"MIND AND SIGHT": VISUAL LITERACY AND THE ARCHIVIST

ELISABETH KAPLAN AND JEFFREY MIFFLIN

ABSTRACT: Contemporary culture is increasingly captured by and reflected in visual materials. Preserving and providing intellectual access to visual records will become an increasingly important aspect of archival work as such materials proliferate and are widely available in electronic form. Visual literacy, an evolving concept best defined as the ability to understand and use images and to think and learn in terms of images, is an essential skill for archivists and researchers using visual materials. Archivists of all media should strive to increase their visual literacy because of the complex ways in which visual and "traditional" textual documents interrelate. Archivists can approach visual literacy by becoming familiar with levels of visual awareness; participating in the ongoing discourse about the nature of literacy, including the relationships between visual and textual literacy; and increasing understanding of the special characteristics of image-creating technologies as well as the conventions and modes of expression associated with particular media. Expanded visual literacy will help archivists to understand and better describe visual resources as well as traditional documents and other materials of record. The results, improved finding aids and catalog records, will keep pace with anticipated expanding requirements of the research community.

Most archivists recognize that contemporary culture is increasingly captured by and reflected in visual and audiovisual documents, and that the proliferation of such materials presents new challenges to the archival profession. Archivists have demonstrated their appreciation of these challenges by organizing conference panels, workshops, committees, professional associations, and Internet discussion groups dedicated to exploring archival issues related to visual media. The concerns voiced in these forums have, with few exceptions, focused on understanding the physical aspects of the media for practical ends. Preservation techniques, scanning equipment and methods, and the technological manipulations needed for multimedia applications are among the most frequently discussed topics.

These efforts to deal with physical and practical aspects of visual materials are essential, but archivists should also devote corresponding attention to underlying intellectual issues. Case studies on use and interpretation of visual materials in specific historical and cultural contexts, examinations of the complex and shifting relationships between print media and audiovisual media, and focused explorations of the
technology and material characteristics of visual media in relation to their intellectual contents will become increasingly necessary as these materials come to constitute more of, and interrelate more closely with, the contemporary archival record.

An adequate knowledge base supports any practice, and understanding the characteristics of visual materials is crucial to archival practices such as appraisal, arrangement, and description. Furthermore, a level of competence and sophistication with the intellectual issues presented by a record's visual content is increasingly important for archivists of any medium. Contemporary, overlapping, and obsolete document forms are peculiarly interrelated. New materials of record require archivists to rethink their perceptions about concurrent or previously used document forms, and therefore to rethink their conceptions of archival theory and practice. "A new medium," as Walter Ong has observed, "transforms not only the one which immediately precedes it but often all of those which preceded it all the way back to the beginning."¹

Explorations of the present dimensions of literacy and its future are of increasing philosophical and practical importance. "What will be the intellectual character of the new society, [and what will constitute the] 'literacy' of its people?" asked the editor of a 1982 issue of Daedalus entitled "Print Culture and Video Culture." How should those who engage intensively with documents—archivists and historians, for instance—conceive of, cope with, respond to, and prepare for these changes?²

More specifically, how should archivists approach visual materials in an informed manner, or approach "traditional" materials with a knowledge of their relationship to visual materials? The declaration that this is a culture reliant on visual communication, and that all members of such a culture require a particular set of abilities for interpreting images, is by now familiar.³ How can archivists achieve a professional consciousness of these skills? Understanding the visual content of documents entails facility with a complex and little understood set of skills, described in this paper as "visual literacy." Visual literacy is essential for people bombarded by television, news photos, advertisements, digital images on the World Wide Web, and other aspects of our contemporary super abundance of visual stimulation. Yet how is visual literacy practiced? What individual skills does it require? Does it involve a solely interpretive set of skills, or has it an expressive component as well? How does it relate to other communications processes? Is visual literacy merely a component of human cognitive development, or is it learned, and thus tied to culture-specific conventions for communication? If the latter, then by what methods can it be taught? If visual communication is a form of "literacy," then to what extent can the dimensions of visual information be understood by analogy to language? By extension, to what extent can visual materials be understood by analogy to traditional textual materials? Whether archivists consciously consider these questions or not, they affect daily archival work. Whether they realize it or not, archivists who work with visual materials, even on an occasional basis, grapple with visual awareness on several levels.

Archivists, like others, will have to wait for a full understanding of the implications of visual materials. Additional research and additional hindsight are required. In the meantime, there are ways in which archivists can begin to gain an interesting and useful understanding of visual literacy issues. This paper serves as a preliminary articulation of questions about the nature of visual expression and interpretation, and a preliminary
application of those questions to the archival profession. It suggests that archivists will benefit from an increased facility with levels of visual awareness, and that such facility can result from investigation on at least four frontiers:

• an increased attention to the scholarship on history of literacy generally, as well as to the discourse on visual literacy;
• an increased awareness of the conventions or modes of expression employed by visual materials such as film, photography, and video, and the levels of analysis at which such materials can be understood;
• an awareness of how historians and others in related disciplines are facing visual awareness issues, and an exploration of the possibilities of collaboration;
• a review of the efforts of archivists over the years in relation to these issues.

The Evolution of a Concept

In a written text, perception, understanding, and expression of the building blocks and the ways of putting those blocks together are referred to as “literacy,” a set of skills traditionally associated with reading and writing. What, then, is literacy’s equivalent when it comes to visual materials?

Scholarship on visual literacy is best viewed within the framework of the larger literature on the history of literacy in general, which has enjoyed renewed attention since the early 1980s. At the risk of oversimplification, it might be stated that this literature redefines the concept of literacy from its traditional definition, the ability to read and write, to a complex set of shifting, evolving, overlapping communications processes; processes driven by changing technology, occurring in overlapping stages, and more complex than has been allowed in the past.4

An immediately striking feature revealed by a survey of literature on the concept of visual literacy is the variety of terms applied by scholars to the concept. The interpretive aspect of the process of “doing” visual literacy, by which visual information is mentally registered and processed, is described variously in the literature as “reading,” “listening,” “hearing,” and “decoding.” The expressive component, by which information is communicated through visual means, is described as “writing,” “speaking,” “composing,” “encoding,” and “uttering.” These terms imply a variety of approaches to the concept, including explicit analogies to traditional literacy, and careful attempts to sidestep that analogy.5

The term “visual literacy” was first developed and popularized in the late 1960s by John L. Debes, coordinator of education projects at the Eastman Kodak Company. Debes described his idea tentatively at first: “When I say visual literacy what I have in mind is a great dim shape, the outlines and importance of which are not yet clear.”6 What was clear, according to Debes, was that some sort of confluence of “knowledge, theory, and technology” was underway, embodied in a concept whose time had come. “I think of visual literacy,” he wrote, “as a great amoeba-like entity with pseudopods reaching out in many directions. I see those pseudopods labeled with the names of sources such as semantics, linguistics, philosophy, psychology, the industrial, vocational, and graphic arts, psycholinguistics, art, and screen education.”7
Debes convened the First Annual National Conference on Visual Literacy, held in Rochester, New York, on March 23, 1969, attended and sponsored by diverse groups including university and high school educators, English teachers, audiovisual instructors, art teachers, and representatives from Eastman Kodak, the University of Rochester, and Syracuse University. At the conference, Debes attempted a fuller formulation of the concept:

Visual literacy refers to a group of vision-competencies a human being can develop by seeing and at the same time having and integrating other sensory experiences. The development of these competencies is fundamental to normal human learning. When developed, they enable a visually literate person to discriminate and interpret the visible actions, objects, and symbols, natural or man-made, that he encounters in his environment. Through the creative use of these competencies, he is able to communicate with others. Through the appreciative use of these competencies, he is able to comprehend and enjoy the masterworks of visual communication.

By the mid-1970s, visual literacy ceased to be solely a concept, and became a self-described movement. Perhaps because it coincided with widespread concerns in the early 1970s about the impact of television on young children, and perhaps because experts in a variety of disciplines began simultaneously to recognize that contemporary culture is increasingly likely to be reflected in, captured by, or represented by visual media, the idea of visual literacy caught on immediately. In addition to the disciplines Debes foresaw as contributing to the discussion on visual literacy, scholars in education, art theory, film theory, history, film history, media and communications studies, sociology, and semiotics all began to address the topic. Some embraced the phrase and used it explicitly, while others grappled with the same issues, but for the most part rejected the term itself. By the mid-1980s, the volume of literature on visual literacy was enormous, and a number of newly established journals devoted considerable attention to the concept. Still, visual literacy continued to be plagued by foggy definition and inconsistent application.

A few voices noted that the lack of a consistent theory and definition of visual literacy was problematic, both for the entire discussion, and for its practical application. In an important essay summarizing the literature to 1982, instructional technologist John A. Hortin stated the problem in this way:

Many authors have mentioned sources for a theoretical foundation of visual literacy but failed to give a thorough analysis or satisfactory explanation of the theory and its link to practice. For instance, no one has satisfactorily explained the analogy between visual language and verbal language. We need an historical, analytical study of the philosophical origins of visual literacy.

Hortin continued, "it is necessary to know the meaning and theoretical foundations of visual literacy before one can use visual literacy effectively." In 1986 educator Richard Sinatra noted that:

The meaning of visual literacy has not been clearly defined in functional, realistic terms. This is undoubtedly due to the expansiveness of
the concept, the meaning of visual itself, the academic leanings of [those] applying the terms, and preoccupation with the forms and techniques of media communication... A major problem for visual literacy enthusiasts is that they have been using a catch-all term to mean anything that is delivered through visual sensory output.\textsuperscript{13}

The most recent attempt to formulate a theory of visual literacy is found in Paul Messaris's 1994 \textit{Visual 'Literacy': Image, Mind, Reality}, which draws from a range of disciplines to deconstruct assumptions that have accompanied the concept from the start. Messaris attacks the premises that visual images are arbitrary and culture-bound; that visual literacy (defined as familiarity with a visual language or grammar) is necessary for visual comprehension; and that visual literacy and verbal language are analogous. As he writes, “strictly speaking, of course, the term ‘literacy’ should be applied only to reading and writing. But it would probably be too pedantic and, in any case, it would surely be futile to resist the increasingly common tendency to apply this term to other kinds of communication skills (mathematical ‘literacy,’ computer ‘literacy’) as well as the substantive knowledge that communication rests on (historical, geographic, cultural ‘literacy’).”\textsuperscript{14}

Horton's 1982 proposal that “visual literacy is the ability to understand and use images and to think and learn in terms of images, i.e., to think visually”\textsuperscript{15} is probably the most useful definition to date, because of its simplicity, inclusiveness, and refusal to rely on the conventions of language for its definition.

In sum, the volume of recent literature devoted to visual literacy demonstrates that it is an idea whose time has come, while its meaning and application continue to evolve.

\textbf{The Need for Increased Awareness}

Those who appraise, arrange, describe, and provide access to visual materials must be able to understand and express by means of the written word the contents of the collections. These processes of perception and translation occur on several levels, and it may be useful to consider three such levels, with accompanying examples.

A first level of visual awareness might be described as an immediate or \textit{superficial} one. On this level, the viewer determines what a photograph, piece of film or video, or other material, is “of.” For example, when viewed cursorily, a sample of unedited campaign footage from the Robert F. Kennedy Film Collection at the John F. Kennedy Library depicts the 1964 New York Senate campaign and is immediately identifiable as images “of” Robert Kennedy, in various settings: greeting crowds in Harlem; speaking at a press conference at a midtown hotel; or riding in a convertible with Ethel Kennedy. A superficial look at Robert Capa’s famous still photograph of the D-Day invasion shows an allied soldier with rifle and equipment, hunkered down in the surf, drifting or crawling in shallow water. His face bears an expression of fear counterbalanced by determination.

On a second level, the Kennedy footage is “about” much more. “Aboutness” refers to \textit{concrete} subject content, and includes, for example, various aspects of politics and culture in the mid-1960s: standard protocol for political campaigns; minority and women’s participation in the political process; dynamics between ethnic neighborhoods
in American cities; New York City life, commerce, and architecture; and much more. The process by which the viewer perceives these subjects differs from that which occurs on the superficial level. The concrete level demands more complex ways of thinking about the images and requires specific historical knowledge of circumstances or events, participants, techniques, and more. The second level of visual awareness can also disclose more "about" Capa's 1944 invasion photo. Omaha Beach, on June 6, 1944, was raked continuously by machine gun fire from German pillboxes. The soldier was about to stumble into a dangerous melee, visible just ahead, littered with the bodies of maimed and dying comrades. The crossing had been rough. Fear is daunting. Courage is sustaining. And so forth.

Most archivists accept that an adequate level of specialized historical background knowledge is vital to the ability to process a collection. An archivist with appropriate background knowledge can recognize elements from the superficial and the concrete levels of visual perception and find ways to express them. Between general historical knowledge and research into the specific historical background of the materials, such information can be adequately perceived, translated, and conveyed in a finding aid or catalog record.

The third level of visual awareness is considerably more elusive. It has little to do with the superficial contents or the concrete subject matter of the document, but involves instead the perception of the document's purely visual, or abstract elements. These elements cannot be as easily expressed with words, and the perception of them entails an understanding of the realm of conventions associated with the visual. While the second level requires a sharp eye coupled with a measure of basic historical knowledge, the third level is distinctly more subtle, requiring the same sharp eye as well as a particular set of sensibilities and skills, and a knowledge base that, like facility with history and historiography, must be learned. This form of expertise requires sophistication with conventions and technology for both visual perception and visual expression; an understanding of the conventions of particular media in their particular context (e.g., television in the 1960s, political advertisements relating to a particular campaign, filmmaking techniques at the turn of the century, the evolution of nineteenth century still photography, etc.); an ability to critically dissect a document composed of elements such as time, light, sound, and motion; and an ability to translate these elements into a verbal description. Of additional importance is a level of awareness of other components of visual materials, which can include symbol, organization, ambiguity, space, sequence, rhythm, moment, and point of view, as well as historical contextual matters such as what the film's creators intended to express visually, possible expectations of original viewers, and possible perceptions of subsequent viewers.

Footage from the Robert Kennedy Collection can serve as one example. Archivists who experience (view, listen to) a document must understand the building blocks from which the document is constructed, and ask questions about the way the document uses these building blocks to communicate information. The building blocks begin with a vocabulary that includes such elements as camera angle, perspective, and editing techniques. Questions arise from an analysis of the vocabulary as applied to the particular document. Why, for instance, did the director choose to film Kennedy from certain angles? Why is the camera handheld at certain times and on a dolly at others? Is it
significant that the image is jerky at times, smooth at others? What is the effect of the swift panning of the vast crowd, and the effect of lengthy close-ups of individual faces in the crowd? What do those faces tell us, and how does the way in which they are filmed convey director Charles Guggenheim’s intention or vision? Guggenheim adapted to television cinema verité techniques borrowed from directors associated with the French New Wave. How were these techniques used to evoke emotion in the viewer? How do these techniques stand up over time? Are they ambiguous, even disturbing, or trite or formulaic ways of sending messages to viewers? To what extent is the viewer required to think actively about, and engage with, the images to understand them, and what will viewers, familiar with the conventions for contemporary visual communication, absorb passively?

Level three of visual awareness can also guide interpretation of Capa’s D-Day photo, raising questions as well as answering them, but in all cases leading closer to a fully informed perspective. Capa, for example, was a photographer who sold images to the press, whose reputation and career had been built upon action photos taken in dangerous situations. His invasion photos were intended for the broadest possible publication (newspaper readers in America, in unoccupied Europe, and perhaps elsewhere). His point of view as a socialist was one of sympathy with the common man. He took no interest in darkroom techniques, and generally considered his work done once he had frozen a newsworthy moment on his negative strip. Did Capa intend to emphasize the indomitability of the common man by pointing the lens down, and showing the soldier crawling or drifting, instead of charging, as heroes stereotypically do? Is the image blurred to suggest violent motion, or commotion, confusion, fear or because the photographer himself was partially submerged behind a steel fortification and may have been trembling from cold or fear? Were the negatives improperly dried and therefore blurry? Did Capa specially choose this man to represent so many others, or was his first choice lost when all but eight of his 106 Omaha Beach negatives were accidentally destroyed by a careless darkroom technician? What is the significance of his choice of camera, lens, focus, exposure, moment? What was he intending to express, and how were viewers likely to receive his photograph in 1944, and how today?

Possibilities for visually literate interpretation of an image, whether moving or still, are enhanced when the image is maintained by an archives in context with related materials. Images created by the same photographer help explain one another, as do related collections. The tremendous importance of photographer’s notes, for example, is illustrated by the practices of Dorothea Lange, whose habit was to summarize each day’s picture-taking in notes setting the context and recording short biographies of people depicted. Lange felt that half the value of her work was lost if pictures were not adequately documented by notes. “I don’t like the kind of written material that tells a person what to look for or that explains the photograph,” she told an interviewer. “I like the kind . . . that gives background . . . without directing the person’s mind. It just gives him more with which to look at the picture.” These vitally important written materials are what film historian Thomas Cripps has called the “paper trail.”

“Seizing the Light: the Appraisal of Photographs,” by Ballard and Teakle, attempts to outline some criteria for assessing the research value of photographs:

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The aim is to recognize the original intention of the photograph—its particular cultural use by particular people. This is rarely given within the picture, but is developed in its function or context. What was the purpose for the record being created, when, by whom, in what context? Photographs cannot be meaningfully employed unless... creator and context are understood. Visual literacy requires the same critical analysis as verbal literacy. Familiarity with the changing conventions of photography is essential to reveal the full meaning of historical images. Every photograph is altered in some way by the bias of the creator (intentionally or unintentionally), the nature of the apparatus, the film processing and printing and the unique interpretation...by each viewer. Photographic evidence of a particular event or location is often inaccurate or misleading because it is incomplete.

**Historians and Visual Awareness**

Some of the best insight into the nature of visual literacy comes from the field of history. Increasingly, historians have expended a great deal of effort exploring the possibilities of “reading” and “writing” with visual materials, and of teaching those skills to students. Their recognition of the importance to their discipline of visual materials has led to a substantial body of literature.

As early as 1924 Johan Huizinga’s magisterial *The Waning of the Middle Ages* called attention to the value of visual evidence in garnering historical insight. Huizinga saw nothing in “traditional” documents that illustrated the range of emotional experience that he knew (from art) existed in the late medieval period. He turned to different sources as a way of eliminating this blind spot, and in particular proceeded to analyze the paintings of the Van Eyck brothers and their successors. Van Eyck portraits, for example, often included a meticulous visual inventory of the sitter’s possessions, and clues to the sitter’s emotional state. Depiction of private space as a key to the state of mind of those who fill it became common in painting of subsequent centuries. Such portraits/interiors have, of course, more obvious and accessible uses for historians interested in objects used or displayed, and their relationship to space, and to people in the space. Photographs, being less subjective, and including a greater wealth of detail, are even more useful for purposes of historical understanding than paintings. As with other media, there are pitfalls in the interpretation of photography, which can be overcome to some extent by visually literate scrutiny and insight.

Until recently most historians have neglected non-traditional sources in constructing their theses. The pattern of research codified by Leopold von Ranke in the nineteenth century (historians should rely on original written records methodically analyzed and interpreted) still prevails, but many historians now want, in addition, oral histories, visual evidence, and other sources of information. The mid-to-late-twentieth century discovery of the photograph as a legitimate source may be related to an awakening interest in women’s history, minorities, the poor, and other topics less well documented by written records than the topics favored by previous generations of historians. (Still photographs have often been included in histories or biographies as illustrations in the
form of eight-or sixteen-page inserts of plates, but such inclusion has almost always been an afterthought, a visual bonus to attract readers and book buyers. Such images were supported by, not used as support for, the historical text, ordinarily based on traditional written documents.)

_Artifacts and the American Past_, by Thomas Schlereth, analyzes reasons why historians have so often distrusted or disregarded visual evidence and why many have yielded to a begrudging acceptance. The American Historical Association Conference in 1939 featured as a principal speaker Roy Stryker, who had engineered the Farm Security Agency’s concerted drive to document, with the camera, depression-era conditions and the effects of the government’s effort to alleviate them. Schlereth believes that Stryker’s session, “Sources and Materials for the Study of Cultural History: Documentary Photographs,” was a catalyst in the promotion of visual literacy for historians. He adds that the kinds of questions historians have traditionally asked:

have not been phrased in ways that photographic data can answer directly...as students of the word, with a large investment in careful verbal analysis, many historians...have tended to deprecate new types of visual evidence that threaten primacy of verbal communication.... To be sure, historical photography has significant limitations as historical evidence. Yet, after all the methodological rejoinders have been issued, all questions of veracity and representativeness raised, and all the problems of adequate citation and verification noted, historical photography still survives as an important evidential node enormously valuable to the historian...The historian must judge.

In short, the level of visual literacy of the researcher is an aid to interpretation and a possible safeguard against being misled.

Schlereth alerts researchers to a number of common pitfalls. “The camera,” he warns, “can lie, as often and as clearly as any other tool wielded by people intent on telling lies. And even...where the photographer is...honest...his picture will show only what the particular lens on the camera is capable of showing in the way of depth, clarity, and spatial relations...We would have seen more than what the frame or the exposure allows us to see. Cropping of a scene cuts off the viewer from other details that may well be relevant to an understanding of the picture.” The book discusses problems related to long exposures and historical photographic processes, and warns that manipulation can occur at every stage, regardless of era. Historians using photographic evidence must remember that photos are not a facsimile of total past scenes and events, but only a partial reflection of past reality. “Moreover, the photographer exerts enormous control over that reflection and the information and insight it conveys.” Of special significance is Schlereth’s advice that the negative, the primary source of photographic evidence, can seldom be altered without showing signs. The historian, therefore, should examine negatives whenever they are available for inspection.

Historians began to demonstrate an interest in the relationships between moving image materials and the historical tradition around 1949. This interest was first a German, then a British, and by the mid-1960s, an international phenomenon. One scholar has compiled a list of nine academic conferences devoted to history and film between 1968 and 1975, most of which took place in Europe.
Only gradually did historians in the United States begin to address the topic. Articles on issues relating to moving image materials began to appear in the 1970s in *Radical History Review*, the *Journal of Contemporary History*, *Oral History Review*, and in the American Studies literature. A 1982 article in the British *Historical Journal of Film, Radio and Television* proclaimed that “research and writing in…the field of documenting historical research through reference to films [is] growing. In the United States we are now coming into what might be called the ‘second generation’ of… historians with a bent for using films as documentation.” The author also observed, however, that this field was still far from the mainstream of historical research, noting that “the documenting of history through films [has] developed as [a] comparatively idiosyncratic” pursuit, and describing the individuals attracted to this form of research as “mavericks.”

But by the early 1980s, historical film reviews appeared regularly in the major historical organs in the United States, such as the *Journal of American History* and *American Historical Review*, and the mainstream professional organizations had begun to sponsor conferences on film and history, to organize committees on the subject, and to give annual awards to innovative historical work with film and video.

Previous generations of historians had treated moving image materials with reactions ranging from “bemused indifference to outright hostility,” as one observer has suggested.

By the time the *Journal of Contemporary History* devoted its entire July 1983 issue to “Historians and the Movies: the State of the Art,” the relationship of visual materials to history had become a topic of legitimate, if not widespread, interest among historians. As historian-filmmaker Nicholas Pronay observed,

> There...has been a noticeable change of attitude concerning the difficulties which this non-written record material presents for the historian, or indeed about the desirability of using it at all. [A] growing proportion of our profession came to consist of those who were already brought up in a society in which the moving picture, televised or projected, provided the primary form of communication...

Debates about history and moving image materials have centered around a set of issues that are never more than temporarily resolved. These issues include the legitimacy of moving image documents as historical evidence; the potential of moving image documents for portraying history; the necessity of visual literacy skills for historians and students; and fundamental concerns about the nature of images versus the nature of language.

**Visual Literacy and the Archivist**

Archivists, as well as historians, should explore the ideas behind visual literacy, and define visual literacy in practical terms applicable to archival methods and archival records. Though all participants in contemporary culture regularly interact with visual materials, the interactions of historians and archivists with these document forms are particularly ripe for examination because both groups engage intensively with documents on a professional basis and in a variety of complex ways. Furthermore, as has
been recently observed, the “perception of information [is] affected by its manner of transmission,” and this is a “critical issue for archivists.”

Surprisingly, neither library schools nor archival degree programs offer a special track for training visual resources specialists, and very little attention is devoted to visual materials in the general curriculum.\(^3\)\(^9\) “Guidelines for the Development of a Curriculum for a Master of Archival Studies Degree,” approved by the Council of the Society of American Archivists on June 5, 1994, do not mention a need for archival trainees to become oriented in the administration of visual resources.\(^4\)\(^0\) Nor did the Association of Canadian Archivists Education Committee make any specific recommendations about visual materials in its 1988 report, “Guidelines for the Development of a Two-Year Curriculum for a Master of Archival Studies Programme.”\(^4\)\(^1\) A 1993 report published in the American Archivist delineating important areas for education of future archivists and historians fails to mention visual literacy skills, though it does refer to “the inclusion of many new types of sources in archival repositories.”\(^4\)\(^2\) The 1994 issue of the American Archivist was devoted to a discussion of pressing current archival issues, upcoming concerns, and priorities for future research, yet visual materials were mentioned only in passing, indicating that these issues have lost, or perhaps not yet been accorded, the urgency they deserve.\(^4\)\(^3\) Nevertheless, the archival literature has for many years included references to the importance of the intellectual issues presented by abstract visual awareness.

In 1968, John B. Kuiper, as head of the Motion Picture Section of the Library of Congress, wrote in reference to moving image materials that archivists must first re-evaluate their traditional methods and, second, rethink their intellectual approaches in the wake of the proliferation of moving image documents. “Inevitably,” he wrote, “…as archivists…we must be concerned with…education…as well as with the problems of availability, cataloging, selection, and acquisition, although there is no doubt that these problems must also be given fresh treatment.” “We serve,” he wrote, “as the bridge between our collections and the clearer understanding of the century that our collections undoubtedly provide.”\(^4\)\(^4\)

Ten years later, archivist Walter Rundell’s groundbreaking article on still photography addressed the expressive uses of visual materials. Still photographs, first viewed as “adjuncts to literary sources and for display,” gradually came to be viewed by other scholars as “original sources themselves,” with expressive potential in their own right.\(^4\)\(^5\) Rundell’s article was important, in part, because it alluded to the uniqueness of the image as a mode of communication, and implied that new ways of understanding images, not bound by textual conventions, were in order. In addition, it demonstrated the ways in which modes of literacy overlap, and in which new modes are made to bear the conventions of older ones.\(^4\)\(^6\)

Several broad-based analyses of groups of photographs on related historical themes have been completed with satisfying results. Joan Schwartz, for example, examined the extant photographic record of British Columbia prior to its incorporation into the Canadian Federation, looking at many intersecting factors, including boosterism, attitudes toward the wilderness, the necessity for professional photographers to produce images they could sell, the difficulty of reaching remote locations with heavy equipment and chemicals, and the problems of depictions associated with limitation of the medium
during the period under study. She reminds historians using photographs as source material to always ask: who made it, who was expected to receive its message, and what was it meant to convey? She concluded, in part, that pre-confederation British Colombian photography focused on the alteration of the wilderness by humans rather than on the beauties of nature, due to both the emotional need of settlers to feel that they had recreated a home environment similar to that which they had left, and the desire to attract additional settlement. While the image itself can be analyzed for certain types of information, its use by a buyer can tell something else; for example, a mass-produced photograph of a famous sternwheeler or Indian village may be found in a photo album of the type commonly kept in a Victorian parlor.47

In 1979, Hugh Taylor reiterated Kuiper's suggestion that traditional archival methods be reevaluated in the context of new forms of record, and recognized that visual materials have their own special qualities and requirements quite separate from those of written documents. In "Documentary Art and the Role of the Archivist," an article on art objects (Canadian landscape paintings) as archival record, Taylor made several important observations that apply to the present discussion. He warned that "to those of us brought up on history written entirely from textual records, the written word has a certain respectability, a deceptive precision, a convincing plausibility that masks its limitations," and that "our literary training has often caused us to 'read' pictures 'literally' without being aware of certain rules and conventions that are in sharp contrast to the rules of alphabet, grammar, and syntax." In spite of this, he advised, "we must all learn to describe pictorial content in words if we are to retrieve it."48

The most recent and most ambitious attempt to address the intellectual issues attending moving image materials was the organization of a conference by the International Council of Archives, held in Ottawa in 1990, and titled "Documents that Move and Speak." Conference participants consisted of an impressive international array of archivists, librarians, and media specialists, and discussions embraced a broad spectrum of issues. Many participants advocated the need for archivists to expand their conceptual horizons in regard to the significance of audiovisual media. Jean-Pierre Wallot, National Archivist of Canada, noted that "the challenge confronting archivists is not just the physical aspects of moving image and sound documents, but also the intellectual aspects." He continued that "we should not conclude that the key questions confronting archivists in this area are simply questions of technology."49 Participants also noted the importance of studying new and changing media of record both on their own terms and within the context of older document forms and literacy patterns. "Moving image and sound documents should not be studied in isolation. They form part of the new information record of the twentieth century which will have an impact on all aspects of the archival profession. Thus, they must become part of a plan to assess the role of the archivist in this new age."50 Hugh Taylor continued in the same vein in his presentation at the conference, chiding archivists for not pursuing these issues further.

Archives are a subset of the whole communication process, and the media we use affect our individual perceptions and impact on society as a whole. As archivists we could have become aware of this since the 1960s through the works of Marshall McLuhan, Harold Innis, Walter Ong, and many others, but we have been slow to recognize this aspect in our search for
meaning and value. We were all reared for the most part on the heavy gruel of text.51

These calls to action have resulted in relatively little output in terms of archival research and publications, yet the problems persist. For a variety of reasons, attention to visual literacy issues will be a priority for archivists as the century draws to a close. Descriptive access, for example, may be the most important, most problematic, and least explored aspect of audiovisual archives administration. It is the point at which visual literacy skills become crucial. The translation process, entailed by providing descriptive access, confounds even seasoned audiovisual archivists.

Extensive description of visual materials is vital for preservation of documents and for ease of reference for researchers. Because of the physical difficulties presented by moving image collections in particular, researchers are extremely dependent upon access to preliminary descriptions of the materials, rather than to the materials themselves. As one film archivist observed in 1983, “Film cataloging is the least visible activity of a film archive. Yet, an accurate, professional description of both filmographic and technical information about the collections is the pivot upon which the other activities depend.”52 The substance of Clive Coultass’s 1976 diatribe on the importance of descriptive tools for moving image materials holds true today, though the practices he mentions are now dated.

It is impossible for any one person to view all of the [archives’] footage, and detailed information necessarily has to be provided by the subject index cards, shot sheets or other documentation, which can only go so far and might not adequately give an impression of the visual composition of a shot, or it can be obtained from one or other individual who has personally seen different parts of the collection. The danger . . . is that one senior film librarian may accumulate a great deal of knowledge himself and, even though he may transfer the basic details to the cards, he can be so harassed by pressure of demand and shortage of staff that his own intimate acquaintance with the collection is only sporadically passed on to his subordinates, themselves busy with day-to-day administration and with scarcely any time to look at film.53

Archivists need to be able to describe visual materials in terms meaningful to researchers with various levels of sophistication. Even an understanding by the archivist that there are several levels of visual awareness can provide for better description. Certainly, a description that goes beyond the first level of visual awareness, as discussed earlier, can be a great help to a researcher. If the finding aid can use the vocabulary of visual communication by briefly noting such aspects as camera angle, distance, and shot composition, so much the better. Though these terms may mean nothing to some researchers, they function as codes to others, who understand that such specifics are part of the “language” of visual communication, and can interpret them as such. “Medium-shot low angle pan of crowd faces with occasional close ups interspersed” means a great deal more to a visually sophisticated researcher than does “crowd scenes.” Without editorializing or imposing inappropriate interpretation, the former connotes an entire style of visual expression, places the document within a historical context of the genre, gives clues as to the intentions of the director, the
deliberate and the unplanned elements of the footage, possibilities for interpretation, and other considerations, while the latter reveals none of this content.

Heightened access to visual materials through multimedia databases will solve neither the visual literacy problem nor ameliorate the challenges of visual description. It may, instead, accelerate the urgency of the problems facing archivists. Such collections cannot benefit researchers if archivists do not possess the knowledge and skills necessary to provide adequate verbal descriptions of the visual contents of digitized images. Descriptive tools, such as catalog records and finding aids, will become increasingly important as visual documents continue to proliferate and as access to the images, or digitized representations of them, increases. As Alfred Willis wrote in the “Visual Resources” chapter of the Guide to Indexing with the Art and Architecture Thesaurus, “Computer technology has made possible the digitization of images, but attacking the problems of managing disembodied visual images in computerized image banks is a matter of urgent concern for visual resources specialists.”54 And, one might add, for all archivists.

Spurred on by the advent of image digitization, and by the general increase in volume of visual materials, efforts to improve techniques for providing descriptive access to moving image collections in particular have increased in recent years. These efforts have proceeded on three fronts: attempting to provide archivists with standardized vocabulary for describing the form and content of moving image materials; reaching consensus on the kinds of data to be included in descriptions; and providing means of sharing descriptive information from repository to repository. These three tasks are linked and interrelated: as the trend toward emphasis on data sharing increases, and as researchers’ expectations rise, standardization becomes imperative. Archivist Clive Cochrane summarized the problem, describing the current state of film archives in the U.K.: “Because of the different practices employed by archives and libraries, those working with moving image materials possess a variety of skills, knowledge and attitudes and no professional body plays a dominant role.”55 Nevertheless, impressive efforts have been made in these three directions by dedicated archivists and librarians in recent years.56

The “Visual Resources” chapter of the Guide to Indexing with the Art and Architecture Thesaurus lays out the theoretical issues underlying these practical problems eloquently, but offers no facile solutions:

Managing intellectual access to visual resource collections involves the coding or translating of the information inherent in those items, primarily information about the cognitive and/or aesthetic content of the subject depicted. The complex task of translating the information contained in images into words and other codes...is complicated by uncertainty about how human beings derive information from pictures and the differing intellectual and disciplinary perspectives of users. The difficulty of expressing certain qualities of pictures in verbal language is not necessarily due only to an imperfect command of the language, or to some kind of imperfect “visual literacy,” but rather to the real limits of verbal and visual communication themselves. It would appear that some qualities of the [image] are simply indescribable in words...These problems
are not ones of theory only... The problems associated with the disparate nature of what one can ‘see’ in a visual resource are mirrored by those associated with what one can say or ask about it as well. Researchers’ disparate questions about the images in visual resources collections drive the information retrieval function. In handling them, catalogers are reminded again and again just how difficult it is to specify in words what information is conveyed by a particular image.57

Archivists who do not possess a basic understanding of the history of the media of record, its technology, the conventions of visual communication, and the history of shifts in modes of literacy will experience additional (and unnecessary) difficulties in creating the tools needed to meet such challenges.

A Call to Expand our Role

Archives and archivists are well-positioned in the 1990s to provide some much needed grounding for the use and interpretation of visual materials: by playing an important role in promoting visual literacy; alerting researchers to possible problems in interpretation; and managing collections of visual materials more effectively.

Archivists should make a special effort to keep related materials together. On the most basic level, this means keeping together images that were created together. Subject access and cross-referencing can always be provided, but loss of context results in loss of information. Photographers’ notes and other complementary sources should be sought out, preserved, and made available. If donors of collections are asked a few extra questions they may well remember having seen notebooks or scribbled-upon negative sleeves or film cans somehow misplaced or otherwise separated from the images they describe.

Transferring an image to another repository is appropriate if doing so reunites a broken collection or enhances the usefulness of resources. Users should always be informed about the existence of other repositories with images relevant to their research, and this means that archivists must communicate among themselves.

Users of visual resource documents may benefit from the examination of accompanying archival materials, such as written notes, negatives, outtakes, unedited camera originals, and still photos, which permit them to see the processes by which choices are made, allowing far richer and more complete understanding of the documents than would be afforded by viewing the final product in isolation. Negatives, for example, are the part of a photographic record closest to what the lens actually saw and are difficult to alter without a trace. They should be available for inspection by users of a collection, and can often be viewed sufficiently without being removed from protective enclosures. Archives should keep a light box in the reading room next to the always available supply of white cotton gloves. Many researchers who use collections containing visual materials are familiar with such procedures and possibilities. Most archivists, however, are not prepared by education or training to recognize, understand, and convey information about visual communication on this third level and should take steps to upgrade their skills. Archives should maintain a shelf or two of reference books about the history of visual media, including details about technological change and
analysis of the social contexts of, for example, film or photography in various periods. Patrons should be made aware of these reference works and staff members should be given the time and encouragement to peruse them. (Of course, a thoughtful rejection of published conclusions is always a possibility.)

Archivists should learn what they can about the authenticity of images they accession through examining provenance and otherwise tracing the history of a collection. Ask donors, or creators, if possible: “How was it made, and when? Was it, or a related image, ever exhibited or published? Where was it kept? How did it come to you?” Increasing potential for high-tech image alteration will make such considerations especially important in the future.

Visual media are a stimulus to the memory and can be shown to knowledgeable informants as a way of opening them up in oral history interviews or when compiling notes on the history of a family, a town, a religious institution, a college, or business. The circumstances under which such recollections were preserved should always be noted as part of the record, including the catalog number or other identifying label of each aide-memoire.

Archivists should promote a symbiotic relationship with researchers, who, after all, have more time to focus undivided attention on details, and who often come to a project with some degree of subject expertise. Archivists can bring to this exchange of information their own special insights.

Above all, archivists should ask the right questions about visual collections and encourage patrons to do the same. Archivists need to be able to help researchers understand aspects of the collections that may not be obvious, or may be masked by misconceptions about the medium. We cannot afford to consider such skills the exclusive domain of film or photograph specialists any longer. All media, even traditional textual ones, can benefit from visually literate interpretation, and background on the conventions associated with communications media and document forms enhances archival work tremendously. With regard to visual materials, this understanding of the history of the media and their unique conventions is at the heart of the concept of visual literacy. Automation will eventually integrate the retrieval of all media, and the entire media spectrum may be retrieved in a complex search. Archivists should be prepared to guide researchers through at least some of the pitfalls and sources of confusion, providing information needed for balanced interpretation, explaining why images may not be what they seem.38

Archivists do not have to become experts in visual literacy, just as they do not have to become systems analysts or computer programmers, in order to appreciate the archival issues and challenges posed by textual electronic records. But archivists, as much as historians, do have a responsibility to become familiar with such challenges and issues in the documentary landscape. There are a number of ways in which we can enhance understanding of our collections and improve our practices. We can begin by attempting to understand levels of visual literacy, and upgrade our descriptions accordingly. We can peruse available sources on the technology and history of visual communication, and on the aesthetics of photography, film, and video. We can and should engage in the already active discourse on visual literacy, on shifting modes of literacy, on the
impact on our society of new document forms. Attention to these issues should be a required component of any archival education program.

Preservation policies presume that information contained in the documents is worth preserving. Making the informational content of archival documents, including visual materials, accessible requires the creation of adequate descriptive tools, in the form of finding aids, catalog records, and guides. The creation of such tools requires skills and a knowledge base that hinge upon thoughtful consideration of changing definitions of literacy, the possibilities and limits of translation, and the nature of communication through language and image. What is the worth of carefully preserved or digitally scanned materials if their informational content is not accessible to researchers?

Improvements in Dutch lens grinding in the late sixteenth century made available several innovations in visual aids, including improved spectacles and primitive microscopes, which attracted much attention as novelties. A northern European coin of the period circulated the following wisdom in the form of a Latin motto, worth considering today:

"Of what use are lens and light
To those who lack in mind and sight?"

As archivists, we shape the record of the past because, in part, we do serve as the bridges between collections and users. We are, as such, in a unique position to respond to the challenges posed by changing media, by the evolving nature of the documentary record. We can build better bridges. It is a big responsibility, but a fertile and promising endeavor.

ABOUT THE AUTHORS: Beth Kaplan is Assistant Archivist at the Massachusetts Institute of Technology. She studied filmmaking at the Massachusetts College of Art and received a B.A. in History and an M.A. in History and Archival Methods at the University of Massachusetts, Boston. Jeff Mifflin is Archives and Manuscripts Specialist at the Massachusetts Institute of Technology. He has an A.B., Harvard University, a J.D., Northeastern University, and an M.A. in History and Archival Methods, University of Massachusetts, Boston. Both authors are transplanted Midwesterners now living in the Boston area. The present article grew out of graduate papers prepared at the University of Massachusetts, Boston, and Simmons Graduate School of Library and Information Science. The authors would like to thank James M. O'Toole, Allan B. Goodrich, and James B. Hill.
NOTES

3. Consider, for example, Stephen S. Graubard’s observation that “we live in the century of the ‘moving image,’ but have only barely begun to consider the cultural and social implications of that fact” (*Daedalus* 114 (1985): v). This issue of *Daedalus* was titled “The Moving Image.” More recently, see “Visual Images Replace Text as Focal Point for Many Scholars,” *Chronicle of Higher Education*, 19 (July 1996): A8–A15.
5. In addition, the word “text” is applied in its traditional sense by some scholars to mean written or printed works, and in its deconstructionist sense by others to describe images, sounds, and virtually any other form of communication. Many scholars neglect to define their terms with confusing results.
8. Laverne W. Miller, “Some Thoughts on Visual Literacy,” *Choice* 22 (March 1985): 937. From this conference sprang the International Visual Literacy Association (IVLA), an eclectic interdisciplinary group that has met and published its proceedings annually since then. In 1970 Debes and Clarence Williams founded the Center for Visual Literacy at the University of Rochester.
13. To illustrate this point Sinatra cites a 1976 conference at which delegates were asked for definitions of visual literacy. “Analysis of the 62 definitions indicated that 52 different phrases were used to define the adjective ‘visual,’ and that 3 major meanings evolved for the word ‘literacy’ . . . .” Richard Sinatra, *Visual Literacy Connections to Thinking, Reading, and Writing* (Springfield, IL: Charles C. Thomas, 1986), 45–46.
20. Investigations in archives-related disciplines in addition to history will enhance archival understandings of visual literacy. Valuable insights can be drawn from work already done in such fields as art and film theory, art history, museology, and philosophy of art, all of which customarily discuss visual information in terms of interpretation, expression and analysis. In addition, the writings of artists themselves can be quite enlightening. This approach would of course entail the momentary setting aside of divisions between art and “non-art” materials, an act that could be instructive. As Hugh Taylor has written, “The line [between archival records and art] is by no means clear-cut and points up the dilemma of a culture that distinguishes art from record in an uneasy dichotomy.” Hugh Taylor, “Documentary Art and the Role of the Archivist,” *American Archivist* 42 (October 1979): 425.
present that necessitate blame Rosenstone, and history. 1976, Television close issue partial, established and Nicholas "18 Thomas Thomas (1983): secondary Television Local Monaco, "Research-In-Progress: "Visual History: The Craft of the Historian-Filmmaker," Public Historian 7 (1985): 53. In addition, Paul Smith has pointed out that "the criticisms...of film regarded as record can be levelled at other forms of source material: written and printed documents, for instance, may equally be partial, subjective, tendentious, emotive, and even forged. Nothing has been more curious in discussions of film's role in historical studies than the degree of suspicion directed against it by historians who are prepared to accept verbal material with far less critical apprehension...It is largely the comparative unfamiliarity of film, decreasing with each new generation of historian, which has earned it such suspicion..." Paul Smith, The Historian and Film (New York: Oxford University Press, 1976), 6.

33. Pronay, "The 'Moving Picture' and Historical Research", 366.

34. With continued attention at professional conferences, and with the publication of such landmark works as historian John E. O'Connor's American History/American Film: Interpreting the Hollywood Image (New York: Ungar, 1979) and American History/American Television: Interpreting the Video Past (New York: Ungar, 1983), skeptics could no longer deny the validity of the research value of moving image documents with their previous self-assurance. As O'Connor wrote in 1990, "In their various publications the contributors to this volume have been arguing for nearly two decades that historians should expand their horizons and begin to do justice to the study of moving images. Now it is time to press that issue further. There are important areas of historical scholarship where the researcher who ignores the close study of moving image evidence has failed to cover the subject; and the number of these areas is sure to increase in the future." John E. O'Connor, Image as Artifact: the Historical Analysis of Film and Television (Melbourne, FL: Krieger, 1990), 1ff.

35. Historian Arthur Marwick was convinced that moving images could not represent history, though they could help to enhance students' interest. "Film," he wrote, "...is not suited to the presentation of a complex historical narrative, and is most certainly unsuited to complex historical analysis" (Smith 1976, 153). In contrast, most contributors to the special 1983 issue of the Journal of Contemporary History agreed that no fundamental barrier exists between images and print for the presentation of history. When the December 1988 issue of American Historical Review devoted its "Forum" to the topic, four of the five contributors agreed that it is indeed possible to present legitimate history on film, and these four expressed a readiness to move on to a deeper analysis of the problem. As Robert Rosenstone, a pioneer advocate of the potential of history on film wrote, "I no longer find it possible to blame the shortcomings of historical films either on the evils of Hollywood or the woeful effects of low budgets, on the limits of the dramatic genre or those of the documentary format." At stake, as Rosenstone suggested, was a fundamental dilemma of historical definition, with vast implications for the discipline. Perhaps it was not the limitations of film that caused problems, but the limitation of traditional conceptions of history. "Can one really put history onto film," he asked, "...or does the use of film necessitate a change in what we mean by history, and would we be willing to make such a change?" His challenge is profound. Do the conventions of textual historiography (traditional conceptions of primary and secondary sources, stylistic customs, citations, bibliographies, statistics, etc.) enable historians to present history in its most objective and authentic form? Is it only through the use of such conventions that historians can present rich, complex, and subtle analyses of historical events or issues? Might
images permit complex analyses as well, using the conventions of visual, not textual, communication? Hayden White suggests that visual history (history presented by means of moving image media) represents a challenge to traditional history and historiography not unlike the challenge presented by feminist historiography: not only new answers, but new kinds of questions must be formulated, questions which ultimately require reevaluation of the entire framework of the discipline. Hayden White, “Historiography and Historiophoty,” American Historical Review 93 (1988): 1199.

36. “Visual literacy is an essential tool for citizenship in contemporary America,” wrote O’Connor in 1990. “It would be easy to teach students to be cynics (or to reinforce them in their cynicism), but this would be neither productive nor educational. Not long ago, the naïve presumption was common that whatever people saw on the news they accepted as fact. Today, people are so ready to disbelieve news reports, and especially news analysis, that ‘media bashing’ has become an effective political tool.” John E. O’Connor, “History in Images/Images in History: Reflections on the Importance of Film and Television Study for an Understanding of the Past,” American Historical Review 93 (1988): 1208. Training in visual literacy skills is essential for historians. Historian Daniel Walkowitz has argued that despite historians’ increased recognition of visual media as legitimate tools for writing and teaching history, the point of these efforts is if lost “neither historians nor their students have learned to ‘read’ images.” Daniel Walkowitz, “Visual History: The Craft of the Historian-Filmmaker,” Public Historian 7 (1985): 54.


46. On the latter point, see also Rosalind Thomas, Literacy and Orality in Ancient Greece (New York: Cambridge University Press, 1992).


52. Early archival writings on moving image materials acknowledge this fact. See, for example, the 1956 statement that “the more informative the descriptions are, the less the need to consult the film itself in searching. Frequent screenings of films for reference purposes is expensive, both in time and damage to films. Since archival holdings often include unedited films lacking narration or other documentation, the records description task of the archivist is a major responsibility. It is of the greatest importance that his descriptions be accurate, for finding aids not founded on careful research can bring discredit on him and his agency.” Hermione Baumhofer, “Film Records Management,” American Archivist 19 (July, 1956): 242. For a more recent statement, see Sheila Intner’s comment that “new
nonbook media materials…and increasing popularity of older media forms seems to indicate a need for more and better summary notes. Catalogers, who write them, need to accept responsibility for doing the job and getting the help they need to do it well.” Sheila Intner, “Writing Summary Notes for Films and Videos,” Cataloging and Classification Quarterly 9 (1988): 72.

53. Couttass, in Smith, The Historian and Film, 44.


56. Eileen Bowser’s 1991 comment that “At present there is no universal standard for genre and subject terminology” for moving image materials remains true in 1996. Eileen Bowser and John Kuiper eds., A Handbook for Film Archives (New York: Garland, 1991), 103. The major efforts to provide controlled vocabulary specifically for audiovisual materials include the Art and Architecture Thesaurus and Martha Yee’s Moving Image Materials: Genre Terms (Washington DC: Library of Congress, 1988). There are no universally or even nationally accepted standards for cataloging methods and no agreement on data elements for catalog records. See National Archives of Canada, Documents That Move and Speak (New York: K.G. Saur, 1992), 156. The now-obsolete MARC VM format and Wendy White-Hensen’s Archival Moving Image Materials: A Cataloging Manual (Washington DC: Library of Congress, 1984) provide the basic tools for feature film cataloging, but neither has been satisfactory for cataloging unedited footage. Both are at present undergoing major revisions. See Martha Yee and Linda Tadic, “Report of the AMIA Cataloging and Documentation Committee,” Views: The Newsletter of the Visual Materials Section, Society of American Archivists (9 April 1995): 4. Agreement on data element definitions and cataloging standards becomes increasingly important as multi-repository databases of descriptive information on audiovisual collections are expanded. At this writing, data sharing utilities for moving image materials include: local online film archives catalogs, which are accessible via the Internet; the national bibliographic utilities (RLIN, OCLC), which accept MARC VM records; and the National Moving Image Database (NAMID), conducted under the auspices of the National Center for Film and Video Preservation at the American Film Institute. NAMID’s goal is to serve as a comprehensive database of descriptive information about film and video holdings in the United States. These massive databases have a great potential, but as Roger Smither cautioned in an important article in 1987, “The cause for concern in the film archival world is precisely the fact that common standards for data exchange are being developed not only well after the perception of the usefulness of shared data, but also after the development of the first potential contributions to a global data base.” He continues, “The viability of data exchange depends on the consistency of the data shared.” He cites in addition “a tendency to assume that the introduction of new technology in some way automatically results in an improvement in services and circumstances. This is simply not confirmed by experience.” Roger Smither, “Formats and Standards: A Film Archive Perspective on Exchanging Computerized Data,” American Archivist 50 (1987): 329, 332, 333.

57. Willis, “Visual Resources.”


