Beyond the Screen: Institutions, Networks and Publics of Early Cinema

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Dissecting the Medical Training Film

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As we know, educators of all stripes immediately recognised the pedagogical value of motion pictures. Projected film, like slides, could reach a much larger number of students than could any individual demonstration. And unlike slides, films could present a moving record of the event or object under study; they could thus function effectively as a convenient substitute for the object. Furthermore, many advocates favourably compared film to books because film’s moving record, they claimed, had an impact that was not only more powerful than the written word, but also more immediate. In other words, many of the claims for educational film are variations on one theme: efficiency. Reaching more people in less time, communicating with greater impact and more convenience, the motion picture was hailed as the ultimate appliance for learning, a device that could cut educational work and waste in half. In both Europe and the United States, the rhetoric of efficiency influenced just about every statement on the advantages of film as a pedagogical tool, which is not surprising considering that “efficiency” was a mantra chanted by nearly every reformer, ideologue, or would-be manager from around 1900 to 1920. Social engineers of all types hoped to increase productivity and reduce waste through techniques designed to get the most out of the energy put in.

Medicine also shared this agenda, especially but not exclusively in the United States. Efficiency was a key concept in transforming the turn-of-the-century hospital from “a well of sorrow and charity” into a “work place for the production of health.” In the United States from around 1900 to 1920, health officials were increasingly dissatisfied with the duplication of services, the lack of coordination of units, and the generally low level of effectiveness in patient care among clinics, dispensaries, and hospitals nationwide. “Efficiency” became an institutional logic to promote standardisation of facilities, services, and administration. In fact, in the United States at least, efficiency was the rubric through which the modern hospital adopted business practices in order to establish itself as a more acceptable place for treatment and to attract paying patients.

For example, Modern Hospital, the organ of the American Hospital Association, devoted itself to promoting economy and efficiency in hospital management, while the American College of Surgeons was established initially to focus on the standardisation of tools and techniques within surgical practice.

During this period, the medical training film stood at the intersection of medicine, efficiency, and cinema. Given its admittedly esoteric status, it is fair to wonder why we should be interested in this genre. First, as the international medical community adopted motion pictures as an educational device, health professionals made especially clear statements about the value of film for pedagogy. These statements expressed, explicitly or implicitly, a nascent theory of film, one that can also be inferred from
examples in other educational arenas. So if we were to excavate a history and theory of educational film, its appropriation by the medical community would need to be included. Second, the discussions of film as a training medium are especially intriguing, because they shared a common assumption about the efficacy and effect of the moving image on the viewer; I will call this the "presumption of mimesis". Descriptions of the uses and advantages of training films implied that the spectator was to "follow" the film by way of inner mimesis or kinesthetic empathy. That is, the descriptions noted especially clearly the visceral effect of moving images. We move with the film; the discussions implied that a training film triggered some aspect of muscle memory and that spectators "learned" the appropriate gestures from the image, almost directly. Some statements about the educational value of motion pictures were quite explicit in this regard. In other words, if we were interested in early discussions about embodied spectatorship, the discourse about training films would be a good place to start.

So medicine, efficacy, and film intersected in two ways: film was used to train surgeons to use more efficient techniques, and film was applauded as an especially efficient training tool. According to its advocates, the training film could efficiently tutor viewers to be efficient. This essay will outline the connections between the rhetoric of efficiency and assumptions about the pedagogical value of the medical motion picture, focusing on pioneers in Germany, France, and the United States. There were other uses of film in medicine, of course, such as research films or health education films aimed at lay audiences, but this essay will focus on educational uses within the medical community. By "training film" I mean films that instructed for specific skills, as well as more general educational films designed for medical students or professionals; specifically, I am interested in two early (and familiar) proponents of the medical training film, Parisian surgeon Eugène Louis Doyen and American efficiency experts Frank and Lillian Gilbreth. Through these filmmakers we can see the extent to which the cinematic image was held as a model of efficiency.

Frank and Lillian Gilbreth were well-known efficiency experts in the United States, especially prominent between 1910 and 1920. They adopted Frederick Taylor's principles of scientific management, but they differentiated their methods from his by rejecting Taylor's use of a stopwatch as the primary means of measuring worker efficiency. Instead they employed what they considered more "objective" devices, including the motion picture camera, to record, analyse, and improve worker movement; they argued that the stopwatch depended too much on the operator for results (the time for a task, for example, depended on when the operator started and stopped the watch, which many claimed was inconsistent from case to case), while they viewed their approach as more independent of operator error because they could record the entire task and deduce the time from calculations based on the recording. Other tools included their ubiquitous chronometer, in order to gauge distance to time; and a white, grid-pattern wallpaper, against which the subjects were filmed and which served simultaneously as a reflective surface and as a rough guide for measurement of hand motions (although not always useful, depending on the camera angle). They also used what they called a "cyclegraph": they attached light bulbs to the subject's hands and then photographed the movements through an open shutter. The resulting exposure would serve as the basis for a wire model that gave a visual, tactile rendering of the most efficient movement. With these devices, the Gilbreths deconstructed movement into different elements and rendered them graphically, which ultimately helped them determine the most efficient use of worker energy and time. They employed this method to a number of tasks, from bricklaying to typing to golf.

It is not well-known, however, that between 1912 and 1917 the Gilbreths focused their attention and technologies primarily on surgeons. This move was, in part, a clever publicity strategy; the Gilbreths felt that if they could persuade surgeons of their methods, they could persuade anybody. In fact, they did have some influence; a number of surgeons considered themselves disciples of Gilbreth efficiency and peppered journals with articles extolling the benefits of motion study and proper workplace organisation. In their own writings, the Gilbreths focused on standardisation of surgical tools and techniques, on the one hand, and operating room efficiency, on the other. The Gilbreths made their pitch to a number of hospitals on the east coast, and were successful in bringing surgeons to their home in Providence for "standardisation conferences". There is some question, however, about the role of film in their approach. The films that I have seen - which are by no means the only ones - are inconclusive. In certain films, the camera is placed in such a way that the viewer cannot see anything but the backs of the surgeons hunched over the operating table, so it is unclear what help the filmed record could be. Other films focus on operating room organisation; the surgeons and nurses are numbered and coded, for example. In fact, the Gilbreths urged the establishment of the now-standard system whereby nurses hand surgical instruments to the physician during the operation. The Gilbreths were hired as consultants and they used film as part of a larger system for recommending changes in workplace design. In this sense, their use of film as a training device was atypical. Much more typical was the use of films as an educational tool in medical school curricula and in professional settings, such as conferences.

Indeed, film's potential for pedagogy was its most intriguing feature for the medical community, and most medical filmmakers at this time cited their desire to improve teaching. In Paris in 1897, Eugène Louis Doyen, a maverick surgeon known for his innovative techniques and disdain for the academy, employed two cameramen to film his surgeries. These films were meant to illustrate and publicise Doyen's tools and techniques, but they were also to serve as training films for surgeons and as a means to improve Doyen's own performance. In 1899, Doyen wrote: "It has been with the object of completing our means of teaching the art of surgery that I have been led to study and employ the cinematograph." In Germany, too, medical filmmakers had been working since the turn of the century, but the watershed moment came at a February 1910 demonstration of "Film in the Service of Medicine", which focused on educational uses. Representatives from the Berlin medical establishment, including the Imperial Board of Health, were so tightly packed into the lecture hall that the organisers had to turn people away.11 While it was not the first time that such films had been shown in Germany, the event received much attention from the national and international medical community and helped to focus awareness on the educational potential of medical film. The organiser of the event, prominent physician Robert Kutner, praised the power of cinematography:

And how convenient, how effortless! ... [Cinema] has a persuasive evidentiary power beyond that of any other document, beyond even the most vivid description. ... The motion picture projector demonstrates its most spectacular educational applications in auditorium demonstrations of microscopic or macroscopic images of movement. In a normal lecture-room demonstration of movement, especially that of small objects (think, for example, of a frog's beating heart), only a small part of the audience really sees anything, while in a film demonstration everyone present can observe the presentation equally well. Without the assistance of the motion picture projector, almost all X-ray motion pictures and certainly all motion pictures taken from a microscope could be shown to only a small circle or to only one person at a time.
Kutner describes the pedagogical advantages of motion pictures in a language common to advocates of educational film at the time. But Kutner also emphasises the efficiency of the moving image for the pedagogical task; in fact, he implies that there are a variety of efficiencies. First and most obviously, Kutner here refers to economies of scale: the simple claim that more people could see a large projected image than could see a small demonstration. As medical school enrollments in Europe and the United States grew steadily toward the turn of the century, this claim gained traction – lecturers used projected images more and more from the 1870s onward. A number of famous physicians from the turn of the century, such as Vienna’s Theodor Billroth, collected medical photography and film for precisely this purpose.

But Kutner also hints at another kind of efficiency. When he says “how convenient, how effortless!” he is probably not referring to the motion picture apparatus, which was definitely not convenient and effortless. Instead, he is referring to the efficiency of the image itself. It has a “persuasive evidentiary power beyond that of any other document, beyond even the most vivid description”. For Kutner and others, that power came naturally to the image, especially to the photographic image; they assumed that motion pictures worked quickly and effortlessly on the spectator. When Doyen insisted that “with the cinematograph we can make hundreds of people follow in one minute what a whole lecture could not make clear to a limited number of students”, he was making a similar claim. The issue here was not simply about numbers of students – it was about the immediacy of the image versus the indirectness of the spoken word. If the image was considered direct, instantaneous, vivid, and penetrating, then the written or spoken description was perceived as aloof, dull, circuitous. In a way, Kutner and Doyen’s preferences echoed a bias common in modern medical education. The nineteenth century continued a long transformation in medical education (and education in general) that emphasised direct perception of the objects of study over their presentation in books. The discussion of film as an educational tool made this bias even more explicit. Educators viewed the direct perception of objects as a much more effective and efficient mode of learning. The image was efficient because it was presumed to affect the viewer immediately, like a drug, or a blow to the head, whereas reading or speaking and then cognitively processing words supposedly took (too much) time. The image was considered physical and immediate, while the word was seen as intellectual.

What was the presumed ontological basis for this immediacy? What characteristic of the image gave it this apparently direct, instantaneous persuasive power? For many writing about the educational or scientific benefits of film during this time, it was summed up in the concept of “vividness”. Kutner writes, “Cinema has a persuasive evidentiary power beyond that of any other document, beyond even the most vivid description”, implying that film was even more vivid than words, or more pointedly, book-learning. What exactly was this “vividness”? As we know, the clarity, texture, and abundant detail of the photographic image combine with projected movement to give the image a presence unlike any previous representational form. Its level of detail allows the photographic image to reproduce patterns of texture and variation, hence to represent the structure and randomness of the natural world, while the movement of the image presents this world in real time in a particularly striking way. The object “lives” onscreen. This is perhaps obvious, but it is all to say that “vividness” referred to the sense of presence that the moving image evokes. For early advocates of educational film, it was as if the thing itself were there in the room, available to direct perception. Film thus functioned as an object lesson, an acceptable substitute for the thing itself, which was especially helpful in medical demonstrations, where the use of live patients was always logistically and ethically troublesome.

Cinema’s vividness permitted Doyen to extol the virtues of the motion picture over not only books but even cadavers. Complaining about the inadequacy of the long-standing practice of rehearsing surgical techniques on cadavers, Doyen asks, “Do our books fill the gap thus left? Certainly not. The most detailed descriptions, the best diagrams or photographs of the various steps of an operation are inadequate. ... It is not sufficient to follow the operation, as it were, second-hand; rather, the author of the technique, the master himself, must be seen at work. The surgeon is judged by his work, and no text-books, however well-illustrated, can sufficiently express his personality”. In motion pictures, on the other hand, Doyen found a perfect medium to express vividly the personality of the “master himself”. Movies were not “second-hand”; they allowed Doyen to be “present” to the students. This, then, is another cinematic efficiency: to be at more than one place at a time. Even more noteworthy is Doyen’s concept of “personality”. Doyen was not publicity shy, by any means, but he was not concerned to convey via a medical film his charisma and good looks, or not only these things. Primarily, his films were meant to promote his custom-designed surgical instruments and to present his technique – how Doyen held himself and how he moved in order to accomplish his task. Film provided, better than any previous medium, a demonstration of the actual movements required in surgery. Doyen’s personality was his “posture” or “attitude” – his embodied technique. And to convey that personality was to presume that the student would copy it, that while the student watched the film, there would be a kind of kinesthetic empathy whereby the movements seen were somehow felt or incorporated into the student’s own body. This is the mimetic presumption of most training films, it seems; most training films expect us to copy the movements they depict, and that the student will take on the “personality” or “attitude” of the master.

Doyen also extended this presumption to himself. He had in mind another form of efficiency: the power of film to improve his own technique. Doyen explains, “When I saw for the first time one of my operations reproduced on the screen, I recognised how far I fell short of my ideal. Many of the details of technique that had seemed satisfactory I now saw to be defective, and the cinematograph has thus enabled me considerably to correct and simplify, and to perfect my operative technique”. Fifteen years before the Gilbreths, Doyen claimed to have used film to study and correct the performance of work in the name of production efficiency. Whether he actually used film in this way or not is unclear, but the rhetoric is intriguing. “You will notice that each operation is done methodically. ... The surgeon is calm; his movements are precise and calculated. When he makes a muscular effort, you can see his biceps harden, his face contract, his whole body place itself in the most favourable position. The cinematograph registers the whole scene as it takes place, faithfully, rapidly, and in detail. Each step can thus be studied, analysed, critiqued. The surgeon can assist at and calmly study his own operations.” The drama of life and death shapes the practiced movements of the surgeon, giving them an urgency we might not encounter in other training film genres. It is noteworthy that, for Doyen, the cinematograph recorded details of the surgeon’s “personality”, the posture, the muscular effort, the position, as if the student could be somehow imprinted with this attitude or orientation. Anticipating Jean Epstein’s thoughts on the close-up, Doyen similarly evoked the power of film to literally move us. And recalling Gilbreth and other scientific uses of film, he noted the power film gives the analytic eye to examine movement at leisure. Here and elsewhere, the educational film provided fertile ground for early discussions of scientific disinterestedness and embodied spectatorship.

So the medical training film presents an opportunity to discuss the relationship between film, education, and efficiency. In this essay, I have outlined three main
varieties of filmic efficiency. First, film was often touted as an instrument that could provide a faithful record of the thing or event, and thus function as a convenient substitute. I do not mean to say that the apparatus was itself convenient, only that compared to, say, live medical demonstration, film was held up as a potentially suitable alternative, even if rarely acted upon during the early years. Second, advocates appreciated that film could reach more students or viewers with less effort. This took two forms: in the lecture hall, bounded by a particular time and space, and in distribution, where the reproduction and circulation of film could address audiences potentially anywhere and anytime. And finally, film was perceived to be “direct”. Gilbreth said that efficient motion does not go from A to B to C when it could find the best way to go directly from A to C. For many advocates of educational cinema, film worked in the same way: it bypassed the cognitive faculties and imprinted itself directly and immediately on the mind and body, prompting a voluntary or involuntary mimetics. We have heard variations of this theme: cinema and hypnosis, cinema and suggestion, cinema as Mabusian puppetmaster. The paradox of the rhetoric of the educational film is that even though the moving image exemplified the very image of efficiency, that efficiency seemed to cut both ways, for good and for ill.

Notes


4. I thank Caitlin Gainty, University of Chicago, for pointing me in this direction.


8. The Gilbreth films are collected at the Purdue University Libraries Archives and Special Collections, West Lafayette, Indiana, USA. Brief snippets from the surgical films are included on Purdue’s DVD collections *The Original Films of Frank B. Gilbreth, Odd and Ends #2* (2006) and *Odd and Ends #3* (2006).


17. Alongside this discourse of “seeing as”—film as an extension of direct perception and the moving image as a substitute for the thing itself—there was another discourse of “seeing differently”—film as a technology for representing things in ways that the naked eye could not perceive. Educators regarded both features of cinema to be pedagogically useful, while film theorists such as Jean Epstein and Béla Balázs prioritised the latter. Thanks to Rob King for reminding me of the difference.


19. Ibid., 582.

20. Ibid.
