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A neglected genre: James Sibley Watson's avant-garde industrial films

Jan-Christopher Horak

In 1928 James Sibley Watson and Melville Webber produced a short 'amateur' film in Watson's father's stable in Rochester, New York. To visualize Edgar Allen Poe's famous tale, *The Fall of the House of Usher*, they created a dazzling array of superimpositions and distorted images through mirrors, prisms and lenses. Watson stated at the time that neither he nor Webber had read the Poe story in ten or fifteen years, giving them the freedom to re-imagine it rather than slavishly illustrate the work.[1] Soon to become the most widely seen American avant-garde film of the era, *The Fall of the House of Usher* was hailed by the Chairman of the National Board of Review as the most outstanding contribution to the motion picture as an art form since *The Cabinet of Dr. Caligari* (1920).[2] The film was screened both theatrically and non-theatrically hundreds of times all over the United States. The Amateur Cinema League (ACL) bought a 16mm reduction print for its lending library.[3] While beginning pre-production in the spring of 1930 on *Lot in Sodom* (1934), their next major avant-garde work, Watson and Webber also initiated at least three other projects: a narrative short with dialogue, a local newsreel for Rochester, and an 'industrial' for the Bausch & Lomb Company, *The Eyes of Science* (1931). The last-named film would have almost as much of an impact on lovers of cinema as their first, remaining in constant distribution for over a decade. As one writer commented retrospectively: 'Dr. Watson's name, as the producer of *The Fall of The House of Usher* and of *The Eyes of Science,* is outstanding in the entire world of amateur films'.[4]

One may ask, why discuss industrial film within the context of the history of avant-garde cinema? Formalist criticism has, of course, consistently defined film art and aesthetics in opposition to film genres that also serve utilitarian purposes. This splitting of form from content excludes not only industrials and other non-fiction forms from serious discussion, but also constructs false dichotomies. If we return to the avant-garde discourses of the 1920s and 1930s, it becomes abundantly clear that contemporaries of Watson and Webber eschewed distinctions between *l'art pour l'art* and informational/documentary forms. For example, two short films produced by Hans Richter, which long ago entered the avant-garde film canon, *Inflation* (1928) and *Two-Penny Magic* (1929), were initially produced as a credited montage sequence imbedded in a Ufa comedy and an advertising film for a Cologne newspaper. Only decades later were they screened by Richter and other curators as independent avant-garde shorts. As a Dutch Filmliga program noted in reference to Jan Mol's *In the Kingdom of Crystals* (1928): 'The difference between "art film" and "science film," however useful otherwise, is not relevant in this case, as we are as yet unclear about where "art" begins and "science" ends'.[5] While not every industrial can be read as avant-garde, certain industrials at the very least mimic the kind of formal play that has defined the avant-garde, including *The Eyes of Science* and *Highlights and Shadows* (1937), James Sibley Watson's industrial for the Eastman Kodak Company.

As research has continued over the last dec-

Jan-Christopher Horak is Acting Director of the Moving Image Archive at UCLA, having previously directed major film archives in Rochester, Munich and Universal City. He has published widely on avant-garde cinema, including *Film und Foto der zwanziger Jahre* (1979), *Lovers of Cinema* (1995), and *Making Images Move* (1997). Correspondence to: jchorak@ucla.edu

Fig. 1. *Highlights and Shadows* (1937). Directed by James Sibley Watson. [Frame enlargement from 35mm print, Motion Picture Department Collection – George Eastman House.]

ade on early American avant-garde film (as well as on such previously neglected genres as amateur film, documentary, educational and medical film), revisionist historians have ascertained that amateur and avant-garde filmmakers were at the forefront of all progressive and aesthetically ambitious filmmaking, at least in the 1920s and 1930s, and that consequently the borders between genres are not easily drawn. While commercial cinema (i.e. the Hollywood studio system) settled into a mode of production controlled by professionals with relatively rigid normative techniques, conventions and modes of address, other genres developed outside this system and were much more open to unconventional forms and avant-garde initiatives.[6] With the commercial availability of 16mm film after 1923, amateurs also began eagerly experimenting in virtually every genre. One need only look at the 1933 Amateur Cinema League's *Ten Best* list to realise the truth of this assertion: it includes two travelogues (*Century of Progress, Glimpses of Rural Hungary*), two industrials (*Ceramics, Mining Chrome Ore in New Caledonia*), a 'photoplay' (*Pipe Dreams*), a medical film (*Reparative Operation for a Congenital Defect*), an avant-garde film (*Mr. Motorboat's Last Stand*), a nature scenic (*Water*), and an educational *(Design*).[7] Cineastes also moved freely between avant-garde film and other endeavours: documentary, industrials, experimental narrative, film criticism, film exhibition, painting and photography. Watson and Webber, as multi-tasking amateurs/professionals involved in medicine, arts and literary criticism, publishing and museum curatorship, are the standard, rather than the exception. And while a number of scholars have taken up the challenge to write about the connections between avant-garde film and documentary or amateur cinema, much industrial film production, whether involving amateur avant-gardists or professionals, remains *terra incognita*.

In fact, audiences for industrials at one point rivaled any Hollywood film, whether shown theatrically or non-theatrically. Henry Clay Gipson reports the following numbers of screenings per annum for industrials produced by United States Steel: 2,000 (1928), 3,931 (1929), 7,383 (1930), 10,331 (1931), 22,614 (1937), 17,147 (1939) and 6,669 (1945).[8] According to another source, Alcoa Company's theatrical industrial, *Unfinished Rainbow* (1940), was seen by more than 50 million Americans, thus outdrawing *Gone With the Wind* (1939), while a whopping 57 million persons saw Weyerhaeuser's *Green Harvest*.[9] No one knows exactly how many industrials have been produced in the U.S.A.

Industrials, possibly more than most genres, have suffered from 'bad object' status among intellectuals concerned with cinema, primarily because they were simply considered a product of corporate public relations and, therefore, of little interest. Definitions of non-fiction film by Richard Meran Barsam, Erik Barnouw and Jack Ellis include not the briefest mention of industrials, even while giving nods to travelogues and educational films, before moving on to the documentary canon: Flaherty, Vertov, Grierson, Ivens, etc.[10] Whether from a Marxist or an enlightened capitalist perspective, writers assumed *a priori* that the ideological function of industrial and advertising films was to create a favourable social climate for the unfolding of capital's power and the creation of consumers and consumer markets, making them totally uninteresting as either aesthetic or socio-historical objects. From that point of view, industrials seemed to have little to say that one didn't already know. Apart from several 'how to books', often written by practitioners in the field, no critical study of industrials has been published, although Anthony Slide's book on non-theatrical film at least includes a production history of industrial film.[11] Even while the New Historicism in Film Studies began reading other documents of corporate culture against the grain, industrial films have eluded examination. Similarly, social and political historians seemed to neglect industrial films as historical evidence, although makers of historical documentaries

have increasingly turned to industrials for visual evidence and illustration, albeit often without critically highlighting their ideological sources.

No other genre of film has been as sorely neglected by the academic and archival communities, resulting in the destruction of vast quantities of material. Had it not been for a few farsighted individuals, such as Rick Prelinger, even more of the physical history of American industrial film production would have gone missing.[12] Over the past fifty years, major corporations trashed their film archives, as well as their production records or business records with sub-contractors who produced industrials. Within the public film archives, industrials, usually in 16mm, were thought to be either non-archival or 'just' projection prints. While renewed interest in industrials may spur progress, the fact is that at present extremely few surviving industrials have been archivally preserved, entailing new pre-print materials and projection prints. In academia, industrial or informational films were considered propaganda or merely educational, not having the cultural cache of either Hollywood or film art. Non-existent reference works complicated both archival and academic progress in researching industrial film production. Attempting as an archivist to identify film prints of industrials with missing or incomplete credits or, as an academic, to write about a particular producer of industrials, was pioneering work, given the almost total absence of reference works for industrials and other sponsored films. The non-theatrical 16mm educational film catalogues published by Penn State University, Indiana University, and others in the 1960s and 1970s, were among the few sources available, both for actual film materials and filmographic data.

However, the landscape may be changing. The National Film Preservation Board has begun a major project with Rick Prelinger to produce a handbook, *Industrial and Institutional Films: A Field Guide*, which will finally allow historians to get a glimpse of the depth and breath of industrial and sponsored film production, capturing over a thousand titles with descriptors.[13] In conjunction with the announcement of this project, the 'Orphan Film Symposium' in Columbia, South Carolina, focused in March 2006 on industrial and sponsored films. As Donald Crafton noted in his presentation at the symposium, industrials, sponsored and institutional films offer a heretofore unmined field for film scholars, extremely rich in intellectual content. The sheer vastness of the subject, penetrating history, economics, sociology, political science, technology, science, education, media, medicine, intellectual history and aesthetics, guarantees that serious inquiry may yield seismic changes to film and media studies.

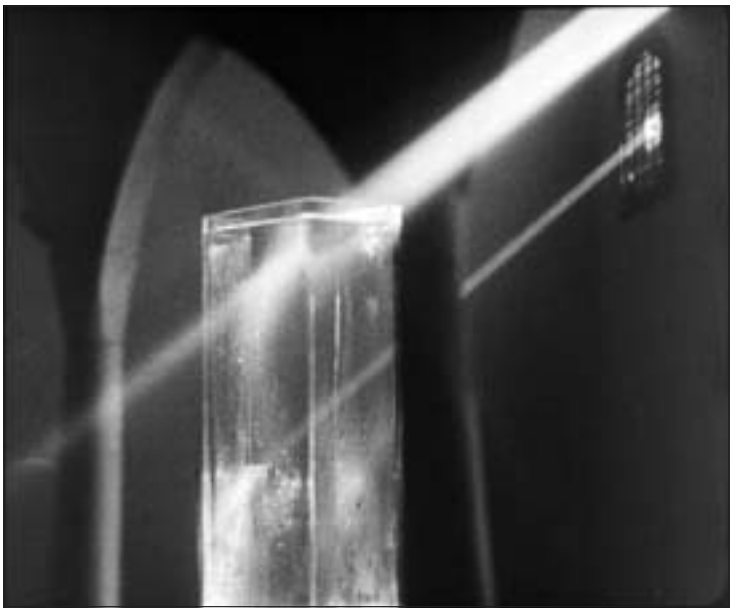

Fig. 2. *The Eyes of Science* (1930). Directed by James Sibley Watson and Melvill Webber.

Fig. 3. *Highlights and Shadows* (1937). Directed by James Sibley Watson.
[Frame enlargements from 35mm print, Motion Picture Department Collection – George Eastman House.]

As a product of culture at a particular moment in time, industrials expose the real and hidden agen-

das of power, the fissures and conflicts within the system that produces them. At another level, the production of desire through industrials was articulated for and addressed to a desiring and consuming public. Industrials reproduce, whether literally or symbolically, the collective imaginary, possibly much more concretely than Hollywood features. One big question that remains, however, is whether industrials utilize a particular aesthetic vocabulary to construct that imaginary. What seems necessary is an archaeology of industrials, in the Foucaultian sense, an exploration of the discursive practices that make up the genre.[14]

As a closer analysis of *The Eyes of Science* and *Highlights and Shadows* will demonstrate, James Sibley Watson brings numerous avant-garde techniques into play while simultaneously constructing a positive vision of corporate America and its industry. These values are communicated through a belief in science and technology as inherently beneficial, in the efficiency of an enlightened corporate technocracy, in the competency of a highly skilled and trained workforce, and in the inherent democracy all the above guarantees average Americans.

Unplumbed possibilities

In a 1931 editorial marking the sixth anniversary of the founding of the Amateur Cinema League, Hiram Percy Maxim characterised the organisation as unlike any other, given that it held no meetings, involved no identifiable markers for its membership, and that most members hardly knew each other. Indeed, only the magazine and the lending library connected the national administration to its 250 local affiliates. Nevertheless, the ACL's identity was clearly defined by its membership, as Maxim noted: 'We amateur cinematographers see ourselves as a growing band of artisans who have been furnished with a new and wonderful tool with unplumbed possibilities'.[15] One of those possibilities for new forms of cinema was clearly the industrial film.

Industrials have been produced since the birth of cinema. Edison's *Blacksmithing Scene* (1893) and *Giant Coal Dumper* (1897), as well as the Lumière brothers' *Forgerons* (Blacksmiths, 1895) can be thought of as surviving early examples of industrial films.[16] As Charles Musser reports, the production of industrial and sponsored films became an important source of income at the turn of the century for the American Mutoscope and Biograph Company: of 653 films made between May 1903 and May 1904, 120 were sponsored by large corporations or the United States government (for example Billy Bitzer shot several films at Westinghouse in 1904). The Selig Polyscope Company produced a series of films for the Armour Meat Packing Co., hoping to counter negative press surrounding Upton Sinclair's novel, *The Jungle*.[17] As early as 1904, International Harvester commissioned a series of industrial films, which they loaned free of charge to small town and itinerant exhibitors, indicating that by the Nickelodeon era industrials were an established genre, especially popular with rural audiences.[18] Demonstrating tractors, harvesters and reapers, the McCormick Company's industrials were also available in 35mm di-acetate, allowing for portable projection in non-theatrical spaces.[19] General Electric entered the field of industrial films in 1907. One of the earliest surviving Pathé Frères films from Russia is an industrial: *Zavod rybnyh konservov v Astrahane* (Astrakhan Fish Cannery, 1908). Shot onsite, the film's editing and its moving camera shots of fishermen, fishwives or cannery employees at work and on break, is extremely sophisticated for the period, giving evidence of a cinema verité technique that would not come into vogue again until after the Revolution with the emergence of Vertov, who made anti-capitalist industrials.

In 1914, Henry Ford founded a motion picture unit which began producing a weekly series, *Ford Animated Weekly* (1914–21).[20] Even before World War I, film producers began to specialize, differentiating production as well as product. In 1910, Jamison Handy founded his industrial film production company, Jam Handy, in Detroit, his first client being National Cash Register; for five decades he was the auto industry's most important film producer.[21] Meanwhile, the Raths-Seavolt Company was founded in St. Paul, Minnesota, another firm that would produce industrials for decades, especially under the Ray-Bell Company brand. The year 1914 also saw the founding of Wilding Picture Productions in Detroit, and two years later, Hugh V. Jamieson formed the Jamieson Film Company in Dallas, which remained in existence until 1972 when it was absorbed by a rival Houston firm.

By the late 1920s, industrial films were a staple in the theatrical and non-theatrical market, but production was still handled largely by professionals utilizing 35mm.[22] The actual quality of these industrials varied greatly, leading Paul Rotha to complain:

'Regrettably enough, where such films have been made, especially of the industrial type, they have most often been regarded by the Trade more as an easy means of making a profit than as an opportunity to develop a new branch of cinema'.[23] Rotha was writing in 1939, but he was a critic and filmmaker who came of age in the late silent period, when among cineastes there was still a firm belief that good cinema occurred in any genre, if the medium's aesthetic parameters were being stretched. At the same time, he agreed with his mentor, John Grierson, and other members of the British documentary school, that the communication of information, i.e. social content, was of primary importance.

Not surprisingly, then, amateurs interested in experimenting with film forms soon gravitated to industrials, especially after 16mm film was introduced by the Eastman Kodak Company. Given the fact that educational institutions, churches, civic groups and amateur film clubs quickly switched from 35mm diacetate projection to 16mm exhibition, it made sense that 16mm would indeed become a 'semi-professional' format for industrials, especially after the introduction of 16mm sound film in 1930 and a sound-on-film projector by Victor Animatograph two years later. The Eastman Teaching Films lending library, distributed by Eastman Kodak to encourage the use of 16mm home projection, included numerous industrials in its late 1920s catalogues. By 1931, according to a source at Eastman Kodak, more than 52 per cent of industrials originated in 16mm, produced by sixty-two industries and 434 companies.[24] The same year saw the founding of the Calvin Company, a Kansas City-based producer of educational and industrial films in 16mm that would soon become one of the leaders in the production of industrials.[25]

By the early 1930s, industrial films were turning up regularly in the pages of *Amateur Movie Makers*, the official publication of the Amateur Cinema League, especially in a regular column by Louis M. Bailey, 'Educational Films'.[26] In a typical column in March 1932, Bailey describes an industrial about the making of ready-to-wear shirts for the D & D Shirt Company in Buffalo, New York; the making of precision lathes for Pratt & Whitney in Hartford, Connecticut; and the production of ice in Watsonville, California.[27] In April 1932, Arthur Gale reports on the screening of *Making Photographic Lenses* (1932), produced by New York City filmmaker George Kirstein at a local cinema club.[28] Meanwhile, reviews of industrials were also appearing in other publications addressing professional and amateur photographers and filmmakers, including *The Camera*.

In February 1932, Epes W. Sargent, writing in *Amateur Movie Makers*, gave film amateurs advice on how to produce industrials that will sell, noting that 'Photographic beauty is a point that wins in many industrials'.[29] One can read the appellation, 'Celluloid that sells', as addressing amateurs who wished to professionalize themselves as producers of industrial films, at least to the extent that they can amortize their production costs. Not surprisingly, then, much of the advice in the article is prescriptive, focusing in its narrative of a reluctant farmer as customer for an automobile both on psychological motivation and descriptions of camera movement; form functions to motivate the viewing subject (i.e. the actual customer/audience) and its imaginary double on the screen to consume the goods offered. Finally, Sargent argues that the product or process of manufacture must be clearly visible to the viewer: 'If the subject is an engine, show it at rest and in motion'.[30]

A later piece in *Amateur Movie Makers*, 'Planning industrial films', by ACL member Cyril Presgrave, discusses both efficiency and aesthetics for industrial films.[31] He first differentiates between three different intended audiences, each requiring a slightly different mode of address, whether company personnel, consumers wishing to educate themselves, or the 'general public', the last named becoming a potential consumer after experiencing the film. Concluding that the 'intra industrial' group will require mostly bare facts, and that the film for the consumer will involve mostly illustrating a product's usage (neither chore being particularly interesting for the filmmaker) the author theorizes a general audience, requiring the most from the filmmaker's technical and aesthetic skills: 'we find the industrial camera developing a new power. In the other types of film, the camera is subordinated and limited to recording plain fact; here, however, the cameraman may use imagination and take advantage of some of the possibilities of his camera.' Presgrave then goes on to suggest the use of close-ups and other cinematic techniques 'to bring the industrial film to life and render it worthy of recognition as a true use of the cinema'. More telling in reference to his formalist film aesthetics, Presgrave develops an elaborate scenario with specific camera directions for a potential industrial on electric refrigerators. Noting that it is constructed 'cinematically', rather than filming professional actors in a 'stage play', the author repeats

Fig. 4. *The Fall of the House of Usher* (1928). Directed by James Sibley Watson and Melville Webber. [Courtesy, J.-C. Horak.]

the charge of contemporary film theorists, like Rudolf Arnheim, that early cinema and much commercial cinema was theatrical. Yet, in apparent contradiction to the formalist argument presented through much of the article, the author also theorizes the ideological value of industrials, characterising them as reflections of American industrial might: 'The United States is a great industrial country; our factories are the most up to date; our social system permits the highest standard of living known.' Indeed, for the dedicated amateur, communicating those statements to a mass audience becomes the pre-eminent goal of industrial film production.

Films like poetry

Born in 1894 to a prominent Rochester family, heir to Hiram Sibley and the Western Union fortune, Dr. James Sibley Watson was a medical doctor who never really practised his profession. He had studied at Harvard, where he met and became a friend of e.e. cummings, later the godfather of his first son. After marrying a Daughter of the American Revolution, Hildegarde Lasell, whose New England blue blood lineage could be traced back to émigré French Hugenots, Watson attended New York University and completed his residency at Bellevue Hospital in 1923.[32] Instead of devoting himself entirely to medicine, J.S. Watson turned some of his energies towards the arts, purchasing and publishing *The Dial* in 1919 with Scofield Thayer, a friend of Hildegarde's from Harvard (and, after 1921, a patient of Sigmund Freud).

First published in 1840 and 1844 by Margaret Fuller and Ralph Waldo Emerson, respectively, *The Dial* had been turned into a modernist literary magazine in 1916 by then editor Martyn Johnston before Thayer and Watson expanded the journal's mandate to include art criticism (by Kenneth Burke, Gilbert Seldes), poetry (Marianne Moore, e.e. cummings, Carl Sandberg) and drawings (Gaston Lachaise, Paul Cézanne). In the 1920s, the journal's contributors constituted a virtual who's who of modernism, Thayer editing from Vienna, while Seldes and Burke functioned as managing editors; Moore assumed the editorship in 1926, Thayer and Watson continuing to subsidize its publication until 1929 when *The Dial* folded. Lisa Cartwright characterises *The Dial*'s high modernist politics in the 1920s as 'marked by the original journal's rhetoric of free speech and aesthetic autonomy, expressed in an adamant separation of aesthetics from politics'.[33]

In 1928, James Sibley Watson, Melville Webber, Marion Gleeson, J.G. Capstaff and others cofounded an amateur cinema group, the Cinema Club of Rochester. Watson had started experimenting with film in 1924–25 while he and Hildegarde lived on a farm near her family homestead in Whitinsville, MA, producing home movies of his children as well as little narrative shorts with family members as actors.[34] He also discussed projects and traded film treatments in his correspondence with e.e. cummings.[35] Born in Boston in 1889, Melville Webber had travelled to Europe in the early 1920s before settling in Rochester, where he became Associate Director of the Memorial Art Gallery and a lecturer in art history at the University of Rochester. While Watson and Webber produced *The Fall of the House of Usher* independently, the Cinema Club's first joint production was *The Luggar* (1929), a more conventional narrative, directed by J.C. Capstaff, the inventor of two-colour Kodachrome and 16mm cameras and projectors at Eastman Kodak. At the same time, club members gathered shots for a possibly uncompleted 'city film', tentatively titled *Rochester – Its Life and Character*.[36]

In February 1929, Symon Gould opened the Film Guild Cinema on 8th Street in New York, screening *The Fall of the House of Usher* in its inaugural programme. Designed by Frederick Kiesler, the Film Guild was, in the eyes of its architect, the 'first 100 per cent cinema in the world'.[37] Numerous dignitaries, including Theodore Dreiser, attended the premiere. As noted above, the film became extremely

popular at ACL meetings, but was also screened at the experimental 'Cine Art' film festival in Marseilles, France in summer 1931. While Melville Webber had suggested the Poe story in November 1926, written the script, and been responsible for sets and costumes, J.S. Watson had directed and operated the camera. Webber and Watson each discussed the film's production in separate articles in *Amateur Movie Maker*, Webber commenting on the use of miniatures for sets and Watson discussing the prisms utilized in the cinematography.[38] It was Watson's goal, he wrote, to 'improve the flow of the picture', rather than merely illustrate a story, 'so as to make the spectator feel not with any particular hero or heroine, as one does in a cheap novel, but to make him feel the whole piece like a piece of poetry'.[39] Watson here equates (Hollywood) audience identification with literary values, hoping instead to communicate directly through images, as does a poet. In keeping with modernist currents, whether from the left (Brecht, Eisenstein), or the right (T.S. Eliot), Watson invokes an anti-psychological, anti-identification rhetoric. He seemingly succeeded. Writing in *The Arts*, C. Adolph Glassgold praised the film as a work of abstract art: 'Aiming to produce a distinct mood, it justly defines the function of its abstract technique as a means to procure that mood'.[40]

Starring non-professional actors, including Hildegarde Watson and Melville Webber as the 'mysterious stranger', *The Fall of the House of Usher* is virtually non-narrative in its re-imagining of Poe's tale. While critics have noted its indebtedness to German Expressionism, it is more radical in its construction of cinematic space; while Expressionism relies on painted sets, seen in medium and long shot to give some sense of an organic space, Watson and Webber's film has few recognisable sets and no recognisable geographic space. It relies, rather, on a dazzling array of often distorted shots, multiple exposures, travelling mattes and animated sequences that allow fragmented glimpses of characters in purely cinematic space. Watson's high key, chiaroscuro lighting reveals and shrouds objects and characters, again giving audiences few visual cues to orient themselves in his spatial construction.

Watson and Webber's second avant-garde film, *Tomatoes Another Day* (1930), on the other hand, is a unique example of Dadaist aesthetics in early sound cinema: a minimalist and virtually expressionless acting style is implemented on a claustrophobic set, the overtly melodramatic love triangle held in long takes and medium shots to accentuate the narrative's theatrical space. A husband surprises his wife *in flagranti* with her lover and shoots him. The actors verbalize their every action, ironically commenting on the over-verbalization of early sound films and on the inane plots of post-silent era Hollywood productions. The Dadaist clash of low art melodrama and highly stylized, statically expressionist body language was possibly too modernist and satirical for Watson's own taste; he considered the film a failure and suppressed its existence, until it was recently discovered in the nitrate holdings of the estate.[41]

Fig. 5. *The Eyes of Science* (1930). Directed by James Sibley Watson and Melville Webber. [Frame enlargement from 35mm print, Motion Picture Department Collection – George Eastman House.]

Collaborating again with Melville Webber, Watson shot *Lot in Sodom* in his Prince Street stable/studio between late 1930 and early 1932, utilizing a home-made optical printer, and working on editing and scoring well into 1933.[42] The film premiered at the Little Carnegie Theatre in New York on 25 December 1933, along with Josef Berne's *Dawn to Dawn*. *Lot in Sodom* ran for more than two months in New York, and continued to play in theatres throughout the 1930s and 1940s, becoming in the process probably the most commercially successful avant-garde film of the era. *Amateur Movie Makers* listed it as one of the 'Ten Best' films of the year. Herman Weinberg wrote ecstatically about the film: 'I have never seen light manipulated so eloquently as in these expressive lights and shadows which sometime form men or fragments of a body, sometimes coagulate into flowers or break up their particles into water…'. Marianne Moore also reviewed the film in the same issue of *Close-Up*, calling it the best art film she had ever seen.[43] While ostensibly a narrative of the biblical epic of Lot and his wife who is turned into a pillar of salt while fleeing Sodom, the film is much more

concerned with non-narrative elements: the play of light and shadow, the balletic movement of bodies, the use of multiple exposures and optical tricks, and the poetic utilization of visual symbolism. The film's imagery is also highly erotic, especially in the scenes where Lot offers his daughter to the angel, and homoerotic, particularly in its light-play on semi-nude bodies of numerous young men. Working without dialogue and with sparse titles superimposed in English and Latin, the film features an atonal music track which underscores the film's modernist construction. Watson would similarly employ avant-garde film techniques and music in the production of his two industrials.

Technology on parade

Just as it is extremely difficult to document the production of most industrials, given the loss of primary documents, so too is it impossible to find details about the production of *The Eyes of Science* and *Highlights and Shadows*. Apart from the credits available on the film (and in the case of *The Eyes of Science*, there are no credits other than the film's title), no documents pertaining to these productions seem to survive. Neither the corporate archives of Bausch & Lomb, nor those of Eastman Kodak, revealed any information about the making of these industrials. The papers of James Sibley Watson, now housed at the New York Public Library, also contained no clues about the genesis of these two projects. Given Watson's financial situation and status as an amateur, one can, of course, assume that Watson was not paid for producing these 'sponsored' industrials. It is also even likely that as a prominent Rochesterian, probably interested in supporting the city's two biggest industries/employers, Watson may have actually financed some of the production, while Bausch & Lomb opened up its facilities, cooperated with the production and retained copyright. The fact that *Eyes of Science* utilizes only public domain classical music supports this theory. In the case of the feature length *Highlights and Shadows*, Eastman Kodak probably donated film stock and developing services, as well as supporting the production with company personnel. However, given the total lack of supporting evidence, any theories in this regard are pure speculation.

We do know from the copyright notice on the film's head title that *The Eyes of Science* was completed in 1930 and from the end title that it was produced 'in collaboration with the scientists and technicians at Bausch & Lomb'. Since the original camera negative is 35mm, this amateur industrial was apparently not shot in 16mm, although 16mm reduction prints were made for the Amateur Cinema League's library. The first public notice of the film appeared in May 1931 in *Amateur Movie Makers*, crediting both James Sibley Watson and Melville Webber as the producers of 'an amateur educational industrial', and stating that it should be of special value to the science divisions of educational institutions.[44] More importantly, the film was chosen as one of 'The Ten Best' amateur productions of 1931 by the staff of *Amateur Movie Makers*.[45] Almost immediately, the film became a popular item on the amateur cinema club circuit. For example, as early as December 1931, Carl Louis Gregory lectured on lenses and light at the Metropolitan Motion Picture Club in New York City, screening *The Eyes of Science* with his lecture, while a similar lecture/film by George Rhode was held at the University of Southern California the same month.[46] Eight years later, the film was still being screened: The Philadelphia Cinema Club reported showing the film in January 1939, along with a lecture by G.C. Crebbin of the Bausch & Lomb Company.[47]

The Eyes of Science ostensibly visualizes the production of optical lenses for microscopes and other scientific instruments, yet its opening shot through a bell jar, distorting the scientist behind it, recalls *The Cabinet of Dr. Caligari* and presages *Frankenstein* (which opened months after this film) rather than a standard, well-lighted industrial; this impression is increased through high key lighting on the scientists and their laboratory instruments, while the background remains shrouded in darkness, a stylistic device also much in evidence in *Fall of the House of Usher*. The next shot superimposes a close-up of a human eye and a microscope, as an invisible speaker lectures about the expansion of human vision through optics. The trope of the camera eye is, of course, a central metaphor of the film avant-garde in the 1920s, utilized by Dziga Vertov, László Moholy-Nagy and many others.

In the first sequence, then, the film demonstrates the physical properties of light rays as they are broken or bent by glass prisms and lenses. Many of these images, while clearly illustrating the narration on the sound track, may also be read as abstract plays of light and shadow recalling similar European and American film experiments, including Watson's own *Lot in Sodom*, Francis Bruguière's abstract light

play, *Light Rhythms* (1930), and precursing Mary Ellen Bute's *Rhythm in Light* (1934) – the latter film benefiting from the assistance of Melville Webber.[48] The following slow pan across a motion picture camera, coming to rest on a lens which fills the frame, could have been lifted from Vertov's *Chelovek s kinoapparatom* (*The Man with the Movie Camera*, 1929), which Watson and Webber would have more than likely seen.

The next sequence visualizes the production of glass lenses and prisms from the melting of raw materials to the grinding and polishing by hand of individual lenses. With evenly lit medium and long shots, the sequence conforms closely to the conventions of documentary filmmaking; yet in the following section, which demonstrates the mechanized grinding of lenses, Watson rhythmically cuts the sequence to music, editing shots on form and movement in a manner similar to the industrial machine sequences in Walter Ruttmann's *Berlin, die Symphonie der Großstadt* (Berlin, Symphony of a City, 1927) or the above-mentioned Vertov film. In illustrating the precision tooling of metal parts holding a lens in place, Watson transitions from straight cuts to a series of dissolves on movement and form, again in homage to the above films.

The final sequence in *The Eyes of Science* discusses the beneficial usages of microscopes and other optical instruments in engineering, medicine and biology. In particular, the microscopic images of typhoid bacilli, chicken fetuses, blood streaming through veins and white blood cells attacking bacteria, recall in their abstract quality the scientific microscope films of Jan Cornelis Mol and Jean Painlevé, which were much appreciated by the European avant-garde.[49] The sequence, as well as the film, ends on another close-up shot of a microscope as the camera dollies back to reveal the whole instrument. Thus, while the film accomplishes its mission as an industrial to illustrate the process of lens production, Watson and Webber utilize virtually every cinematic technique available to the filmmaker, from abstract animation to camera composition, from montage to superimpositions through optical printing, in the process referencing well-known avant-garde works. *The Eyes of Science* may, therefore, be read not only as a treatise on camera vision, optics and the production of lenses, but also as a metafilm that self-reflexively catalogues the tools of the contemporary filmmaker.

The production of *Highlights and Shadows* (which runs 71 minutes), occurred in the winter and spring of 1937–38. James Sibley Watson is credited as the producer, in cooperation with the Kodak Research Laboratories. The only other credit in the film pertains to the musical accompaniment by Dr. Howard Hanson of the Symphony Orchestra of the Eastman School of Music, who utilized his own compositions, as well as those by Burrill Phillips, Bernard Rogers and Wayne Barlow, all of whom were teaching composition at the Eastman School. Other sources credit Lowell Thomas, the voice of the Fox-Movietone Newsreels, as the on-screen narrator, and Kenneth R. Edwards of Eastman Kodak as production manager.[50] These more professional credits seem to indicate that Kodak had a much stronger hand in the production than Bausch & Lomb may have had on the earlier film, its length also dictating a much more extensive budget.

Highlights and Shadows, like its predecessor, had a rich and varied exhibition history. It was apparently first shown at a Hollywood meeting of the American Society of Cinematographers in June 1938, garnering much praise.[51] The film was then screened for Kodak employees in Rochester on 15–16 July at the Eastman Theatre and again on 6–7 October for Kodak stockholders and their families.[52] Another preview took place at the Waldorf-Astoria in New York on 18 August 1938, and was attended by members of the national press as well as a large number of camera notables and photographic dealers. As a later press report noted, the film 'has been highly praised by Hollywood producers and cameramen, as well as newspaper reviewers throughout the country'.[53] On the other hand, one reviewer complained: 'the music, instead of supporting the film, dominated it distressingly, perhaps not in volume, but in insistent rhythm and tempo that soon became annoying'.[54] Was he referring to its modernist vocabulary? Made available free of charge in 16mm by Kodak, *Highlights and Shadows* was distributed to amateur movie and camera clubs throughout the country, and was also included in Kodak's nationwide 1939 print exhibition, shown in Boston, Philadelphia, Washington, Pittsburgh, Buffalo, Cleveland, Indianapolis, Milwaukee, St. Paul, Denver, Kansas City, St. Louis, Memphis, Atlanta and Detroit, among other cities, as well as at Kodak's 1939 New York World's Fair Pavilion.[55] One can, therefore, assume that literally hundreds of thousands of individuals saw the film.

Detailing the manufacture of photographic and motion picture equipment and film, *Highlights*

Fig. 6. *Highlights and Shadows* (1937). Directed by James Sibley Watson. [Frame enlargement from 35mm print, Motion Picture Department Collection – George Eastman House.]

and Shadows begins with a frontal close-up of a Kodak Ektar 305mm lens, while the credits are superimposed on the face of the lens. While the lens continues to function as a frame, an optically produced iris opens revealing a revolving globe, followed by another iris of an Egyptian native filming the Sphinx with a 16mm camera; optical wipes then connect individuals in local dress filming or photographing sites/sights in Holland, Greece, Japan, London, Spain, Berlin and China. If early cinema brought the wonders of its imaginary and exotic geography to a stationary audience, these images now include the subject both as producer and consumer. As if to underscore this participatory aspect in the production of moving and still images, Watson continues with a dissolve montage of amateurs and Hollywood professionals filming or photographing; they, not the full-frame environment, are now the centre of attention. The lens/frame remains clearly visible throughout the sequence, again invoking the trope of the camera eye, now seen as a truly international phenomenon, deeply affecting producers and consumers of photographic images. In the next shot, Lowell Thomas stands in front of a completely black background, explaining that motion pictures are now an experience of eyes and ears, an optical soundtrack magically appearing frame left, modulating exactly in tune with Thomas's voice. Three shots of a motion picture developing machine and a film projector gate follow, the sequence closing by returning to the globe, reflected in the camera lens. Thus, within this introductory sequence, Watson has made the cinema's image and sound technology transparent, allowing the viewer to reflect on the nature of the experience as a mechanically-produced reflection of the world.

The main body of *Highlights and Shadows* profiles four divisions of the Eastman Kodak Company: Camera Works, Hawkeye Works (optical), Kodak Park (film and photographic paper manufacture)

and the Research Department, with the greatest amount of screen time devoted to Kodak Park: 34 minutes versus 25 minutes for the other sections. Each entity is portrayed in intricate detail with an emphasis on production processes. The nine-minute 'camera works' sequence consists of nearly 150 separate shots, which Watson sets in motion through a mixture of moving camera shots, dissolves, multiple exposures, and montages, all of which visualize industrialized production of photographic and motion picture cameras. Alternating moving camera shots of the assembly line process with close-ups of skilled workers constructing cameras or camera parts, Watson inserts images (often multiple exposures) of the final product, highlighting its aesthetic beauty and design. Narrator Thomas's script focuses on several issues, including the efficiency and skill of the handworkers, the uses of technology to improve products, and the implementation of quality control through scientific instrumentation, all of which result in 'precision instruments of excellent accuracy' that match the quality of hand-crafted products at a fraction of the price.

And just as the products demonstrated are expertly crafted, so too does Watson create an uninterrupted flow of movement through film technique: he matches cuts on form, light and movement, whether within the frame or by the camera. The film's construction is seemingly classical, especially in the way composition privileges a centred and balanced frame, leading the eye of the viewer into the material, much like Hollywood narrative. Yet the viewer is not lulled into unconsciousness, the sheer number of shots and amount of information presented on the soundtrack precluding such a state; the lecture directly comments on the mechanical and labour processes being illustrated. Indeed, while the industrial film may mimic avant-garde technique, but may not be avant-garde in terms of its creation of a self-conscious viewer through cinematic devices and formal play, many industrials nevertheless require the active participation of the viewer in order to process the quantity and quality of images and words. The 'Research Laboratory' section is instructive in this regard.

Highlights and Shadows argues here that experimentation is the foundation of modern industrial manufacturing, utilizing principles of the scientific method and management to find practical solutions, invoking through its narration the language of technocracy:

Fig. 7. *Highlights and Shadows* (1937). Directed by James Sibley Watson. [Frame enlargement from 35mm print, Motion Picture Department Collection – George Eastman House.]

> Systematic investigation, controlled experiment, exact analysis, and respect for the document record and the underlining order and logic of the scientific method, the application of these principles to industry's problems has become the established preliminary to all production procedures. Charting the industry on this basis shortens the path of experience.

The sense of freedom exercised in the interest of intellectual engagement and experimentation in the film is underscored through the musical accompaniment, consisting here of only a piano playing the most atonal, i.e. avant-garde, music in the film. Film composition and editing are also radicalized: Watson's camera angles transition from the strict verticals and horizontals of the Kodak production sequences to the expressionist diagonals of *Fall of the House of Usher*, while many shots utilize chiaroscuro, high key lighting, and are edited according to formalist principles. A montage involving laboratory test tubes, glass beakers and agitated, translucent liquids becomes an abstract symphony of reflected and refracted light. The intellectual play of the scientists and academics, engaged for the sake of enlightened capitalist goals, thus finds a correlative in the film's experimental technique.

Returning to the theme of mass communications' global reach, the film's last ten minutes illustrate the multifarious practical applications of contemporary photography and motion pictures,

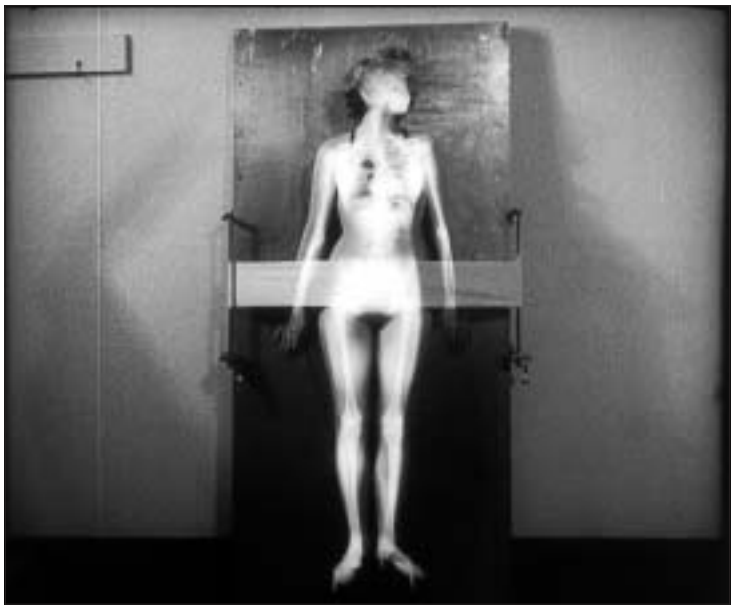

Fig. 8. *Highlights and Shadows* (1937). Directed by James Sibley Watson. [Frame enlargement from 35mm print, Motion Picture Department Collection – George Eastman House.]

running the gamut from x-ray images to newsreels, narrative features to classroom films, photographs distributed by telex to time-motion studies with a film camera, from photographic portraiture to filmed portraits of a city. The last-mentioned sequence cribs shots from *Berlin, Symphony of a City* just as, previously, the viewer has seen clips from D.W. Griffith's *America* (1924) and a synch-sound sequence of the late Will Rogers (illustrating film's ability to reanimate the dead) as well as the coronation of George VI. Such a sampling of archival film images would not become a hallmark of avant-garde film practice until decades later. Meanwhile, the professionally-made archival images transition almost imperceptibly to moving images of amateur leisure time activities and, finally, to a home movie of a wedding, intercut with shots of a family watching the wedding footage in their living room. Thus, the arc from the professional to the amateur, from the producer to the consumer, is once again bridged, bringing the film to a close on the same sequence of images from around the globe seen at the film's beginning.

Clearly, both *Highlights and Shadows* and *The Eyes of Science* can be read as discourses on industrial scientific management in the era of industrial high capitalism. Like virtually all industrials produced in the twentieth century, these films emphasise efficiency, frugality, science and technology as means of producing high-quality goods on an assembly line, allowing American corporations to pass on the savings to the consumer. In the film and photography industries, these high-quality, lower cost goods could, therefore, be made available to middle class and even working class consumers, not just the wealthy elite, allowing these communications media to expand beyond the realm of professionals. Amateurs are, in fact, the target audience for these films, since they, rather than professionals, constitute a mass market that can sustain industrial growth.

Quoting art theorist Kirk Bond, Lisa Cartwright correctly argues that James Sibley Watson was anything but a radical, belonging instead to 'the right wing of film art' which advocated a strict separation between art and politics.[56] Having been born into the country's hereditary power elite, Watson utilized avant-garde cinematic forms to better communicate what he saw as straightforward facts about local industries, firm in the belief that rational argument would win over any audience. Imbricated in the ideology of industrial capitalism, these films about the photographic industry today nevertheless give insight into industrial processes which have since become obsolete, and into audience desires that continue to develop in other (digital) media.

Notes

1. J.S. Watson, Jr., 'An Amatuer Studio Picture', Transactions of the Society of Motion Picture Engineers 33 (April 1928): 216. See also Lucy Fischer, 'The Films of James Sibley Watson, Jr., and Melville Webber: A Reconsideration', *Millennium Film Journal*, No. 19 (Fall–Winter 1987): 40–49.
2. See *National Board of Review Magazine*, January 1929. See also 'Club Library', *Amateur Movie Makers*, 4, 7 (July 1929).
3. Letter, James W. Moore to Frank Stauffacher, 28 January 1947, 'Art in Cinema' files, Pacific Film Archives, Berkeley, CA.
4. *Amateur Movie Makers*, 9, 2 (February 1934): 83.
5. Quoted in Malin Wahlberg, 'Wonders of cinematic abstraction: J.C. Mol and the aesthetic experience of science film', *Screen*, 47, 3 (Autumn 2006): 287.
6. See my introduction to *Lovers of Cinema: The First American Film Avant-Garde* (Madison: University of Wisconsin Press, 1998).

7. 'The Ten Best', *Amateur Movie Makers,* 8, 12 (December 1933): 499.
8. Henry Clay Gipson, *Film in Business and Industry* (New York: McGraw-Hill Book Co., 1947), 34.
9. O.H. Coelln, 'The Camera Eye', *Business Screen*, 31, 10 (October 1972): 17.
10. See Richard Meran Barsam, *Nonfiction Film: A Critical History* (New York: E.P. Dutton & Co., 1973), 13f; Erik Barnouw, *Documentary: A History of Non-Fiction Film* (London: Oxford University Press, 1974); Jack C. Ellis, *The Documentary Idea: A Critical History of English Language Documentary Film and Video* (Englewood Cliffs, N.J.: Prentice Hall, 1989).
11. Slide is an excellent source for much of the corporate history of industrial film production. See Anthony Slide, *Before Video: A History of Non-Theatrical Film* (New York: Greenwood Press, 1992). See also Jay E. Gordon, *Motion Picture Production for Industry* (New York: MacMillan Co., 1961); Leopold Stork, *Industrial and Business Films* (London: Phoenix House, 1962); John Burden, *The Work of the Industrial Film Maker* (London: Focal Press, 1973); Walter J. Klein, *The Sponsored Film* (New York: Hastings House, 1976); Jerry McGuire, *How to Write, Direct and Produce Effective Business Films & Documentaries* (Blue Ridge Summit, PA: Tab Books, 1978).
12. Rick Prelinger's archive of 'ephemeral film', his CD Rom and his website for downloading material are invaluable. See 'Ephemeral Films, 1931–1960' (CD Rom), New York, Voyager, 1994. See also http://www.archive.org/details/prelinger Previously, one of the few filmographies available was Helen Steadman, *The Industrial Film Guide* (London: Kogan Page, 1974).
13. http://www.filmpreservation.org/projects/industrial.html
14. Michel Foucault, *The Archeology of Knowledge* (New York: Pantheon Books, 1972), 138f.
15. Hiram Percy Maxim, 'Editorial', *Amateur Moving Makers*, 6, 12 (December 1931): 655.
16. Charles Musser, *Edison Motion Pictures, 1890–1900* (Washington DC: Smithsonian Institution Press, 1997), 310.
17. Charles Musser, *The Emergence of Cinema: The American Screen to 1907* (New York: Charles Scribner's and Sons, 1990), 359, 476.
18. Kathryn Fuller, *At the Picture Show: Small Town Audiences and the Creation of Movie Fan Culture* (Washington DC: Smithsonian Institution Press, 1996), 79f.
19. Epes W. Sargent, 'Celluloid that Sells', *Amateur Movie Makers*, 7, 2 (February 1932): 63.
20. Anthony Slide, *Before Video*, 3.
21. Walter J. Klein, *The Sponsored Film* (New York: Hastings House, 1976), 24.
22. *Industrial motion pictures; how to circulate them and a few cautions regarding their manufacture and distribution* (New York: National Personal Association, 1922).
23. Paul Rotha, *Documentary Film* (New York: W.W. Norton & Co., 1939), 53.
24. Louis M. Bailey, 'Educational Films', *Amateur Movie Makers*, 6, 8 (August 1931): 435.
25. Founded by F.O. and Betty Calvin, the Calvin Company continued to operate for decades, until it was dissolved in the 1980s. Rick Prelinger recently donated the Calvin Company archives to the Library of Congress.
See http://en.wikipedia.org/wiki/Calvin_Company
26. Founded in 1926, under the leadership of Hiram Percy Maxim, the ACL published *Amateur Movie Makers*, but generally left the organising of amateur film clubs to local members. See Patricia Zimmermann, *Reel Families: A Social History of Amateur Film* (Bloomington, IN: Indiana University Press, 1995), 71–72.
27. See Louis Miller Bailey, 'Educational Films', *Amateur Movie Makers*, 7, 3 (March 1932): 107.
28. Arthur L. Gale, 'Amateur Clubs', *Amateur Movie Makers*, 7, 4 (April 1932): 171.
29. Sargent, 'Celluloid that Sells': 63.
30. Ibid.
31. Cyril Pressgrave, 'Planning industrial films', *Amateur Movie Makers*, 9, 2 (February 1934): 58, 77.
32. Hildegarde Lasell Watson, *The Edge of the Woods: A Memoir* (Rochester: privately published, 1979), 83.
33. See Cartwright, 'The Right Wing of Film Art', in Horak (ed.), *Lovers of Cinema*, 159.
34. Watson, 'The Edge of the Woods', 105, 108.
35. Cartwright, 'The Right Wing of Film Art', 170.
36. Arthur Gale, 'Amateur Clubs', *Amateur Movie Makers*, 4, 5 (May 1929): 339. See also *Amateur Movie Makers*, 3, 8 (August 1928): 548.
37. Frederick Kiesler, '100 Per Cent Cinema', *Close-Up*, 3, 2 (August 1928): 35–38; see also 'Four Screen Theatre Being Built Here', *New York Times*, 9 December 1928, Sec. II, 1.
38. James Sibley Watson, *Amateur Movie Makers*, 4, 1 (January 1929): 847; Melville Webber, 'Simplified Settings', *Amateur Movie Makers*, 5, 3 (March 1930): 146f.
39. Watson, 'An Amateur Studio Picture': 7.
40. Adolph C. Glassgold, 'The Films. Amateur of Professional?', *The Arts*, 15, 1 (January 1929): 58.
41. All the films of James Sibley Watson have been

preserved in 35mm from the original nitrate negatives at the International Museum of Photography at George Eastman House. Thanks to Edward Stratman for making copies of Watson's industrials available to me.

42. The optical printer, as well as Dr. Watson's films and papers can be viewed in the Film Collections at the International Museum of Photography at George Eastman House.

43. Herman Weinberg, '*Lot in Sodom*', *Close-Up*, 10, 3 (September 1933): 268; Marianne Moore, '*Lot in Sodom*', *Close-Up*, 10, 3 (September 1933): 318–319. See also *The Nation*, 138, 3576, 17 January 1934; *The New Republic*, 78, 21 March 1934.

44. *Amateur Movie Makers*, 6, 5 (May 1931): 293. *The Eyes of Science* was copyrighted by Bausch & Lomb Optical Company on 11 August 1930; it is listed as three reels, MP2501.

45. 'The Ten Best', *Amateur Movie Makers*, 6, 12 (December 1931): 657. The film is listed as having a length of 3,000 ft (3 reels) in 35mm (as did the first notice), which would have given it a running time of approximately 30 minutes, but in fact the surviving negative only runs approximately 12 minutes. It is unclear whether the film was shortened or the editors made an error.

46. Arthur L. Gale, 'Amateur Clubs', *Amateur Movie Makers*, 7, 2 (February 1932): 61. For further reports of screenings, see *Amateur Movie Makers*, 7, 4 (April 1932): 150; 7, 5 (May 1932): 223; 8, 2 (February 1933): 64.

47. *The Camera*, 58, 3 (March 1939): 207.

48. Ted Nemeth is also credited in Bute's film, which like the Bruguière film is available on Image Entertainment's DVD set, *Unseen Cinema. Early American Avant-Garde 1894–1941*, as are Watson and Webber's *Fall of the House of Usher* and *Tomatoes Another Day*.

49. See Wahlberg's (2006) excellent essay on J.C.Mol; On Jean Painlevé, see Andy Masaki Bellows, Marina McDougall with Brigitte Berg (eds), *Science is Fiction: The Films of Jean Painlevé* (Cambridge, MA: MIT Press, 2000).

50. '*Highlights and Shadows*: Kodak's New Film', *Kodak. A Magazine for Eastman Employees*, 17, 4 (August 1938): 11.

51. *American Cinematographer*, 19, 7 (July 1938): 281.

52. Eastman Kodak press release, 5 October 1938, sent to the *Rochester Times-Union, Rochester Democrat & Chronicle* and *Rochester Evening News*, Kodak Collection at George Eastman House.

53. See 'Film Depicts Camera's Role', 19 August 1938. Unidentified press clipping, *Highlights and Shadows* vertical file. See also 'YMCA to Show Special Movie', *Richmond News Leader*, 12 April 1939. Billy Rose Collection, New York Public Library.

54. 'Eastman Presents *Highlights and Shadows*', *The Camera*, 57, 4 (October 1938): 262.

55. See reports in *The Camera*, 58, 1 (January 1939): 37; 58, 2 (February 1939): 118; 58, 4 (April 1939): 277; 58, 5 (May 1939): 371; 58, 6 (6 June 1939): 444, 446; 59, 2 (August 1939): 114.

56. Cartwright, 'The Right Wing of Film Art', 166 ff.

Abstract: A neglected genre: James Sibley Watson's avant-garde industrial films,
by Jan-Christopher Horak

Much industrial film production, whether involving amateur avant-gardists or professionals, remains *terra incognita*, despite the fact that audiences for industrials at certain times in the twentieth century rivalled and even surpassed those of Hollywood films, whether shown theatrically or non-theatrically. While not all industrials can be read as avant-garde, certain industrials at the very least mimic the kind of formal play that has defined the avant-garde, including James Sibley Watson's *The Eyes of Science* (1931) and *Highlights and Shadows* (1937). This article details the production and reception of these films by drawing on previously unavailable corporate and archival material.