lord Rayleigh in London, both leading figures in the British Association.[44] Appealing once more to a vision of an imagined future, of which he himself was the chief architect, Marconi described himself as being 'in command of a great force, by means of which stupendous results can be produced for the benefit of mankind.' It is this language of practical application which brings far more people into his story – and makes the BAAS appear insular and small, by comparison. 'Great man' theory, as constructed by Marconi did not exclude marginal groups from the narrative; they were very much present, necessary even, but disempowered, denied anything other than the passive agency of an enthusiastic audience.[45]

Having described himself impressing leading figures of British science with his future vision of wireless telegraphy, Marconi does the same with the British royal family. He describes himself transmitting messages from aboard the royal yacht, containing the Prince of Wales with an injured knee, back to Queen Victoria at Osborne House who was keen to receive updates on the health of her son. 'The instruments on the yacht', he recorded, 'were operated and observed with great interest by the various distinguished persons aboard, notably the Duke of York, the Princess Louise, and the Prince of Wales himself.'[46] Following this, Marconi appears in the role of lecturer, addressing the Institute of Electrical Engineers with his claims about the potential of his system of wireless telegraphy. His lecture, we are told, 'awakened great interest' among 'the public' at large, who 'began to see the practical uses to which the system might be put.'[47] Once more, it is Marconi's use of the conditional tense here which should be noted. He is marketing his technology and himself as an inventor, not on the results which have actually been achieved but by potential future practical uses, not as yet proven. By reducing both leading figures of Britain's scientific

community and prominent electrical engineers to the position of receptive audience, Marconi succeeded (perhaps uniquely) in transcending the argument between the so-called 'theoretical' and 'practical' men, a rupture which had remained open since the early 1880s and grown increasingly wide in recent years.

Later on in his article, Marconi shifts from a national to an imperial stage. Having referred to the great 'interest' in his invention shown by the 'American people' during his stay in New York, Marconi tells his readers how he had to abandon trials of his system conducted with the US navy to respond to an 'imperative' call from Britain. Struggling in their conflict with the South African Boers, Marconi relates how he was summoned to help rescue the situation with his wireless telegraphy. Only at the end of his article, discussed as part of a section entitled merely 'Further Proofs of Practicability', does Marconi actually mention the demonstrations carried out at the Dover meeting in 1899 which are described simply as the exhibition of 'my system…before the English and French bodies.' More than this, he tried to position himself, just as Fleming had attempted during his lecture at Dover, within a self-constructed 'great man' theory of the development of wireless telegraphy as the successor to Volta. The demonstrations, he wrote, were carried out '[o]n the centenary of the day when Volta's great discovery of the electric current became known to the world.'[48] In the space of one article, then, Marconi succeeds not only in rewriting the history of wireless telegraphy, but also in offering an alternative paradigm for scientific and technological development: the great man whose talents transcend academic, national and even imperial boundaries.

The reassertion of scientific collectivism and internationalism

Several prominent members of the BAAS, including Oliver Lodge, Silvanus Thompson and Francis FitzGerald, condemned what they saw as Marconi's self-aggrandizing style. Moreover, in the years following the meeting at Dover, the Marconi company asserted their exclusive ownership over wireless telegraphy. They enforced what has been termed the doctrine of non-intercommunication, meaning that Marconi receiving stations refused to communicate wirelessly with systems employing equipment produced by the company's rivals.[49] Oliver Lodge, who may be taken as representing the prevailing view among BAAS members, attacked Marconi for the extent to which he appeared to exploit his invention for private profit. While entitled to a fair share of credit and profit for his invention, Lodge told readers in a letter to the *Times* in 1906 that Marconi was 'not entitled to a monopoly.' 'It would not only be unjust,' he continued, 'it would be in high degree foolish to allow a monopoly…to arise in connexion with this application of world-wide science.'[50]

So much of the rhetorical power of Marconi's publicity strategy derived from his claims to innovation and novelty. Imagined use is only powerful as a marketing device and tool of self-promotion if the potential applications being described have not been 'sold' to an audience already. Yet, both journalists and prominent figures within British science warned that Marconi's wireless telegraphy was not as novel as he claimed. One writer in the *Outlook* concluded that the Dover meeting had 'been of…interest and value, not in the way of new discoveries so much as in that of explanation and getting the perspective of laws and properties already known.' Here, he was referring to the basic principles of Marconi's system of wireless telegraphy, specifically, 'that certain gases, and even tubes filled with finely-powdered metals [such as Marconi's receiving instrument comprised], would act as conductors…had long been known.'[51]

Another article which appeared on 25 November 1899 in *Chambers's Journal* roundly criticized newspapers and journals for treating Marconi's

demonstrations at Dover in such a 'sensational' manner, effectively pandering to the inventor's ambitions. 'There was,' the writer maintained, 'absolutely nothing new introduced, and the experiments were, as usual, confined to the Channel.' In particular, he took issue with Marconi's claim that his system of wireless telegraphy would render cable telegraphy redundant. '[I]t is difficult to get the newspaper-reading public to understand', he wrote, 'that there is all the difference in the world between pre-arranged experiments, specially laid out for success, and ordinary everyday practical working.' Here he is describing the gap between actual use ('pre-arranged experiments') and imagined use ('ordinary everyday practical working') which has not yet been achieved. While 'people [in Britain]…have gone wild over wireless telegraphy', he declared, 'the Americans have taken the matter more philosophically.'[52] By challenging the novelty and originality of Marconi's invention, these kinds of criticism sought to reduce his appeal to the popular imagination and to reassert the primacy of actual achieved results.

In the same way, writers critical of Marconi sought to debunk his newly proffered narrative of technological progress as the product of individual genius. Another article in *Chambers's Journal*, this time from November 1899 endorsed the claim made by the prominent physicist, Silvanus Thompson, that it would be wrong to describe Marconi's wireless telegraphy as innovative or new. Moreover, the writer of the article put forward his own alternative account of the progress of wireless telegraphy, which, he interpreted as a collaborative effort among many individual scientists. While Marconi is mentioned as part of this collective endeavour, it is only after many other, more significant, individuals have been discussed – men with more solidly scientific reputations – such as Oliver Lodge and Francis FitzGerald.[53] In addition to including a much longer list of names, the article locates the origins of wireless telegraphy much further back in time. 'Oddly enough', its writer mused, 'the idea of this so-called 'new' telegraphy is a very old one. So long ago as 1842 Morse, the

great American telegraph inventor, worked at the subject, and made experiments on the Susquehanna River, about a mile wide.'[54] In addition, he discussed at length the contributions of W.H. Preece and Oliver Lodge.[55]

Only after the work of these other individuals has been justly acknowledged is Marconi brought into the narrative; moreover, the treatment he receives at the hands of the article's author is by no means favourable. In the first place, he is depicted as something of an upstart parvenu, dependent upon the good will of British men of science and the British government. His foreign background is then discussed at some length with the reader being left in no doubt that he is not a man of established scientific reputation in Britain. Nor does the article simply cast Marconi in a smaller and less significant role in the story of the development of wireless telegraphy; it seeks deliberately to undermine, if not to refute, the claims he made for the future (imagined) uses of his technology. To this effect, the article cites the opinion of Silvanus Thompson that telegraphy completely without wires, such as Marconi claims to have invented, is in reality impossible. 'One thing is certain, however,' he is quoted as saying, '-there is no such thing as 'telegraphing without wires;' and it is equally certain that the base-line, or base-area, surrounded by wires, is a fundamental necessity.'[56] The voice of an established and respected academic scientist like Silvanus Thompson, stressing 'facts' and 'realities', rather than 'possibilities' is here drawn upon to counter Marconi's visionary language and appeal to the imagination.

The criticisms presented in these newspapers and journals reflected the broad attitude of British men of science towards Marconi and his strategies of self-promotion. In spite of the considerable public attention aroused by the demonstrations of his wireless system at Dover, the BAAS's official report of the meeting barely mentioned them and did not refer to Marconi by name. What is more, in the annual report for 1890, Marconi was attacked for creating a 'sensation at Dover' which 'distracted attention from the more

practical and older method' of wireless telegraphy pioneered by Oliver Lodge.[57] This interpretation of Marconi's role at Dover was reinforced by Lodge himself much later in his 1931 book, *Advancing Science*, published to celebrate the centenary of the BAAS. The 'feature' of the Dover meeting, he wrote, and which ensured he would always remember the gathering, was not Marconi but rather J.J. Thompson's discovery of the electron. Significantly, Lodge described Thompson's discovery, in sharp contrast to Marconi's preferred mode of self-presentation, as a contribution to the collective work of science, whose greatness lay in its potential to benefit mankind and to open up new avenues of research for fellow researchers.[58]

The way in which Marconi responded to the backlash he received from prominent British scientists like Lodge is interesting in an essay focused on the category of 'imagined use'. Marconi emphasised the reality of his achievements with wireless telegraphy. Similar to the praise we cited earlier from J. Ambrose Fleming's lecture at the Dover meeting, when he lauded Marconi for translating wireless telegraphy successfully from delicate laboratory experiments into tangible fact, Marconi stressed the practical, achieved uses of his technology. It was, he claimed, his scientific critics – Lodge and other electrical researchers - who had failed to apply for patents or to exploit their findings commercially. These were the men Marconi denounced as mere 'theoreticians' whose contribution to the development of wireless telegraphy remained firmly in the realm of the imagination. Citing an article in the *Scientific American*, Marconi declared that although there had been several 'mere theoretical discoveries' before his own work, it was he alone who future generations would recognize and honour as the individual who translated theory into practice. 'Whatever may be the merits of this controversy', the *Scientific American w*rote of Marconi,

> we are satisfied that it would be as easy to sweep back the tide with a broom as to prevent the system of telegraphy which has just done such good work off New York

> Harbour and with the English Fleet from becoming forever identified with the name of the man who first brought wireless telegraphy to a practical and useful consummation.[59]

Conclusion

By drawing this line between theory and practice, Marconi made use of rhetorically gendered categories current in British scientific culture in the 1880s and 1890s. Before Heinrich Hertz practically demonstrated the existence of electromagnetic waves in 1888, British followers of Clerk Maxwell's mathematical theory which had predicted the presence of such waves, had been frequently belittled, especially by practical electrical engineers, as 'working out a mere paper theory.' Preece himself had been particularly dismissive of their significance, declaring 'stern experience' to be 'the best of all teachers – superior to all the theory in the universe.'[60] 'Practical men' like himself should not bow to those he termed 'slaves of mathematics' who relied on 'mere mathematical development' for their conclusions.[61] Other self-identifying 'practical men' who entered the fray in these years included the electrical engineer, S.A. Varley, who dismissed theoretical developments like the Poynting flux as 'curiously complex' and the products of effeminate 'flights of fancy' and 'luxuriance of imagination' in the minds of theoretical scientists who should spend less time in their ivory towers and more in the real world.[62] The conflict between these two models of scientific masculinity came to something of a head in 1888 following Hertz's discovery of electromagnetic waves. In a report he compiled upon the annual meeting of the BAAS held in Bath that year, Oliver Lodge cited an editorial in the *Engineer* which claimed that, despite Hertz's discovery, 'the world owes next to nothing to the man of pure science…[T]he engineer, and the engineer alone, is the great civilizer. The man of science follows in his train.'[63] It was this discourse,

still unresolved ten years later, which Marconi was again picking up in his response to his detractors like Lodge who claimed that he was stealing credit for others' ideas.

In reality, though, this distinction between theory and practice, although an important part of the gendered rhetoric of British science in these years, is fundamentally unhelpful for historians of gender. Indeed, it provides something of a false target for their analysis. Marconi's significance in this field is as a pioneer of an alternative model of scientific masculinity - the great living inventor - which he not only popularized but inscribed in a rival narrative of the history of wireless telegraphy. Marconi was arguably the most successful spokesman for the 'great man' paradigm in science at the end of the nineteenth century. By focusing on the talented individual whose achievements were the result of his own genius, he was able to eschew limitations of social background and national identity which had traditionally functioned as arbiters of scientific reputation. His appeal was broad, not limited to established scientific elites, or even to particular countries, and was based as much, if not more, on the imagined uses of his technology than upon actual results.

The Dover meeting of the BAAS in 1899, which has provided the focus for this essay, occupies a relatively unimportant place in the history of both the British Association and Marconi's own career. It does, however, function as a key moment in the development of Marconi's 'great man' theory, a tipping point, where we see an individual, previously excluded from elite science in Britain, surpass in influence and importance those very men whose support just twelve months earlier he had been so keen to win. It marks an important shift in scientific culture within Britain. For the first time, the general public, who were mostly non-users of the technology Marconi was promoting, became the arbiters of scientific reputation and honour. Through strategic use of the media and carefully staged demonstrations, Marconi presented a coherent challenge to the image and ideal of the 'man of science' as a selfless and moral seeker after truth, which had dominated the British

Association and British science more broadly, since the early years of the nineteenth century. It is a mark of the impact which Marconi and other cultivators of the 'great man' paradigm enjoyed, both in their own time and subsequently, that historians of science and technology today are still trying to free themselves from its alluring appeal.

NOTES

[1] Aitken, *Syntony and Spark*, p. 219.
[2] Hugh Aitken wrote that 'For the historian there is, with Marconi's arrival, the feeling of entering into a different world – the world, not of the scientist but of the engineer and the entrepreneur." Aitken, *Syntony and Spark*, p. 26.
[3] Hunt, '"Practice vs. Theory," 341-355. As Bruce J. Hunt has well shown, the world of electrical telegraphy in the late 1880s and 1890s was riven by a deep divide between what he terms the 'theoreticians' and the 'practical men'. The theoreticians were, in general, university-trained professors, advocates of Clerk Maxwell's theory, whose experiments remained largely confined to laboratories rather than being exploited for commercial gain. The practical men, by contrast, were the old guard of electrical engineers, men with little formal training, who had left school early and learned 'on the job'. The relationship of these men with the scientific establishment in the late nineteenth century was sensitive. Their recognised leader was the Post Office's chief electrical engineer, Sir William Preece. Although Preece was an active contributor to the BAAS, he had never pursued the study of electricity theoretically and felt increasingly excluded from the rising generation of theoreticians like Oliver Lodge, George Francis FitzGerald and Silvanus Thompson.
[4] See, for example, *Aberdeen Weekly Journal*, 17 August 1889; *Pall Mall Gazette*, 17 August 1889; *The Standard*, 17 August 1899; *Yorkshire Herald*, 17 August 1899; *Aberdeen Weekly Journal*, 18 August 1899; *The Sheffield and Rotheram Independent*, 18 August 1899; *The North-Eastern Daily Gazette*, 19 August 1899; *Nottinghamshire Guardian*, 19 August 1899; *The Morning Post*, 21 August 1899; *The Standard*, 21 August 1899; *Huddersfield Daily Chronicle*, 22 August 1899; *The Yorkshire Herald*, 22 August 1899; *The Penny Illustrated Paper*, 26 August 1899; *Morning Post*, 12 September 1899; *Sheffield and Rotheram Independent*, 13 September 1899; *Morning Post*, 13 September 1899; *Liverpool Mercury* 22 August 1899; *The Belfast News-Letter*, 14 September 1899; *Glasgow Herald*, 14 September 1899; *Freeman's Journal and Daily Commercial Advertiser*, 14 September 1899; *The Sheffield and Rotheram Independent*, 14 September 1899; *Nottinghamshire Guardian*, 16 September 1899; *Aberdeen Weekly Journal*, 21 September 1899; *The Times*, 18 September 1899; *The Times*, 19 September 1899.
[5] Fleming, "Wireless Telegraphy," 6, cited by Hong, *Wireless*, 56-57.
[6] Rose, *Feminism and Geography*; on 'scientific masculinity', see also Ikonen and Pehkonen, "Explorers in the Arctic," 127-152.
[7] David Livingstone famously spoke before the BAAS in Dublin in 1856 and Bath in 1864; Samuel Baker, another famous African explorer, acted as president of the Geographical Section (E) at the meeting in Dundee in 1867.
[8] See Hong, *Wireless*; Gooday and Bruton, "Marconi the Monopolist?"
[9] One article discussed whether Marconi had an 'ulterior object…in his visit to America.' See *The Morning Post*, 13 September 1899.
[10] See, for example, "Wireless Telegraphy: An Interview with Signor Marconi" *The Morning Post*, 21 August 1899; "Wireless Telegraphy", *Sheffield and Rotheram Independent*, 13 September, 1899.
[11] Hong, *Wireless*, 56.
[12] Gooday and Bruton, "Marconi the Monopolist?," 8-9; Hong, *Wireless*, p. xii.

[13] For a different view, stressing the extent to which British science had begun to act like a profession by the late nineteenth century, see Barton, "'Men of Science'," 73-119.
[14] "Opening Address of the President," 500.
[15] For Bacon's influence upon the BAAS, see Morrell and Thackray, 268-269.
[16] Pancaldi, "Scientific Internationalism," 145-169.
[17] *First Report of the Proceedings*, 10.
[18] Aitken, *Syntony and Spark*, p. 230.
[19] *Freeman's Journal and Daily Commercial Advertiser*, 14 September 1899.
[20] *Aberdeen Weekly Journal*, 21 September 1899.
[21] Sotheby, *Lines Suggested*, 3.
[22] *The Times*, 19 September 1899.
[23] Rutherford, "The Electrical Structure of Matter," 1-24.
[24] *The Bristol Mercury and Daily Post*, 13 September 1898.
[25] *Pall Mall Gazette*, 17 August 1899.
[26] *The Sheffield and Rotheram Independent*, 18 August 1899.
[27] For more on the 'great man' theory of invention, see Moon, *Social Networks in the History of Innovation and Invention*.
[28] See, for example, Bensaude-Vincent and Christine Blondel eds. *Science and Spectacle in the European Enlightenment*.
[29] Morus, *Frankenstein's Children*, 3.
[30] Ibid., xi.
[31] It is important to remember, however, that in the early nineteenth century prominent figures within elite science, men like Humphry Davy and Michael Faraday, did carry out dramatic and carefully staged electrical experiments in front of large audiences, albeit middle and upper-class audiences in fashionable locations like the Royal Institution. On this, see Golinski, "Humphry Davy: The Experimental Self"; Ellis, *Masculinity and Science in Britain, 1831-1918*, especially chapter 2.
[32] Morus, *Frankenstein's Children*, xiii.
[33] *North-Eastern Daily Gazette*, 19 August 1899. For more on the history of technology as spectacle, see Morus, *Frankenstein's Children*; Nye, *American Technological Sublime*.
[34] *British Architect*, 15 September 1899.
[35] Nye, *American Technological Sublime*, xvi-xvii.
[36] "Wireless Telegraphy: Interview with Signor Marconi."
[37] *The Standard*, 21 August 1899.
[38] *The Penny Illustrated Paper*, 26 August 1899.
[39] "At Dover", 196-197.
[40] *Nottinghamshire Guardian*, 16 September 1899.
[41] Marconi, "The Practicability of Wireless Telegraphy," 931-941.
[42] Ibid., 931.
[43] See, for example, Ibid., 931: 'The success of my various trials led me to desire some opportunity of testing the practical application of my system on a more extended scale.'
[44] Ibid., 931.
[45] Ibid., 932.
[46] Ibid., 934.
[47] Ibid., 935.
[48] Ibid., 940.
[49] Gooday and Bruton, "Marconi the Monopolist?," 27.
[50] Lodge, "The Wireless Telegraphy Conference," 10.
[51] "Notes," 229.
[52] "The Month: Science and Arts," 829-831.
[53] "The New Telegraphy," 778.
[54] Ibid., 780.
[55] Ibid., 778.
[56] Ibid., 779.
[57] *Report of the Seventieth Meeting*, 639.
[58] Lodge, 179.
[59] Marconi, "The Practicability of Wireless Telegraphy," 936.
[60] Cited in Baker, *Sir William Preece, F.R.S.,* 107.
[61] "Discussion," 644-645.
[62] Cited in Hunt, '"Practice vs Theory"', 350.

[63] Lodge, "Sketch," *Electrician*, 1888, 622.

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