CLASSICAL HOLLYWOOD AS AN EPISTEMOLOGICAL NETWORK

Birk Weiberg

The paper discusses optical effect techniques of the 1930s and early sound film as intrinsic practices of commercial cinema. The approach only to be sketched here is to discuss structures, machines, people, and institutions as tantamount agents of an epistemological network where education turns into means of development and control.

Perhaps no other medium has been described, analyzed, and understood in relation to other media as much as film has been. Theatre, photography, and magic provided a framework for understanding the intermediality of film as an exchange between people, objects, and techniques. In what follows I shall leave aside the peculiarities of these entities, and shall instead regard them as equivalent containers of knowledge – a reduction that resembles Bruno Latour's concept of an ontological symmetry of human and non-human actors. [1]

The attempt to describe Hollywood around 1930 as an epistemological network immediately raises the questions of how much external knowledge was necessary and how much was digestible to support the development of a relatively young medium like film at that time? I shall claim that Hollywood progressively excluded external 'actors' and therefore was forced to establish its own structures in order to compensate this loss or integrate knowledge on its own terms.

The fact that most people working in the industry did not have higher or specialized education proved to be favorable for achieving independence. Autonomy here means self-referentiality as opposed to intermediality.

1 Hollywood & Education

In 1927, banker Joseph P. Kennedy, who had recently made his first ventures into the movie business, organized a lecture series at Harvard Business School. It consisted of speeches by Hollywood representatives – most of them producers or executives. Kennedy's interest was to show to the upcoming economic East Coast elite that film was a legitimate and rational business. Furthermore, he used the course to consolidate his industry network. Kennedy later published the lectures under the title *The Story of the Films* [2] and sent myriad copies to leading figures in the film business.

An invitation to Harvard was considered prestigious. Therefore, even the seriously ill president of MGM, Marcus Loew, accepted. Deeply impressed by standing in front of highly educated young men he started his speech as follows: "I cannot begin to tell you how it impresses me, coming to a great college such as this to deliver a lecture, when I have never even seen the inside of one before." [3] The notion of Hollywood as a place of "widespread illiteracy" [4] was cultivated inside and outside the system. The two seminal descriptions of 'the movie colony' by Leo Rosten (1941) and Hortense Powdermaker (1950) remain internally inconsistent about the educational level of their objects of study, both perpetuating and discounting the cliché. "The fallacy of our stereotypes about Hollywood is strikingly illustrated by the

fact that whereas uneducated captains of industry are praised as 'self-made men,' uneducated movie executives are dismissed as 'illiterates.'" [5] But even in its delusiveness, the notion of illiterateness was constituent for both the dynamic and the self-image of the film industry. "Since many of the fortunes are made by men with little training or special ability, the idea that they can be made by anyone persists." [6]

Whether the level of general education among Hollywoodians was below or above that of other social groups, initially there was no chance to gain expertise through formal education. Just as the lecture series at Harvard remained a singular case, the 1920s and 1930s did not see film programs at American universities or established art schools – with the exception of the University of Southern California (USC). There were a variety of offers by private technical schools whose main aim was not to educate but to make profit, exploiting dreams of film careers in acting, script writing, cinematography, or film projection.

Despite the awareness that Hollywood had its own needs for education, universities were first of all seen as a market and not as a source of knowledge. With the introduction of sound in the late 1920s, the option to produce educational films and distribute them for teaching and learning purposes seemed reasonable. Films with lectures were not only cheap to produce but at the same time could sanitize the image of the film industry. The entry of film as a teaching aid also paved the way for teaching film. But universities initially showed a genuine reluctance toward commercial film production, and confined themselves to courses for amateur filmmakers.

With World War II, the focus shifted from educational films to training films that conveyed technical rather than propositional knowledge. The U. S. military was confronted with huge amounts of green recruits who had to learn how to fight. Know-how here was more important than know-what or know-why. The thousands of films that emerged within a few years – with a few exceptions – were not produced in Hollywood but by newly established or expanded military institutions like the U. S. Navy's Photographic Science Laboratory in Anacostia, Washington, D. C.

The military qualified not only soldiers but also film professionals as part of its communication and reconnaissance tasks. They were the first filmmakers who learned their craft outside the film industry. When the war was over, movies seemed to be a legitimate career option for many of them. The University of California Los Angeles (UCLA) only in 1947 started its first practical film courses and thus provided knowledge independently from the industry.

The dissolution of the studio system after the war was hence not only a result of the triumph of television and antitrust legislation. The shift in epistemological structures as it was caused by the education within the military and subsequently in universities had a similar effect as the divestiture of the economic monopoly.

2 Film Knowledge

How was the acquisition and production of knowledge organized until a formal education of film production existed? We can roughly distinguish here between two phases. During the first phase, any kind of epistemological network, including Hollywood, tries to constitute itself. Therefore, at first Hollywood gathered knowledge (again in form of information, people, and machines) from other networks, i. e.,

photography, theatre, fine arts, and magic. When in the 1920s the network had reached a significant degree of coherence, it tried to translate stability into autonomy, and therefore tended to reject external knowledge. This included not only techniques of production but also tasks that might be considered external, such as censorship, which it effectively internalized through the notorious Hays Office.

Hollywood, it seems, aimed at a greater degree of independence than other industries. "The stimulus of contact with those from other fields of endeavor, which is so accessible in most big cities, is lacking in Hollywood. For the most part, people work, eat, talk and play only with others who are likewise engaged in making movies." [7]

Besides the studios, unions, and guilds, the Californian film industry created institutions whose main aims had an epistemological but non-scientific character. Three such institutions that shaped knowledge in Hollywood are the Society of Motion Picture Engineers (SMPE, today SMPTE, founded 1916), the American Society of Cinematographers (ASC, founded 1919), and the Academy of Motion Picture Arts and Sciences (AMPAS, founded 1927). SMPE organized conventions and published a journal with the aim of technical advancement and standardization. Though these are important tasks, SMPE lacks traits that cannot be found in other industries.

With its emblematic motto 'Loyalty, Progress, Artistry,' the ASC is a rather specific organization that offers membership by invitation only to cinematographers and visual effects artists. Its primary aim is to create an exchange of information among its members which at the same time informs a wider public about the state of the art. From the outset, the ASC published its own magazine containing reports on current productions and interviews with its members. Later the magazine was supplemented by a yearly updated handbook with various information a cinematographer might need while working on a film set. Both publications display the society's ambivalent aims in collecting and distributing knowledge (on techniques and the role of the cinematographers alike) and in building an elite.

AMPAS until today is best known for its annual awards celebration. But the academy's research and educational purposes were at least that influential. Its research council by the end of the 1930s consisted of 36 technical committees. While the ASC limited itself to camera issues, AMPAS could deal with all kinds of questions.

The greatest change cinema saw after its initial establishment was the introduction of sound in the late 1920s. As David Bordwell has described, the production of sound films was not only a technological but also a structural and financial challenge. For shooting a silent film on location, it might be enough if a cameraman brought along his own apparatus. Talkies asked for specific sound stages, built up of sound recording devices and multiple blimped cameras mounted on dollies or cranes. [8]

With increasing expenditures, the studios' small machine shops turned into in-house research departments. Cinematographers and sound engineers tried to compensate for the shortcomings of the equipment from outside manufacturers by improving details or developing their own devices. These inventions – such as the mike boom – were later handed over to manufacturers for mass-production. This way the whole movie industry could profit from them. Industry institutions took on a crucial role in this process. Innovations were often discussed at conventions and later presented in trade journals. In this way, innovators received both credit and appreciation for their work while seeing it advertised at the same time. [9]

This structure was helpful in solving conflicts that overshadowed sound innovation as a whole. Sound technique was developed outside of Hollywood by the telephone and radio industry. A first step toward bringing cinema and sound together came with a variety of contracts, acquisitions, and mergers resulting in structures like RKO Radio Pictures, controlled by the Radio Corporation of America (RCA). One reason why the economic integration did not entail an integrated practice was that sound engineers had quite different notions of what it means to record sound, as James Lastra has shown in his analysis of early sound film production. [10]

As a result of newly arising conflicts, the studios started to retrain their workers. AMPAS in cooperation with the University of Southern California (USC) organized a course program which about 900 employees passed through within two years. "One of the chief merits of the program as far as academy executive Lester Cowan was concerned was the opportunity to train current studio employees to become soundmen instead of importing the latter from other industries." [11] This policy accords with Bordwell's observation that the style of Hollywood cinema remained surprisingly stable while sound recording and mixing practice was developed with strict image-sound analogy. [12]

In addition, we can assert that from an epistemological viewpoint the introduction of sound amounted to a major turnover, as it consummated the electrification of film production. Silent film was at its core an opto-mechanical operation that required little theoretical knowledge. Sound technology contained elements that no longer could be seen or even touched, and which therefore required a sublimation of the production process. This passage from technical knowledge to propositional knowledge – from knowing how to knowing that – meant an intellectual challenge to Hollywood that slowed the transition.

3 Optical Effects

The development of optical effects received less attention than that of sound technique. One reason might be that due to the smaller market for corresponding devices, it was difficult to activate larger networks. While sound knowledge circulated between studio technicians, industry associations, and external manufacturers, optical effects during the 1930s remained a topic for the studios' trick departments. Bordwell claims similarities between the post-production phases of image and sound, attributing the fact of consistent terminology ('fades,' 'dissolves') to the equalization of both domains. [13] Besides, we can assume that through the necessity of sound mixing, the post-production of films received increasing attention in general. Likewise, optical post-production could profit from the controlled environment of sound stages.

Two techniques that reached maturity in the 1930s are rear projection and optical printing. One precondition for the regular application of both practices was the increased quality of film stock, which allowed additional generations in the printing process. Compositing, i. e., the consolidation of various image layers into one coherent composition, was by then achieved through techniques adopted from theatre and photography. These included painted sets, miniatures, glass paintings, and double exposure. Though these techniques – especially glass shots – produced satisfactory results they amounted to constraints in shooting. One regular assignment was to complete a building of whose first floor was the only storey that was actually built; additional stories were painted on a glass plate in front of the camera. Such painting had to be done on the set in order to have a fitting perspective and shading. The industry had an interest in postponing these parts of the job to post-production phase for reasons of flexibility and additional creative options. There are two central figures who advanced the two techniques that were in need here. Farciot Edouart, Head of Transparency Department at Paramount Studio, worked on rear

projection while Linwood Dunn of RKO Radio Pictures refined optical printing. Born only ten years apart, Edouart and Dunn signify a shift from imported to acquired knowledge, since the former could draw on a family heritage of photographic craft.

Before Dunn started his career at RKO, he worked his way up as a cameraman without any formal education. Remembering his first days in optical effects, he said, "I learned by doing. […] I knew really very little. I'd done a lot of trick work in the camera in the silent days – composites, mattes, split screens, things we all did. The first optical printer I saw there was nothing but a lathe bed with a Mitchell camera stuck on it, facing a projector." [14]

Neither Dunn nor the apparatus were literally 'informed' in a Flusserian way. As there was no regular way of learning visual effects, there was no long-term practice of developing the machines for it. Due to a lack of research budget in film production, studio technicians used current productions to develop their infrastructure. It remains for further research to determine if this dependence on day-to-day production substantially influenced optical printing and other techniques, or if it only deferred developments.

That optical effects were an important but not yet essential part of film production becomes clear when looking at how Dunn had to promote his activities. Since the early 1930s, he was active in SMPE, ASC, and several other institutions. He lectured on optical effects at conventions and published articles in trade journals. In one of them, he not only lists 13 different studio departments that profit from the "Optical Printer Handy Andy" [15] but also describes how a virtual Landscape Department might benefit from his apparatus as well.

Dunn's optical printer at RKO was of course not the only one of its kind in Hollywood. Most studios had similar devices, but all of them were unique. This singularity had the effect of embedding the features and procedures of effects production. Technical knowledge was produced and circulated as it had been in pre-industrial crafts or artists' studios. In order to keep effects-knowledge available, it needed to be packaged in a distributable form – a process which the history of science calls 'blackboxing.' "The word *black box* is used by cyberneticians whenever a piece of machinery or a set of commands is too complex. In its place they draw a little box about which they need to know nothing but its input and output." [16]

Just as a black box itself is a stable object, it helps the building of such a device to have a steady environment. Though the studio system as a whole can be described as stable, this does not apply to the position of optical effects, as Dunn's efforts to strengthen his position have shown us. The network that was needed to finish his optical printer was provided only when the USA entered World War II and the military upgraded its media infrastructure. The aforementioned Photographic Science Laboratory was built in 1942 and 1943. It was supposed to provide the Navy with all still and motion picture services required, i. e., aerial reconnaissance and the production of films for training and publicity. The Eastman Kodak Company was assigned to plan and equip the laboratory, but had to learn that the optical printer they needed was not "a commercial 'shelf item' product." [17] As a result, a network was established that would produce the first apparatus of its kind that was patented and later could be ordered as such. The inner network consisted of Linwood Dunn at RKO, his studio assistant Cecil Love, who was serving at the Navy laboratory, and the Acme Tool and Manufacturing Company, a machine shop in Burbank that entered the movie business when modifying animation stands for Walt Disney.

Having been built with both external support and internal knowledge, the Acme-Dunn Optical Printer stands as a contradictory object: from an ontological viewpoint, it marks an idiosyncratic break or watershed, when film shook off the old allegation of merely reproducing reality and took on the status of self-referentiality, by filming film and thereby opening up the potential of using copying as a creative process. At the same time, it encapsulated knowledge of the studio system and helped to transmit the very same structure forward into the post-classical era. This device transcended some of the tasks for which it had originally served, and accelerated the medium's advance.

References and Notes:

1. B. Latour, "On Actor-Network Theory: A Few Clarifications," in Soziale Welt47, no. 4 (1996).
2. J. P. Kennedy, ed., The Story of the Films (Chicago: A. W. Shaw, 1927).
3. Quoted in B. Lasky, RKO: The Biggest Little Major of Them All (Santa Monica: Prentice Hall Trade, 1989), 19.
4. L. C. Rosten, Hollywood: The Movie Colony, The Movie Makers (New York: Harcourt, Brace and Company, 1941), 58.
5. Ibid., 6.
6. H. Powdermaker, Hollywood, the Dream Factory (Boston: Little, Brown and Co., 1950), 24.
7. Ibid., 19.
8. D. Bordwell, "The Introduction of Sound," in The Classical Hollywood Cinema: Film Style & Mode of Production to 1960, eds. D. Bordwell, J. Staiger and K. Thompson, 298 (New York: Columbia University Press, 1985).
9. Ibid., 299.
10. J. Lastra, "Standards and Practices: Aesthetic Norm and Technological Innovation in the American Cinema," in The Studio System, ed. J. Staiger, 206ff (New Brunswick, NJ: Rutgers University Press, 1994).
11. Ibid., 214.
12. D. Bordwell, "The Introduction of Sound," in The Classical Hollywood Cinema: Film Style & Mode of Production to 1960, eds. D. Bordwell, J. Staiger and K. Thompson, 301ff (New York: Columbia University Press, 1985).
13. Ibid., 303.
14. Quoted in G. Turner, "Linwood G. Dunn, ASC," in AC 66, no. 12 (1985): 38.
15. L. G. Dunn, "Optical Printer Handy Andy," International Photographer 10, no. 5 (1938).
16. B. Latour, Science in Action (Cambridge, MA: Harvard University Press, 1987), 2f.
17. L. G. Dunn, "Historic Facts about the Acme-Dunn Optical Printer," AC 62, no. 5 (1981).