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# Have Digital Technologies Reopened the Lindgren/Langlois Debate?

For almost as long as the profession has existed, film archivists have been the bogeymen of broadcasters, cinema programmers, academics, funding bodies, and the general public. Among these constituencies exists a widespread perception that archivists are inclined to restrict and deny access to their collections and that the not-for-profit archive movement seeks to exercise an inappropriate level of curatorial control over the ways in which its holdings are used. For their part, archivists complain that much of their core user base either fails to understand the constraints under which they work or is guilty of abusing the cultural integrity of the material in their care. They frequently complain about the TV documentary producer who adds digitally simulated dirt and scratches to lovingly restored archive footage in order to make it appear “old” to a lay audience. Another familiar story is that of the 16mm print of an obscure feature which an archivist loaned for an educational screening at a reputable university, only to find out that a few months later, poor quality unauthorized DVD copies, clearly made from that print, have mysteriously appeared in academics’ offices the world over.

At the heart of this tension lies a fundamental and deep-seated misunderstanding between archivists and the majority of their clients, which boils down to three issues: the role of technology in preservation and access, ethical considerations in preservation and access, and the limitations

on access imposed by intellectual property (copyright) restrictions. The technological and ethical considerations can be further reduced to a single, underlying and widely held misconception as to the role of a not-for-profit moving image archive: that its primary, if not its only, function is that of a lending library that provides access to moving images. This is at odds with the training and ethos of a professional film archivist, who is taught from the outset that his or her profession consists of three fundamental ‘building blocks’ (as Ray Edmondson describes them)—acquisition, preservation, and access—and that if one of them is removed (or neglected and allowed to fall into disrepair), the whole edifice collapses.<sup>1</sup>

The problem is that only one of these three blocks—access—is visible from outside the building. But factors related to acquisition and preservation often directly affect the nature of and extent to which access can be made available, and in ways that don’t affect any other form of archival document or medium. Where public recognition of the acquisition and preservation work undertaken by archives exists at all, it is usually in a clichéd and inaccurate form, presented as sequential and unproblematic steps on the road to public access. Possibly the best known example can be found in the spoof documentary *Forgotten Silver* (Costa Botes and Peter Jackson, 1995, New Zealand), in which the camera negative of a lost epic masterpiece from before the first World War is accidentally

discovered in a garden shed, deposited with an archive, and re-released in a glitzy public premiere at a major film festival. The financial, legal, and technical difficulties that would almost certainly be faced in acquiring and preserving such a feature are not mentioned, and the process of making it available to the public is portrayed as routine and unproblematic.

In fact, acquisition and preservation can be very difficult, expensive, and time-consuming tasks. Lack of money, lack of staff expertise, lack of cooperation from copyright owners, and several other factors often prevent work from being carried out within timelines desired by many potential users. But without completing preservation in full, it can be technically, ethically and/or legally impossible for an archive to provide access immediately (or, more rarely, at all). When this happens the messenger—i.e. the archivist—invariably finds himself being shot at.

This article argues that the increasing use of digital moving image technologies, combined with their convergence with other media forms through the platform of the personal computer and the distribution infrastructure of the Internet, is set to exacerbate this situation, and in particular will endanger and jeopardize preservation work, especially in smaller, less well-funded archives. Since the launch of the digital versatile disc (DVD) as a replacement for the consumer videotape format VHS in 1997, computer technology has played an increasingly prominent role in the origination, storage and management of moving images, be it in the form of streamed video delivered to desktop personal computers or other encoding and reproducing technologies based on the microprocessor, such as digital videotape recorders, the DVD, or personal media players such as the iPod. Unlike any previous moving image technologies available to consumers, the power and availability of this technology has exponentially increased in proportion to its cost decreasing over the last decade. This is a familiar phenomenon to information technology professionals, who refer to it as Moore's Law, after the famous prediction made in 1965 by the silicon chip pioneer Gordon E. Moore; he anticipated that the amount of computing power available for a given cost would double every eighteen months, a process that

would continue indefinitely.<sup>2</sup> The effect of this exponential growth on computer-based video technology includes greater media storage capacity, higher resolution images, and higher bandwidth for online delivery systems.

This rapidity of technological change has far outpaced prior developments of moving images in analog formats, a mismatch which has caused the convergence of traditional and computer-based moving image technologies to have a profound effect on archives and archivists. As the Curator of Film at the U.S. Library of Congress argued:

Changes in film technology have been infrequent and gradual and film archivists have been lulled into a sense of false security. Even the major changes that have occurred, the coming of sound, the demise of nitrate raw stock and the introduction of subtractive tri-pack color film, have had little impact on their thinking. It is probably surprising to the younger film archivist that there was not more concern about the passing of nitrate. However, one must remember that in 1951 archives were small organizations with minute budgets that spent most of their time collecting the acknowledged classics of world cinema. Archivists' minds were not tuned to appreciating the impact of such a change on the film experience.<sup>3</sup>

The issue is not just, however, that film archivists are incapable of responding to the challenge of new technology. As archivists, they have to consider not only what new technologies are capable of delivering in the short-term, but also the implications of their use over the long term, especially if that technology is involved in the preservation process. They've had their fingers burnt before. Nitrate decomposition wasn't systematically observed until the late 1930s, and the chemical processes involved weren't fully understood until the 1960s, more than half a century after the medium had entered mainstream use. Similar time lags characterize the emergence of deacetylation (vinegar syndrome) of acetate film, tri-pack color dye fading, "sticky shed" on videotape, and several other major preservation problems. Archivists are dealing not only with the integration of a new

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and rapidly developing technology into their professional practice but also with a constituency of clients whose access expectations have been raised by their experience with these technologies. When a researcher has purchased a machine that will copy VHS tapes to DVD from an electronics superstore for \$200 or has uploaded a family home video to YouTube, it may be difficult to understand why the holdings of an archive cannot be made so readily available, as easily and as cheaply, because back-end preservation work has not been done or the copyright owner has not given permission. The potential of computer-based moving image technologies for expanding the range of material available and delivering it in more versatile ways has created the expectation that everything should be available here, now, and preferably online, an expectation that has been promoted and reinforced by equipment and software manufacturers.

The emergence of computer-based moving image technologies is reviving what has for the last two decades been an effectively dormant issue, but one that dominated the evolution of preservation practices and ethics during the formative years of the not-for-profit film archive sector. The so-called Lindgren/Langlois debate reflects film archives' conflicting priorities in response to the demands of preservation and access.

### The Lindgren/Langlois Debate

Ernest Lindgren (1910-1973) and Henri Langlois (1914-1977) were the founding curators of the UK's National Film and Television Archive in 1935 and the Cinémathèque Française in 1936, respectively. These institutions were among the earliest to be funded by taxpayers for the sole purpose of preserving audiovisual materials on cultural grounds and were founding member institutions of the International Federation of Film Archives (generally known as FIAF, the acronym formed by the initials of the organization's name in French, *Fédération Internationale des Archives du Film*). Lindgren and Langlois were both forceful, determined characters who held diametrically opposed views of the fundamental purpose of a film archive.

As the result of his initial attempts to secure the deposit of feature films for presentation in the

late 1930s, Lindgren rapidly discovered that films were effectively treated as disposable items by the companies that made and distributed them. Before the existence of television, retail video, or any other moving image distribution medium apart from cinema, a typical film's revenue potential derived entirely from its initial theatrical release, after which its owners had no commercial incentive to preserve it. In fact, many studios and distributors deliberately recalled and destroyed extant prints, in order to prevent unauthorized exploitation in overseas territories without effective copyright protection legislation.<sup>4</sup>

As a result, much of the film industry's output from the first three decades was already lost by the time the archive movement began germinating in the mid-1930s. Feature film material that was acquired during this period was mainly deposited following long and sensitive negotiations with its owners, who frequently attached extensive strings determining how they could and could not be exploited. Conscious of the need for his organization to prove its credentials as a legitimate public archive, Lindgren gradually developed policies and working practices that placed preservation at the forefront of its work, often at the expense of access. His methods were motivated by two factors: the need to build trust among studios and distributors, in order to convince them that his archive would deliver its promise of preserving films as records of public memory without commercially exploiting them, and the irreversible damage which can be inflicted on film elements, whether by chemical decomposition or use for access. As Lindgren explained his policy:

No preservation film is projected in any circumstances, even within the Archive's own premises. The film is there as a master copy, and as such it is inviolable. In thirty years no-one has substantiated any complaint of the misuse of a film, and we have never yet lost a single one.<sup>5</sup>

The logic of his argument encapsulates the core of the "debate" between Lindgren and his French counterpart: that if you provide access to master material, you endanger a film's preservation, due to the risk of inflicting irreparable damage (e.g.,



Ernest Lindgren, founding curator of the UK's National Film and Television Archive.



Henri Langlois, founding curator of the Cinémathèque Française.

scratches or perforation damage) on the only known copy. By preventing access until copies have been made from that master for the purpose, you have “bought time,” i.e. ensured that the film will survive in its current condition until time and money allows full-scale preservation work to be carried out. However, as the 1950s and ‘60s wore on, Lindgren came in for sustained and increasing criticism from those who believed that his single-minded approach ignored one of the main reasons for a film archive’s existence: to promote a greater understanding of moving image culture and heritage through access to its holdings. As Penelope Houston puts it:

Preservation, which had been one goal among several, began to seem the only thing that really mattered. Everything was being done in the interests of posterity, and there was no suggestion that posterity was expected to put in an appearance during the next ten years, or even fifty. It was impossible, in fact, to imagine the event that could trigger off the millennium for the Archive, the day when it would release the films.<sup>6</sup>

Lindgren’s French counterpart, Langlois, took a

very different approach. He believed that in order to justify its existence, access to an archive’s holdings had to be proactive and as widespread as possible. Langlois argued that the funding and the will to carry out preservation work could only be secured by generating interest in film heritage. To this end he developed the Cinémathèque Française into one of the world’s leading museums and programming repertory cinemas, drawing on the archive’s own collection. Furthermore, that collection was established by often-unorthodox methods. In contrast to Lindgren’s acquisition criteria, selection committee, legally binding deposit agreements and undertakings to respect preservation and copyright imperatives, Langlois took an “acquire first, ask questions later” approach. A lot of the initial collection in the Cinémathèque Française was of questionable provenance, including prints that many believed were stolen, others that were separated from their owners during World War II (the original legal ownership such prints was ambiguous in any case), and probably even some purchased prints.

At the Cinémathèque Française, master prints were projected with little regard to the long-term preservation of what were, in many cases, the only surviving copies of culturally and historically

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significant feature films. Furthermore, Langlois' professional reputation suffered a major setback when a nitrate fire destroyed a large collection of films and associated documentation in 1959. Partly as a result, the organization was forced to resign from FIAF, largely because it was clear that it did not meet what had become (largely thanks to Lindgren) internationally accepted preservation standards. The only full-scale textbook on ethical practice in moving image archiving, published in 1998 by UNESCO, firmly endorses Lindgren's line, in asserting that archives "will not compromise the survival of collection material in the interests of satisfying short-term demand."<sup>7</sup>

Aprpos Langlois, Laurent Mannoni questions the generally accepted view of Langlois the visionary curator in concluding that:

But the Cinémathèque Française, during this period, was a reflection of the image of its creator: breathless, tired, perhaps even totally exhausted. Work on the collection was practically non-existent, there was no money for conservation or restoration, programming was chaotic, the Museum was forced to close for security reasons most of the time and frustrated historians demanded the creation of a genuine "Cinémathèque Nationale."<sup>8</sup>

Nevertheless, despite the fact that Langlois' emphasis on access was directly responsible for the permanent loss of many important films, history has tended to characterize him in a more favorable light than Lindgren—as the passionate, outreaching cineaste compared with the stuffy, Blimpish English civil servant.<sup>9</sup> Richard Roud's biography of Langlois praises his willingness to take "films out of cans and put them up on a screen where people can see them,"<sup>10</sup> whilst a review of Roud's book in a film studies journal concludes that what gives it "balance and integrity [...] is the author's focus on Langlois' activities as a film archivist who collects and exhibits films to the public as opposed to an archivist who just collects and stores them in a locked place."<sup>11</sup>

The tone of these responses is fairly representative of those from the public at large to archives that prioritize preservation first in order for the goal

of access to be safely carried out. Indeed, the Lindgren/Langlois debate has left a legacy of polarization between archivists and some of their core user bases, especially academics. Formally trained, professional film archivists—especially those who carry out preservation work—tend to see Langlois as an incompetent maverick whose activities raised the expectations of archive users who did not understand the technical justification for a robust preservation policy. They would argue that attempting to use the only known extant copy of a film for access purposes would be analogous to allowing users to handle the original Domesday Book or the Declaration of Independence and exposing the fragile documents to the harsh light of a standard office photocopier. In contrast, archive users and scholars in particular have received their professional training in an environment that emphasizes academic freedom and find being denied access to materials for technical reasons—or even more infuriatingly, because of copyright restrictions—intensely frustrating.

### Access Control in the Digital Era

The widespread rollout of digital imaging technology is, I believe, set to exacerbate this gulf. When domestic videotape recorders became increasingly popular in the early 1980s, much of the archives' former user base disappeared after rights owners sought to make new returns on their old investments by releasing preserved films on videotape. Furthermore, archive users could now record broadcasts off-air themselves and keep the recordings indefinitely (even if the legal right to do so was ambiguous at best). As David Bordwell and Kristin Thompson have suggested:

one effect of the massive accessibility of films on video has been to render archives less necessary for some purposes. As a result, the demand by casual users—e.g. "I want to write a paper on Marilyn Monroe and need to see all of her films"—has probably declined with the advent of videotape. Some archives may consequently consider devoting more funds to making films available on videotape.<sup>12</sup>

This is, of course, precisely what happened, though



An experimental sound film from 1925, available freely and instantly from the video sharing website YouTube. Despite the relatively low video and audio quality, the almost universal availability of this and other sites has raised expectations among researchers and the public. As a result of YouTube and other sites like it, they increasingly expect access to moving image archives to be universal, instant, online, and free.

in most cases, publication of video versions is carried out by the rights owners of films rather than the archives that preserve them. However, if one is implementing the Lindgren model of safeguarding preservation first and foremost before the video transfer can safely and ethically be made, back-end work needs to be done, such as technical selection, reconstruction work if necessary, and photochemical duplication to produce a new preservation master and viewing print. The increasing proliferation of media outlets has resulted in the prioritization of this work on commercially viable titles. For example, at the time of writing, all of Marilyn Monroe's films can be ordered in DVD form on Amazon for delivery within twenty four hours, compared to a much smaller proportion of, say, Simone Signoret's or Diana Dors's.

This has left archives with a primary user base of researchers who are seeking access to a more obscure body of material for which the level of demand is consequently lower. The chances,

therefore, of an archive denying access on the grounds that preservation copies have not been made is consequently higher. The most recent generation of digital imaging technologies, specifically the delivery of video through the Internet, has raised user expectations even further. One of the earliest collections of film material to be made available online was the Internet Archive, founded in San Francisco in 1996.<sup>13</sup> The film section's curator, Rick Prelinger, is a fervent supporter of the public domain (works no longer under copyright protection) and the concept of fair use (similar to "fair dealing" in UK and Canadian copyright law), which essentially holds that some reproduction for educational or critical purposes is permissible. Arguably the most prominent advocate of this position is Lawrence Lessig, a legal scholar who has argued for a substantial reduction in the scope and duration of copyright on the grounds that private ownership of cultural memory is fundamentally detrimental to the public good.<sup>14</sup> Using his extensive private collection of film prints

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and his knowledge of U.S. copyright law, Prelinger has built up a collection of more than 45,000 films that have fallen or been placed legally into the public domain and thus can be made freely available to download, view, copy and re-edit as the user wishes.

In the last decade, other major archive collections have been digitized for online access, often using public money. Examples include a selection of material from the Library of Congress, the British Pathé newsreel archive, and the British Film Institute's Screenonline project. And this is not to mention the mass of material that has been uploaded—most of it without permission—to public video sharing sites such as YouTube. This proliferation of online resources is continually raising expectations, creating a generation of researchers who are trained in the belief that any and all primary materials should be available, in some form, a mere Google search away—and that if they aren't, the archive charged with their care isn't doing its job properly. In short, the prevailing perception among researchers is that because, in terms of diversity of access, Langlois' vision of utopia is now—in theory, at least—technically achievable, any Lindgrenesque objections to its delivery are now emphatically invalid, even if the relatively few film scholars who actually understood the rationale behind those objections could be persuaded to grudgingly admit that at one time he had a point.

But however versatile, cost-effective and easy-to-use computer-based moving images are as access tools, there is no known medium for long-term storage of digital data that matches the performance of film for longevity and integrity. We know almost for certain that, stored in optimal conditions, film will last for several centuries.<sup>15</sup> In stark contrast, most digital data storage media won't even survive for a decade before chemical decomposition and/or format obsolescence takes its toll. Furthermore, the rationale for operating a policy that requires technical selection, reconstruction and photochemical duplication of master film elements to take place before a projection print or videotape copy can be made also applies to the process of digitization for access (as distinct from the use of digital intermediate technology as part of the preservation process). If

a film is not physically stable enough to withstand the stress from a telecine or datacine system or if the act of running it on such a system involves even a slight risk of inflicting further wear or damage, then Lindgren's principle still applies; no attempt must be made to digitize it until photographic preservation elements have been made. Major archive online access projects thus far have either relied upon collections that have already been preserved or have simply ignored the "preservation first" imperative and proceeded with digitization, resulting in projects that are effectively digital versions of Langlois' programming initiatives in the 1950s and '60s. The latter creates a hostile political climate, especially in dealing with funding bodies, in which responsible archivists have to argue for the time and money to do the job properly, because they are up against the short-term results delivered by those initiatives which have paid little regard to the long-term security of their assets.

Another aspect of the emergence of digital access technologies that puts archivists in a potentially controversial cultural gate-keeping role is that of technical authenticity. These technologies have, over the last two to three years, coalesced into two distinct categories: those in which the perceived image quality is the major technical imperative (notably professional origination formats such as digibeta and DVCAM, the DVD, its high definition successors and DLP projection in theatres) and those in which diversity of access takes precedence. The latter category is represented principally by the lossy compression codecs<sup>16</sup> used to compress the file sizes and bit-rates needed to represent full motion video when delivered in real time (streamed) over the Internet, such as MPEG-4, Flash, Windows Media and QuickTime. In the context of access to archival holdings, the process of preservation and restoration is often foregrounded in the context of the premium technologies. Nathan Carroll writes of a "new market for authenticity" in DVD re-releases of canonical feature films, which typically takes the form of mini-documentaries that describe the restoration process, "before and after" comparisons and the inclusion of ancillary material such as out-takes and trailers.<sup>17</sup>

At the other end of the technological spectrum, the emphasis on the curatorial work surrounding access is not on the technical authenticity of the



The other side to the digital coin is the marketing of much higher quality digital versions of archival film on offline media such as the DVD. The widespread use of terminology such as “digitally remastered” for marketing purposes (the implicit claim of which—that other DVDs are not digitally remastered—is technically meaningless, because the contents of all DVDs are by definition digital) risks creating the false and misleading impression that the preservation of archival film is quick, easy, and cheap.

footage, but on the cataloguing and interpretative work surrounding it. Describing a project to make a representative sample of the English regional film archives’ holdings available for online access, Frank Gray asserts that:

If we are beginning to imagine a new era for the moving image archives, central to this vision will be the development of on-line information and access and the correlated stimulation of research interest through relevant academic debate and publication. The Moving History on-line guide is only a step in the right direction; the real shift in consciousness will begin to take place

when a much wider selection of material from these collections begins to become available on-line and the potential for the creation of a UK on-line audiovisual catalog is recognized.<sup>18</sup>

Gray’s article emphasizes “information,” “research,” “debate” and “publication.” There is not one mention here of the aesthetic implications of providing access through selectively edited, heavily compressed, very low quality video representations of what in some cases are meticulously preserved 35mm originals. On the face of it, this is diametrically opposed to the formal “integrity” Edmondson presents as a central tenet of access: “An audiovisual archive will strive to present material in such a way that, as far as is now possible in practice, the audience is able to perceive and appreciate it in its original form, context and import.”<sup>19</sup>

Of course, the qualification “as far as is now possible in practice” allows virtually unlimited wriggle room for an archivist charged with negotiating the gulf between idealism and pragmatism, and digital access technologies were not the first to necessitate that negotiation. In their heydays, 16mm and VHS presented parallel dilemmas. But in the case of Internet streaming video, Gray’s vision is certainly the prevailing one, one that is largely accepted by anyone who is seeking access to the holdings of a moving image archive and is not primarily concerned with issues of aesthetic authenticity. This has provoked Paolo Cherchi Usai into predicting that we are about to enter a “digital dark age” in which the cultural relationship between origination and access technologies will be increasingly misunderstood and eventually disappear entirely from our historiographic understanding of moving image forms:

Digital culture has become the latest arena in which continues the old debate on what curatorial expertise should render unto Caesar and what to God. But surely an effort at specifying what its proper uses and limitations may be would put both sides of the argument into sharper focus. Much as we have learned to fight against those who would have us jettison altogether those frail

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and cumbersome artifacts called film prints, we should be no less adamant with those who reject all kinds of technological advance in the name of tradition and out of a misplaced sense of historical integrity. The issue cannot be defined either in terms of a blind utopian faith in what the future will bring, or in those of a purism so narrow that it rejects outright the intervention of electronics into areas where it has never existed.<sup>20</sup>

To what extent is it the job of archive professionals to set the terms of that debate in the context of curating and regulating access? Are we simply civil servants, acting on behalf of taxpayers and delivering what they ask for? Or do we take it upon ourselves to assume an ethical obligation to ensure, as far as is objectively possible, that technical and contextual authenticity is sought whenever our holdings are seen by the public? Should we attempt to prevent audiences from watching *Lawrence of Arabia* on YouTube on the grounds that only 70mm theatrical projection provides a truly authentic exhibition context if the alternative is that they would not see the film at all? The institutional environment in which public sector archivists operate is further complicated by their relationship with copyright owners, who in some cases are anxious to maximize the revenue-earning potential of their intellectual property assets (if they think they will make money by sticking *Lawrence of Arabia* on YouTube, then up it goes, whether the custodian of a pristine 70mm print likes it or not), while in others might wish to discourage or prevent their exploitation (a chemical manufacturing giant would probably not be keen on footage from its promotional film being used in a television documentary about environmental pollution, for example). My own feeling is that there is no “one size fits all” policy for tackling this challenge—after all, the one just criticism that could probably be leveled at Ernest Lindgren is that of dogmatism. But the evolving ethical framework in which archivists operate has to acknowledge the potential harm that can be and has been caused by succumbing to the cultural and political pressure for an “access at all costs” approach, one which both undermines the foundations of acquisition and preservation (to extend Edmondson’s building block analogy

and leads to that access being delivered in ways that obscure the technical properties of original artifacts.

## Conclusion

The original “debate” between Lindgren and Langlois—perhaps a full-fledged feud, since the personal animosity between the two is said to have been so intense that they were unable to inhabit the same room—has become film archivists’ shorthand for articulating the tensions between preservation and access. In fact, Lindgren’s belief that an archivist is justified in determining the circumstances in which an archive’s holdings can and cannot be made available was essentially restricted to two factors: the technical imperatives of preservation and the need to build a trusting relationship with copyright owners. For Langlois, prioritizing anything other than access first and foremost was “simply an impossibility.”<sup>21</sup> This legacy made him a hero among researchers, academics and programmers but also resulted in the irretrievable loss of several hundred feature films. Precisely how many we don’t know, because he didn’t undertake any meaningful cataloging work of the material lost in the 1959 fire, an occasion which highlighted the “twenty-five wasted years” in establishing a systematic preservation program for France’s moving image heritage.<sup>22</sup>

The significance of the advent of digital access technologies is that it has dramatically expanded the scope of the debate. The two emerging models of digital access technology—which can roughly be positioned as high quality/offline versus low quality/online—have pushed the issue of the representation of a film’s technical integrity to the fore. Should archivists take an active role in attempting to prevent the establishment of Usai’s “digital dark age” by making access contingent on the use of effective methodologies for relating original content to the technical form in which it is being presented? In other words, should they refuse to let *Lawrence of Arabia* be uploaded to YouTube, because doing so would give viewers a fundamentally misleading impression of how the film would have looked and sounded on its original release? Or should they stick within the limits laid down by Lindgren, and not worry about how

content reaches viewers, as long as the preservation masters are safe? Copyright, too, is another ethical minefield. Its implications for archivists are beyond the scope of this article, but as with the form of digital access technologies, they are being pulled in two directions. At the one extreme is the Creative Commons movement, which rejects the whole concept of intellectual property ownership as, in Usai's words, "an obscene legal construct for the furtherance of economic power,"<sup>23</sup> and have worked to place large bodies of archive film into the public domain through low quality digital representations (although this is out of technical necessity, i.e. the bandwidth limitations of today's Internet, rather than advocacy of a degraded picture quality), freely downloadable from the Internet. At the other, digital rights management (DRM) technology is increasingly being used to regulate and tie up access to the high-end content (defined both in terms of technical quality and commercial value of the intellectual property represented), reinforced by legal backing through legislation such as the Digital Millennium Copyright Act of 1998 in the U.S.<sup>24</sup> and the 2001 European Union Copyright Directive.<sup>25</sup> The direct use of DRM by archives is in its infancy. The British Film Institute's Screen Online website (<http://www.screenonline.org.uk>) blocks access to streamed moving image content except from within educational establishments

that have subscribed to it; this was necessitated by the BFI's agreement with the rights owners of much of the content involved, without which it could not have been used.

Could or should archivists seek to use similar forms of regulation in order to implement Edmondson's belief that access should preserve technical authenticity, or should they follow Gray's lead, concentrate on cataloguing and interpretation and accept that the issue of technical and aesthetic quality has effectively diminished in importance? Wherever the answer to these ethical questions may lie, there can be little doubt that digital access has served to widen the gulf between the demands of archives' users and the work of archivists in looking after the materials in their care. If it is accepted that the provenance, context, and perceived technical quality of moving images at the point of access should remain a cornerstone of archival methodology, and if it is also accepted that the back-end activities of acquisition and preservation are as important as ever in maintaining that methodology—both in spite of and because of the possibilities opened up by computer-based moving image technologies—then the archival profession needs to reassert its ethical values to access clients, funders, and rights holders in order to ensure that these technologies are a blessing and not a curse.

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#### Notes

1. Ray Edmondson, "The Building Blocks of Film Archiving," *Journal of Film Preservation*, no. 50 (1995): 55.
2. Gordon E. Moore, "Cramming More Components onto Integrated Circuits" (1965), reprinted in Mark D. Hill, et al, eds., *Readings in Computer Architecture* (San Francisco: Morgan Kaufman Publishers Inc., 2000), 56-59.
3. David Francis, "Challenges of Film Archiving in the 21st Century," *Journal of Film Preservation*, no. 65 (2002): 18.
4. Kerry Seagrave, *Piracy in the Motion Picture Industry* (Jefferson, NC: McFarland, 2003), 178.
5. Quoted in Ivan Butler, *To Encourage the Art of the Film: The Story of the British Film Institute* (London: Robert Hale, 1971), 72.
6. Penelope Houston, *Keepers of the Frame: The Film Archives* (London: British Film Institute, 1994), 44.
7. Ray Edmondson, *A Philosophy of Audiovisual Archiving* (Paris: UNESCO, 1998), 43.
8. Laurent Mannoni, "Henri Langlois and the Musée du Cinéma," *Film History* 18 (2006): 277.
9. As Houston remarks, "Lindgren himself was one of the few early archivists who was not by temperament a collector." Houston,

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*Keepers of the Frame*, 42.

10. Richard Roud, *A Passion for Films: Henri Langlois and the Cinémaèque Française* (Baltimore: Johns Hopkins University Press, 1999), 2.
11. Sachiko Shikoda, review of Roud, *A Passion for Films*, *Scope* (August 2001), <http://www.nottingham.ac.uk/film/journal/bookrev/a-passion-for-films.htm> (accessed 20 November 2006).
12. David Bordwell and Kristin Thompson, "Film Scholars and Film Archives," *FLAF Bulletin*, no. 45 (1992): 38.
13. See <http://www.archive.org/about/about.php> (accessed 20 November 2006).
14. Lawrence Lessig, *Free Culture: The Nature and Future of Creativity* (New York: Penguin, 2005).
15. This is "almost" certain because a minority of chemists dispute the reliability of Arrhenius, or accelerated aging, tests.
16. A codec (encoder/decoder) is the software that represents analog moving image forms as digital data stored in a computer or offline media. Most codecs use a technique known as *compression*, in order to reduce the volume of data storage (or, in the case of online transmission, bandwidth). This can take two forms. "Lossless" compression (e.g. M-JPEG) uses algorithms that reduce the amount of data needed to represent each frame, but without a proportional reduction in the resolution or bit depth of the images represented. "Lossy" compression works by losing elements of an image which it is believed the human eye would be unlikely to perceive during playback—for example, the sky in a landscape shot could be rendered as a single, uniform shade of blue (encoded with a "repeat this colour for X pixels" instruction rather than individual data for all the affected pixels). Most consumer and semi-professional digital video formats use lossy compression formats, such as DVD video (MPEG-2), QuickTime, RealMedia, and DVCAM. The extent of the compression applied can be varied in order to make a given media asset fit the space available. For example, if a two-hour feature film is compressed to fit on a DVD (8.5gb), the perceived image quality will be visibly higher than if it runs three hours.
17. Nathan Carroll, "Unwrapping Archives: DVD Restoration Demonstrations and the Marketing of Authenticity," *The Velvet Light Trap*, no. 56 (2005): 20.
18. Frank Gray, "Moving History: Promoting Moving Image Archive Collections in an Emerging Digital Age," *The Moving Image* 4, no. 2 (2004): 116.
19. Edmondson, *A Philosophy of Audiovisual Archiving*, 42.
20. Paolo Cherchi Usai, *The Death of Cinema: History, Cultural Memory and the Digital Dark Age* (London: British Film Institute, 2001), 121.
21. Houston, *Keepers of the Frame*, 50.
22. *Ibid.*, 58.
23. Usai, *The Death of Cinema*, 125.
24. For the full text, see <http://thomas.loc.gov/cgi-bin/query/D?c105:6:./temp/~c105QrtquO> (accessed 22 November 2006).
25. For the full text, see <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32001L0029:EN:HTML> (accessed November 2006).