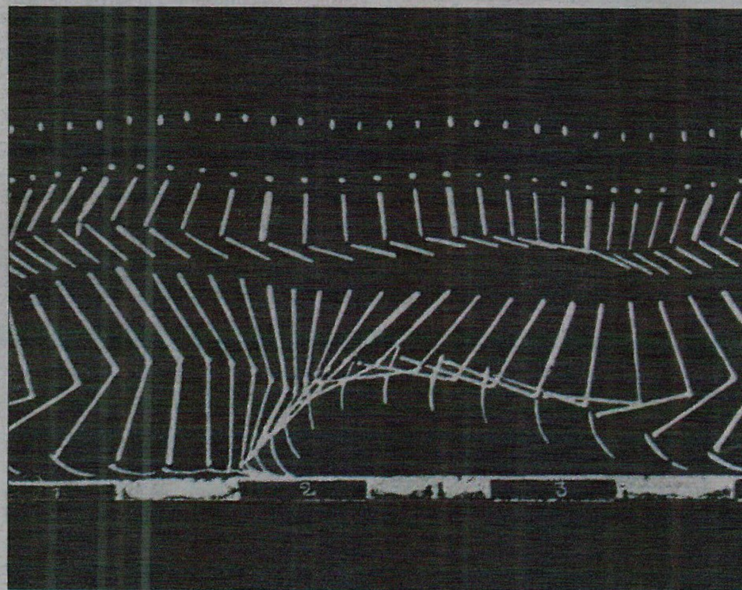
city spaces (many of which, true to the experience of a modern city, juxtapose socio-economic conditions) and the samba itself as a structuring conceit for this visually spontaneous, yet also meticulously researched, documentary. In this respect, Gear positions Welles as a successor to the founders of these techniques – the early filmmakers Dziga Vertov and Walther Ruttmann, with their 1920s City Symphony films. In *Samba*, Welles's vision for the city approaches its most conceptual and original. The flow of crowds and the winding streets hint at the continuation of space beyond the frame: the city represents a challenge to the filmmaker. Welles often accepts that challenge and succeeds in it because his techniques reconcile the spatial and temporal expressionism of the City Symphonies with the gritty realism of the plot-driven, urban noir thriller. See for example, *Touch of Evil*.

In pointing out how Welles's multifocal approach to the spaces of Rio and its carnival "aimed for an expansive reimagining of the city on screen", Gear opens up this line of enquiry. His argument, however, deserves further expansion; instead, Gear returns largely to explaining what happened during Welles's projects and how the director worked through various artistic, financial and logistic obstacles. These details can be valuable, not least when they bring to life Welles's invisible work and unfinished projects; but Gear's book gestures and suggests where it should clarify. It reveals a surprisingly political and internationalist character, who weaved his beliefs about open borders, corruption, pan-Americanism and fascism into visions of the sometimes dark, sometimes utopic, modern city. It leaves unanswered – or unasked, even – certain questions about how this fusion worked. Yet it offers enjoyable revelations for anyone familiar with Welles's work.



"Cinematic analysis of running", 1883, by Étienne-Jules Marey

Mystical abyss

How 'enlightenment is achieved through darkness'

CHRISTOPHER TURNER

Noam M. Elcott

ARTIFICIAL DARKNESS

An obscure history of modern art and media

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In the Festival Theatre in Bayreuth, built in 1876 for Richard Wagner to stage his music dramas, darkness was carefully manufactured and controlled. In earlier theatres, the audience was as much a spectacle as the play, and lighting was balanced so that you could see the dignitaries in attendance as clearly as the performers. But Wagner, with his windowless cathedral, intended the audience to disappear entirely so that spectators would project all their attention to the stage. The orchestra was hidden behind a hood in a pit, referred to as the "mystical abyss", which created a clear division between a blacked-out reality and the ideal world of the artwork. For Noam M. Elcott, in his compelling study of early cinema and avant-garde performance, it was a new mode of seeing to which all the deliberate darknesses of our contemporary cinemas is indebted.

Elcott was a student of Jonathan Crary, the author of the seminal *Techniques of the Observer* (1990), a book that examined how – for René Descartes and John Locke in the seventeenth and eighteenth centuries – the camera obscura was a metaphor for human understanding. In the nineteenth century, however, Goethe inverted this model by studying after-images, emphasizing instead the corporeality of vision. The kaleidoscope, stereoscope and other precinematic devices represented, for Crary, a seismic shift: they weren't the mechanized products of a Renaissance way of seeing, but a rupture in the idea of perspectival space, with its presumed unity in the eye of the viewer. Long before the advent of modernist abstraction, vision no longer belonged to the "real" world, but wholly to the realm of illusion: optics were a creation of the dark recesses of the mind.

In *Artificial Darkness*, Elcott looks in detail at the architecture of this new era of physiological vision, which rendered the world a fragmented, hallucinogenic spectacle. His "obscure history" is both an archaeology of cinema and a brave attempt to find a series of new, architectural metaphors of the *fin-de-siècle* and early twentieth-century mind. In these spaces, blackness was carefully constructed and prioritized over light: "enlightenment was achieved through darkness", he writes, "invisibility was a trap". As Foucault looked in *Discipline and Punish* (1975) to the panopticon, in which a guard was hidden in the darkness of an observation tower as a looming absence or presence (it didn't really matter which), Elcott looks to early theatres and film studios for models of technological shifts in the structures of visual power.

One of these exemplary sites is the "physiological station" or laboratory built in the 1880s in the Bois de Boulogne by the eminent physiologist Étienne-Jules Marey. It was a large shed, with a wide, cave-like aperture. 10 metres deep and lined with black velvet, this dark space looked so abysmal that it appeared on camera as a two-dimensional "black screen". In front of this optical illusion, Marey photographed pelicans, soldiers and horses that flew, marched and galloped across its infinite expanse. Under the harsh light of the midday sun, Marey captured multiple exposures on a single plate to create his blurry science of motion. Sometimes he would dress his subjects in black bodysuits so that he could isolate limbs, or articulate them with white lines so that he could analyse the physiology of movement.

One of Marey's ghostly chronophotographs, taken in 1883 and showing a human skeleton streaking across the frame, is titled "Cinematic analysis of running". Marey was the founding father of cinema, influencing both the Lumière brothers and Thomas Edison. In 1889, Edison visited Marey's station, with its tower and "zenith camera" from which his subjects could be captured from above against a background of a path painted with bitumen. He was struck by Marey's "figures géométriques", and by the new method he was pioneering; capturing movement on a long strip of sensitized paper, rather than a single glass plate. He had shown one of these films, shot at twenty images a second, at the French Academy of Sciences the previous year. When Edison returned to America, he constructed the "Black Maria", a long tunnel-like studio with a skylight and a black screen, built on rails so that it could be rotated to follow the sun.

Elcott prefers the trick, fantasy films of Georges Méliès to the Lumières' realism or Edison's many non-fiction films, which featured subjects such as boxing bouts, vaudeville acts and flamenco dancing. He considers Méliès, who had a background in magic, the true heir to all the invisible technology behind nineteenth-century optical attractions: to the "Black Arts" of trick photography, back projections, spirit photographs, and the phantasmagoric dance of death shown in numerous stage illusions. Méliès, who had attended the Lumières' first public screening, built a special photographic studio, which mirrored the dimensions of the Théâtre Robert-Houdin that he owned in Paris where he performed magic tricks and screened his early films.

These movies, as Elcott shows, were an "ecstasy of dismemberment and darkness". In *The Four Troublesome Heads* (1898), against the backdrop of a black screen and using a black hood, Méliès shoots himself removing his head multiple times, as new ones grow on his shoulders. He lines up these decapitated heads on a table, which he crawls under to highlight the sense of illusion, and they seem to argue and bicker with each other as he does so. *Man with a Rubber Head* (1901) depicts him inflating his head with bellows until it swells to the size of a giant's and explodes; *The Melomaniac* (1903) shows him throwing his head onto telegraph wires, as duplicates sprout. They hang there like notes on a musical staff, forming a chorus that joins him to sing "God Save the King". If Descartes made a distinction between mind and body, new cinematic techniques and staging allowed for a kind of visual schizophrenia, fragmenting the mind into a many-headed Hydra to comic effect.

The black art of Méliès's films prepared the way for the avant-garde, epitomized here by Oskar Schlemmer, whose legendary *Triadic Ballet* (1922) was, for Elcott, "a ballet of darkness". The Bauhaus teacher, choreographer and dancer described the third movement of his ballet as "a mystical fantasy on a black stage". With its black costumes, shown against black sets, it realized Schlemmer's desire to "dematerialize the body". The dancers' black bodysuits rendered their figures invisible, while their costumes transformed their characters into rotund abstractions, as though automata swathed in helmets, extravagant silver springs and disks. "In Schlemmer's dance", Elcott writes, "darkness was not what separated spectators from actors, auditorium from stage, but rather the condition that they shared." With the avant-garde, in comparison to Wagner's careful stagings, the spectator was finally completely fused with the spectacle.

Elcott's account of artificial darkness takes the reader on an intriguing tour into the dark corners of early modernism, even if some of these recesses seem a little impenetrable. The book asks the existential, and perhaps nostalgic, question: "How does one best live in a world of images?" Noam M. Elcott gives few answers, but illuminates instead the shifting sands of technologies of visibility and power. And after so much darkness, one longs for a little colour. It is therefore fascinating to read that the photographic darkroom – where the production of images and their display first met – was originally a riot of colour. The windows were paned in coloured glass – red, orange, green and yellow – that allowed the developer to do his work in a confined space that was only "chemically dark", the negative shielded from actinic light. Similarly, because the darkness of some of the first cinemas was seen as threateningly erotic, moralizers insisted that they were illuminated with the subdued glow of ruby lamps, an alienation effect that perhaps only made them appear even more seedy.