

Personalities, publics and places in 19th century science popularisation

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The long version of the history of science communication reaches back to pre-industrial times. Through the 19th century, as the figure of ‘scientist’ takes shape, the role of populariser is integrated into it. This paper examines what it meant to do popular science through the stories of some leading exponents of popularisation spanning the 19th century. The personalities are – left to right, above – Humphry Davy and his cousin Edmund Davy, Dionysius Lardner, John Tyndall and Agnes Mary Clerke. These personalities are linked through being born in, or active in, Ireland.

Through their own reflections and through observers’ commentaries on their performances we gain insight into the growing publics for science and into the view these popularisers had of their popular role. From being a theme of fashionable social gatherings popular science evolves into a profitable practice, as demonstrated in Tyndall’s and Lardner’s lecture tours of the United States and in the publishing record of these two and of Clerke, who was a pioneer among women popularisers.

The publics for science changed over time, reflecting the expansion of education and of industry. At the start of the century the public for science came largely from the educated elite for whom “science provided fashionable topics for polite conversation” (Finnegan 2017). Later, public education of artisans, mechanics and operatives in manufacturing industries grew rapidly and “scientific subjects became a form of ‘shop talk’ rather than a topic of interest to a social elite” (ibid.). In the last example, we see a form of popularisation as a service to scientists, reflecting the increasing specialisation, and the need for explanations of current science in one field for those working in another.

Humphry Davy (1778-1829) and his cousin Edmund Davy (1785-1857)

Humphry Davy was already a star in the first decade of the 19th century, attracting big crowds to the Royal Institution and the Royal Society in London for his lectures, producing “sparks, explosions, and unusual odours, all guaranteed to excite the audience” (Kenyon, 2008). “Aristocrats preened and even took turns standing in as Davy’s assistant. He was revered by the audience as a scientific wunderkind.” Davy prepared his performances carefully,

sometimes repeating a passage several times, varying the voice. But to some critics his was a “flamboyant and foppish style”, and he attracted “undue female attention” (Finnegan 2017).

In 1810, Davy was invited to give lectures at the Dublin Society, where the attendances reached up to 400. Davy received a fee of 500 guineas, equivalent to several years’ salary in his post at the Royal Institution. He was invited to give a second series of talks a year later, at an increased fee of 750 pounds.

Edmund Davy (1785-1857) followed his cousin to the Royal Institution, and was appointed in 1813 to a position at the newly established Royal Cork Institution in Ireland. He later moved to the Royal Dublin Society where he became noted, in his public talks, for the “painstaking accuracy of his explanation, and his ever anxious desire to impress his auditory with clear and well-defined ideas ... he never descended to lecture merely for display” (William Barker 1858).

The RDS Theatre (now the home of the Irish parliament) had a capacity of 500 but the attendance at Edmund Davy’s lectures in the 1830s exceeded that number, so the talks were offered twice a day. Davy was strongly committed to pointing out “the applications of science to the useful arts, and to apply it to the common purposes of life.”

Dionysius Lardner (1793-1859)

Dionysius Lardner was educated at Trinity College Dublin. He was married as a student, a father three times over, and separated due to an extramarital affair, all in a period of five years. The Royal Dublin Society invited Lardner in 1826 to give lectures on the steam engine. These were turned into a book published in 1828 and, in that year, Lardner was appointed to a chair of Natural Philosophy and Astronomy at the newly established University College London. He also began work on his ambitious Cabinet Cyclopaedia, a compendium of small books – eventually over 130 of them - on various subjects in history, biography, natural philosophy, natural history and trades. Soon Lardner was earning more from his literary work than from his university and quit his professor’s position.

Lardner late had to quit London too due to his relationship with a married woman. The couple went to Paris, then the United States, where Lardner was known through his books, and the scandal surrounding him. He was described as badly dressed, ill-bred and unattractive but he had enough good contacts to arrange public lectures, starting in New York in November 1841.

Later lectures in New York drew over 1,000 people and the New York Daily Tribune published full reports of his lectures. Over two years, Lardner gave over 100 lectures in 17 US cities and Havana. His topics included the Steam Engine, The Visible Stars, Theory of Colours, Electro-Magnetism, and many more. His total earnings were reported as \$40,000.

Lardner spoke without notes, in order that his talks might be “more animated”. His US lectures were published in two books, including a publisher’s notice that they aimed to retain “the same simplicity of language, perspicuity of reasoning, and felicity of illustration, which rendered the oral discourses so universally acceptable”. The published lectures had reached their 15th edition by 1856.

John Tyndall (1820-1893)

When John Tyndall, born in Ireland, became a professor at the Royal Institution in London, his Christmas lectures drew audiences of over 700. He also lectured extensively at working men's clubs and to audiences of many hundreds, even thousands. His lectures were published in books: 'Heat a Mode of Motion' was republished many times in England, later also in the United States and translated into German, Russian, French, Italian and Hungarian.

Following Lardner's lead, in 1872, he accepted a long-standing invitation to lecture in the United States. To herald his coming, a New York publisher brought out his *Fragments of Science for Unscientific People* whose first printing sold out on the day it was released. Enthusiastic audiences, sometimes more than 1,000, heard Tyndall's illustrated lectures on light. The *New York Daily Tribune* sold a total of 300,000 reprints of their reports on his lectures.

Tyndall's lecture fees totalled just over \$23,000, many multiples of Tyndall's RI professor's salary. But Tyndall donated his net proceeds (\$13,000) to support scholarships in physics at Columbia, Harvard and Pennsylvania universities; these scholarships are still running today.

In an obituary Lord Rayleigh (1896) wrote about Tyndall as public speaker and "the brilliant and often poetic exposition by which his vivid imagination illumined the dry facts of science". But there were also criticisms of Tyndall for his high profile as a populariser; a critic said of him that he "martyred his scientific authority by deservedly winning distinction in the popular field".

Agnes Mary Clerke (1842-1907)

Agnes Mary Clerke was not a practising scientist – not many women were – but she did have offers of a computer position at Greenwich Observatory and of a chair in astronomy at a US women's college, both of which she declined. She "had no liking for speaking in public, nor indeed was she well suited for it", according to her astronomer friend Margaret Huggins. Clerke became famous on the basis of her popular science writing, and she might be seen as one of the first professional science writers.

Her 'Popular History of Astronomy during the 19th Century' was published to great acclaim in 1885. A review in *Nature* described it as a "masterly exposition of the results of modern astronomy" and a "vivid and accurate summary of what has been done". *Popular History* was reprinted and republished in several editions from 1887 to 1902. In that period Clerke also published *The System of the Stars* (1890), *The Herschels and Modern Astronomy* (1895), *Problems in Astrophysics* (1903).

Her popularisation was aimed at and received by practising scientists as well as the science-interested public. Huggins wrote in her appreciation of Clerke that "the progress of science and the growth of its literature during the last quarter of a century has been so enormous, that a new order of worker is imperatively called for ... whose mission is to collect, collate, correlate, and digest the mass of observations and papers ... to prepare material for experts, and at the same time to inform and interest the general public".

However, a writer in *Nature* attacked Clerke's lack of scientific credentials and insisted her role was to "describe fairly and clearly what she sees, without irritating the men who are doing the work by expressing her opinion upon it or suggesting what course they ought to take next". Despite such evident misogyny, Clerke was a founding member of the British Astronomical Association in 1890, and later a member of the Royal Institution and an honorary fellow of the Royal Astronomical Society.

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