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Illuminating Knowledge: The London Mechanics' Institution and the Diorama

John Plunkett

The London Mechanics' Institution, founded in 1823, sought to foster scientific knowledge among operatives. This article demonstrates how it was part of a new educational and technological landscape whereby there were increasing attempts to 'illustrate' knowledge in order to make it accessible and memorable. New scientific and optical devices were used to produce, disseminate, and democratize knowledge. The operatives attending lectures and classes had to be engaged and their attention fostered. It was believed that the march of knowledge did not succeed if it was dryasdust, and there were many forms of illustrated lectures, from diagrams and transparencies to magic lantern shows to live experiments. This article links the London Mechanics' Institution to the advent of other metropolitan institutions like the Diorama and reflects on broader ideas of progressive education and the nature of learning engagement.

In early 1825 a series of lectures on optics was given at the London Mechanics' Institution (LMI) by Charles Partington, an established lecturer on popular science. In his lecture of 11 February he paused his discussion of telescopes, microscopes, and prisms to invite a 'working mechanic' named Francis to address the audience concerning his own research on improvements in spectacle glasses. Francis had created an intricate model of an artificial eye using lenses of different convexity. He demonstrated his model, which had a working retina, in order to show how it could aid identifying the precise lenses needed to correct short- or long-sightedness; he also gave the audience the opportunity to inspect it at close quarters. At the conclusion of Francis's talk, he received 'great applause'. He was also praised by George Birkbeck for his perseverance and ingenuity, conducting his research after his working hours as a shoemaker. Partington concluded the lecture by demonstrating the magic lantern and 'throwing upon the screen a variety of images, some of them of a grotesque and humorous description'.[1]

For me, this vignette is an embodiment of a progressive Birkbeck ethos as it celebrates the anniversary of its founding in 1823. We have the co-creation of knowledge, an acknowledgement that expertise and learning are not confined to an elite. Given the right conditions, untapped creativity and skill could — should — be brought to the fore. I began my lecturing career at Birkbeck when conducting my PhD in my early 20s, teaching seminars in Bloomsbury, with students spanning an age range of 25 to 75 and bringing all their life and professional experience. I am certain that I learnt far more from them than they did from me.

This vignette is also revealing in another way. The LMI sought to foster scientific knowledge among operatives. But new sciences and technologies were also used to produce, disseminate, and democratize knowledge. The operatives attending lectures and classes had to be engaged and their attention fostered. Francis's model and Partington's prisms and magic lantern embody the increasing attempts to 'illustrate' knowledge in order to make it accessible. The march of knowledge would not succeed if it was dryasdust, which was sometimes the complaint. Partington's exhibition of comic and grotesque lantern slides acknowledged the need to be engaged in order to be improved. There were many forms of illustrated lectures, from diagrams to live experiments. Even the *London Mechanics' Register* (1825), a journal produced to give a written summation of the various lectures at the LMI, included an attractive wood engraving on the front page of every issue. Various types of illustrated accompaniments to lectures, from diagrams to live experiments or performance were favoured by the

[1] 'Mr Partington's Fourth Lecture on Optics', *London Mechanics' Register*, 19 February 1825, p. 249.

burgeoning number of scientific and literary societies, mechanics' institutes, Sunday schools, and, later in the century, museums, libraries, schools, and colleges.

George Birkbeck himself gave a number of lectures on optical instruments at the LMI; in November 1825 he gave the first public lecture that demonstrated the use of limelight to illuminate a projecting microscope and magic lantern.[2] Limelight, aka oxyhydrogen light, was created when a mixture of hydrogen and oxygen was lit and used to heat quicklime (calcium oxide). It produced a significantly brighter and sharper quality illumination than the various types of existing oil and gas lamp. A number of figures were working on different applications for limelight in the 1820s and Birkbeck was assisted in his lecture by two such men: John Thomas Cooper, a chemical lecturer at the LMI, and Charles Woodward, another well-known scientist and lecturer. Birkbeck demonstrated several experiments, including a combination of the solar microscope and oxyhydrogen blowpipe:

> The images of the objects, powerfully illuminated, were thrown upon the screen, placed before the apparatus, and the magnitude to which they were enlarged, enabled the spectators to distinguish their most minute parts in the greatest perfection. Specimens of different kinds of wood, such as beech, willow, &c. both branches and roots, were thus exhibited and the variety observable in the beautiful structure of their fibres, was admirably exemplified. This application of the oxy-hydrogen blowpipe is a striking instance of the power of science.[3]

Attendees at this lecture were thus treated to magnified objects projected at great size, an opening up of the beauties of nature thanks to cutting-edge science. Technology, knowledge, and new modes of visuality converged. The ability to project clearer, brighter images using limelight was subsequently taken up by popular science lecturers, who would use it to demonstrate the magic lantern and oxyhydrogen microscope.[4] While limelight was incorporated into theatres, its impact on projection technologies was even more profound. The application of oxyhydrogen light was an important step in enabling the magic lantern to become the accompaniment of choice for public lecturers as the

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[2] On early experiments with limelight and oxyhydrogen blowpipe, see Kentwood D. Wells, 'Fleas the Size of Elephants: The Wonders of the Oxyhydrogen Microscope', *Magic Lantern Gazette*, 29.2–3 (2017), pp. 1–40 <http://www.microscopy-uk.org.uk/mag/artjan18/kw-Magic-Lantern-Gazette.pdf> [accessed 8 August 2024].

[3] 'Dr Birkbeck's Lecture on Telescopes and Microscopes', *London Mechanics' Register*, 26 November 1825, p. 67.

[4] Wells in 'Fleas the Size of Elephants' provides an extensive genealogy of the exhibition of the oxyhydrogen microscope in both Britain and the US.

century wore on.[5] Birkbeck's lecture is one link in the chain connecting nineteenth-century lecturing practices to the current omnipresence of projected presentations.

The popular science lectures by Partington and Birkbeck were a sign of the times. The LMI was far from the only new metropolitan institution in the 1820s using innovative visual technologies to enlighten and enchant. Six weeks before the famous meeting that founded the LMI, the Diorama opened its doors on 29 September 1823 in the fashionable locale of Regent's Park. Run by two French scene painters, Louis Daguerre and Charles-Marie Bouton, who had opened the first Diorama in Paris in 1822, the venture was an immediate success (*Figs 1* and 2).[6] The Diorama enchanted audiences with its grand illusionistic tableaux. Similar effects had been created in theatrical scenery and the Eidophusikon but not on the scale and sophistication of the Diorama. The building had a complicated arrangement of shutters, blinds, pulleys, coloured screens, and skylights, which could be used to control the direction, colour, and volume of light coming onto the illuminated transparency. The effect was to slowly but dramatically transform the scene over a period of fifteen minutes.

Fig. 1: Jean Henry Marlet, *Une présentation du port de Boulogne en diorama* (1824). Courtesy of Bill Douglas Cinema Museum, University of Exeter, EXEBD70023.

[5] During the early 1890s, Birkbeck employed one of the most influential lanternists of this period, T. C. Hepworth, as a lecturer in photography.

[6] On the genesis and working of the diorama, see Richard D. Altick, *The Shows of London* (Belknap Press, 1978), pp. 163–77.

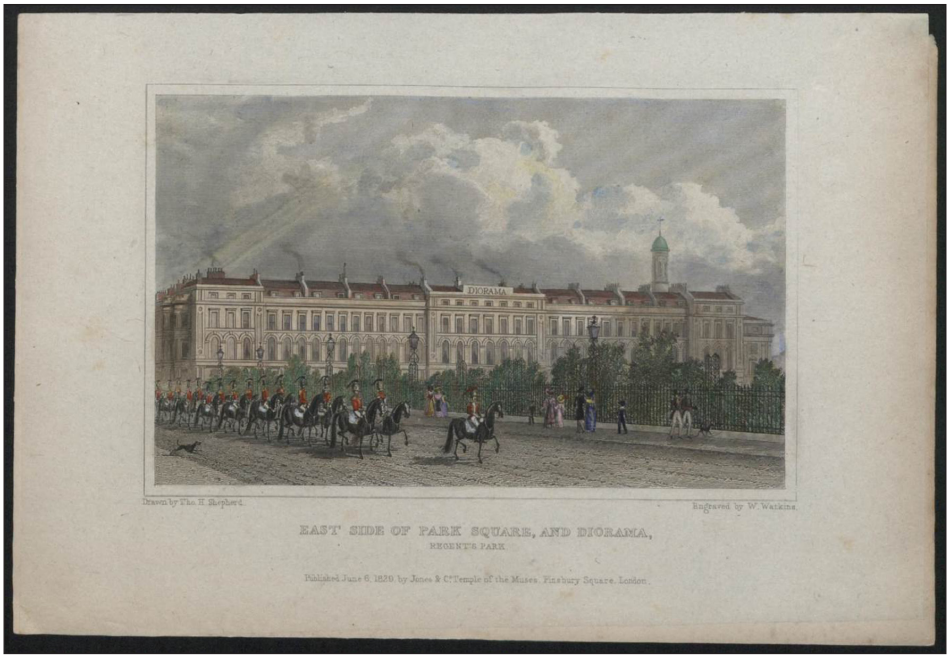

Fig. 2: Engraving by W. Watkins after Thomas H. Shepherd, *East Side of Park Square, and Diorama: Regent's Park* (Jones, 1829). Courtesy of Bill Douglas Cinema Museum, University of Exeter, EXEBD70190.

Diorama shows consisted of two performances. Remarkably, the audience was seated in a revolving saloon that could be mechanically rotated so that it was able to see a second transforming tableau (*Fig. 3*). The paintings themselves were spectacular, measuring seventy-two feet wide by forty feet high; the first paintings depicted were the *Interior of Canterbury Cathedral* and the *Valley of the Sarnen*. The *Morning Advertiser* was typical in waxing lyrical about the illusionistic effect of watching one of the first performances:

> The commodious Amphitheatre from which we contemplated this Picture, then revolving on its own axis, soon transported us to a view of the Valley of Sarnen, in the Canton of Underwald, in Switzerland, and here again, though we were aware that the eye was merely surveying the picture of a beautiful landscape, the mind almost unconsciously imbibed an impression that real earthly Paradise was presented to its contemplation. The beautiful verdure of the trees, extending from the bosom of the valley to the summits of the mountains, in every possible gradation of shade, the cottage in the foreground, which appeared as though the spectator could walk round it, the Lake of Sarnen in the centre of the view, and the lofty mountain of Wildgest-Horn in the distance, covered with snow, all conspired to render the scene

enchanting while the admirable style in which every object was delineated impressed upon the scene the stamp of reality. We cannot avoid noticing the extraordinary effect produced the various modifications of light and shade thrown upon the pictures exhibited on the Diorama, and which, in the vein of the valley of Sarnen, gradually changed the prospect, till what was at first seen in the high glare of sunshine, became obscured in the gloom which almost portended an approaching storm.[7]

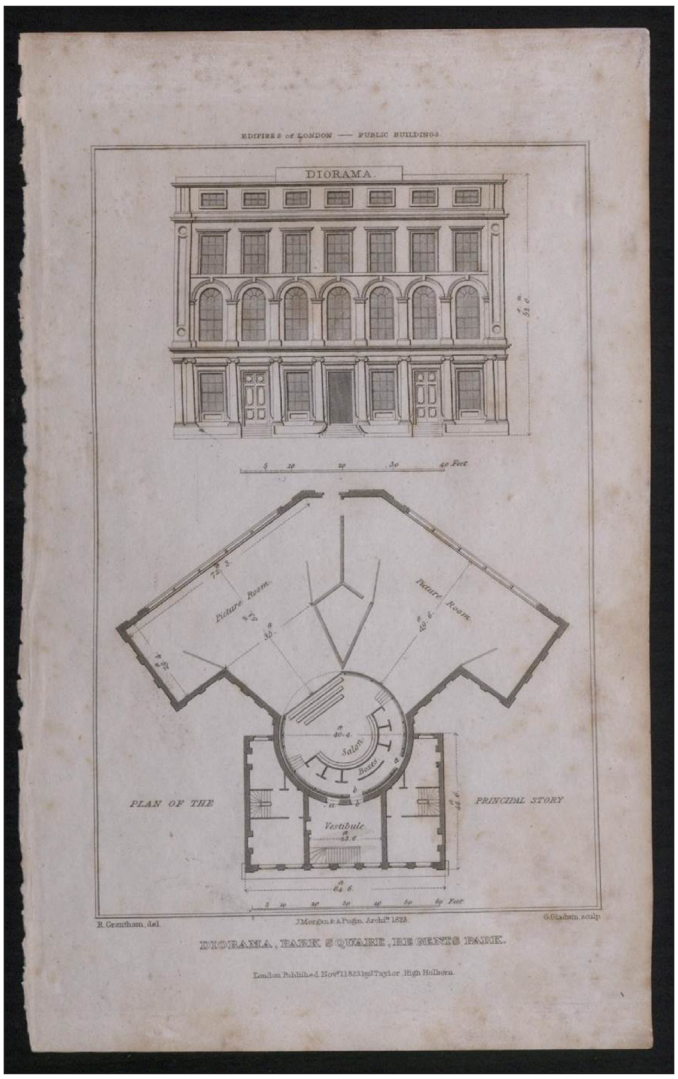

Fig. 3: Elevation and plan of Diorama, Regent's Park, from John Britton and Augustus Pugin, *Illustrations of the Public Buildings of London* (printed for Taylor, Britton, and Pugin, 1825–28). Courtesy of Bill Douglas Cinema Museum, University of Exeter, EXEBD70112.

[7] 'The Diorama', *Morning Advertiser*, 8 October 1823, p. 2.

Admission to Daguerre's Diorama was a pricey two shillings. Even the Royal Academy and Leicester Square panorama only cost a shilling, and these prices were felt to be high enough to ensure the exclusivity of their audience.

The Diorama seems a far cry from the operatives that the LMI was initially intended for. Yet many mechanics' institutes, too, found their audiences never as working class as was initially hoped for and were filled with aspiring members of the middling sort. The Diorama and the LMI are both part of the opening up of art, science, and knowledge to diverse audiences in the 1820s. The Diorama was not the Royal Academy; it was part of the commercial appeal of picturesque and Gothic scenes and the diversification of spaces for art exhibitions. Indeed, the LMI would itself employ Benjamin Haydon — arch-critic of the Royal Academy — as lecturer in art in 1835.[8] The metropolitan exhibition scene was fast changing with institutions like the Society of British Artists, also founded in 1823, and the Regent's Park Colosseum, which opened in 1829 (*Fig. 4*). On the evening when the LMI was founded, audiences could also have visited Marshall's Peristrephic Panorama of the Battles of Les Quatres Bras and Waterloo at the Great Room, Spring Gardens, or a panorama of Corfu at the rotunda in the Strand.[9] The march of popular science was similarly evident in the growth in the Adelaide Gallery, aka the National Gallery of Practical Science, which opened in 1832, and in the Polytechnic Institution in 1838.

Fig. 4: E. T. Parris, engraved by Thomas Higham, *The Colosseum, Regent's Park* (*c.* 1834). Courtesy of Bill Douglas Cinema Museum, University of Exeter, EXEBD70010.

[8] See Joanna Bourke, *Birkbeck: 200 Years of Radical Learning for Working People* (Oxford University Press, 2022), pp. 143–49.

[9] 'Battles of Ligny, Les Quatre Bras and Waterloo', *Morning Advertiser*, 26 November 1823, p. 1; 'Change of Subject', *Morning Chronicle*, 28 November 1823, p. 1.

The diorama is often linked to its eponymous Regent's Park institution, but it would be more productive to think of it as a variegated exhibition mode akin to the oxyhydrogen light and magic lantern. The diorama was an open, protean format that had many usages and different applications. By February 1824 the Theatre Royal, Drury Lane, was advertising a 'diorama' by Clarkson Stanfield that would be exhibited after the pantomime.[10] There was a Grand Revolving Dioramic Panorama of the Defeat of the Turks by Greeks in Dublin in November 1824, supposedly fresh from exhibiting in London.[11] The latest artistic luxury of 1826 was John Heaviside Clark's Portable Diorama that allowed amateur artists to create their own domestic performances.

Illuminated transparencies similar to the diorama were also one of the many ways that lectures could be illustrated, and they were often utilized in lectures at the LMI. When the LMI's new lecture theatre was inaugurated in July 1825, behind the lecturer's table was a 'large frame, six feet square, for the exhibition of transparent diagrams'.[12] In John Wallis's series of lectures on astronomy at the LMI in 1826, he used a number of large transparencies to visualize his points: this included one that was four feet in diameter showing a full moon in all its beautiful detail (*Fig. 5*).[13] Astronomy lectures, at the LMI and elsewhere, often used illuminated transparencies to convey the grandeur of the heavens, but George Birkbeck, too, in a lecture on modern machines, managed to add a dramatic element through an illuminated transparency:

> The Theatre was now darkened, and a magnificent transparency was exhibited, representing the extraordinary boiling fountains in Iceland, which is called the *New Geyser* [*sic*] [...]. Of all these astonishing phenomena of nature the learned Doctor gave an animated and eloquent description, particularly the latter, of which the transparency displayed an accurate and spirited representation.[14]

This portion of the lecture — the darkened theatre, the sublime natural phenomena, the illuminated scene — would not have been out of place in the Diorama itself. New visual formats percolated across different exhibition spaces.

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[10] 'New Theatre Royal', *British Press*, 18 February 1824, p. 1.

[11] 'Now Exhibiting', *Saunders's News-Letter*, 18 November 1824, p. 3.

[12] See 'Dr Birkbeck's First Lecture on the General Principles of Mechanical Science', *London Mechanics' Register*, 6 August 1825, pp. 242–48.

[13] 'Mr Wallis's Third Lecture on Astronomy', *London Mechanics' Register*, 19 April 1826, pp. 2–10; see also other reports on pp. 18–25, 34–42, and 50–55.

[14] 'Dr Birkbeck's First Lecture on Modern Mechanical Inventions', *London Mechanics' Register*, 23 September 1826, p. 349.


No. 85.] SATURDAY, APRIL 29, 1826. [Price 3d.

TELESCOPIC APPEARANCE OF THE MOON.

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Fig. 5: 'Telescopic Appearance of the Moon', *London Mechanics' Journal*, 29 April 1826, p. 1.

Just like mechanics' institutes, there were many provincial iterations of the diorama. Dioramic tableaux that had been exhibited in London and/or Paris, and had outlived their usefulness, were distributed and sold on to a loose network of venues in the largest regional cities. In February 1825 a Diorama opened in Liverpool, with subsequent venues in Manchester, Edinburgh, and Dublin. Tracey May Boyce has demonstrated that these venues were connected through entrepreneurs seeking to capitalize on the success of Regent's Park:

> Struck with their uncommon merit, some English Gentlemen, then in the French Capital, resolved to secure so valuable an acquisition for their own country, and contracted with Messrs. Bouton and Daguerre for the purchase of these two paintings, as well as any of which they might subsequently execute for the Diorama [...]. The unbounded success of the undertaking in London being a guarantee for its meeting

> a similar reception in a few of the leading towns in England, as well as Dublin and Edinburgh, arrangements were entered into with the proprietor, for the purpose of carrying this plan into effect. The vast expense and inconvenience of erecting buildings of such immense size for this exhibition, must preclude its extension beyond a very few places in England. Liverpool and Manchester have been selected as the most proper starting posts for the provincial Diorama.[15]

The Manchester Diorama opened on 19 April 1825, Dublin in March 1826, and Edinburgh in July 1828.[16] The exact connections between the different city sites are unclear, but Boyce has identified the Liverpool and Manchester dioramas as having the same proprietor, and that tableaux certainly moved between them and the two other venues. This network was a short-lived venture, with the Manchester Diorama closing on December 1827; the original proprietors were declared bankrupt soon after. The Dublin and Liverpool dioramas closed in December 1828 and October 1832 respectively, but they were soon replaced by a procession of touring and theatrical dioramas.

The LMI and the Diorama were part of a disparate, inchoate, and exciting moment, a reshaping of the world of improving exhibitions, lectures, and shows. While both Birkbeck and the Diorama in Regent's Park have undergone many changes and reinventions, it is the former that has best endured. Daguerre's Diorama closed in 1853 and was subsequently converted into a Baptist chapel with the interior remodelled: it remained a chapel until 1922. Only aspects remain of the original interior fabric of the Grade I listed building, albeit the beautiful facade survives. Current planning permission, granted in May 2020, is for a major remodelling that would restore the Diorama's original cylindrical saloon in the centre of the building, albeit in the service of expanded and glitzy corporate office space.[17] The echoes and accretions of history continue but there will always be contemporary pressures, educational, financial, and political. For Birkbeck, in 2024, as in the 1820s moment, there are new and diverse audiences to educate; encouraging, perhaps requiring, progressive modes of learning and engagement, but still aspiring towards a shared and egalitarian pursuit of knowledge.

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[15] 'A view, eighty feet by fifty, of the valley of Sarnen in Switzerland: open from ten till dusk', Manchester, John Rylands Library, Pamphlet Collection, R175435, pp. 8–9, cited in Tracey May Boyce, '"Seeing is deceiving": The Lost Manchester Diorama, 1825–7', *Manchester Region History Review*, 1 (2022), pp. 33–46 (p. 35) <https://mcphh.wordpress.com/wp-content/uploads/2022/06/mrhr_ns_1_boyce.pdf> [accessed 8 August 2024].

[16] Boyce, pp. 33–46; on tableaux rotation, see R. Derek Wood, 'The Diorama in Great Britain in the 1820s', *History of Photography*, 17.3 (1993), pp. 284–95 (p. 288), doi: 10.1080/03087298.1993.10442306.

[17] 'The Diorama', Marek Wojciechowski Architects <https://www.mw-a.co.uk/projects/diorama/>; 'Application Documents', Camden <http://camdocs.camden.gov.uk/HPRMWebDrawer/PlanRec?q=recContainer:%222020/0802/P%22> [both accessed 8 August 2024].