
Navigator, Mapmaker, Stargazer: Charting the New Electronic Sources in Art History

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ABSTRACT

TWO ISSUES OF *LIBRARY TRENDS* have dealt with the developing technology for images and ways to index and access this information (Stam & Giral, 1988; Rorvig, 1990). This article discusses a related topic—the current developments in electronic reference sources for the history of art. The advances in automation and the proliferation of databases and projects are viewed in the context of the traditional focus of the discipline. This article describes the new literature in terms of the topics with which art history deals, with special note of the characteristic formats, and the organizations and institutions which have contributed to its development. A review of the currently available databases demonstrates the extensive coverage of art history by electronic sources and discusses their use for librarians and researchers.

INTRODUCTION

The literature of art history documents the production, collection, and study of art. The first books on art were published during the Italian Renaissance, and the writings soon developed characteristic genres. The models supplied by classical sources were important, and many publications on art from the fifteenth to nineteenth centuries were biographies of artists, treatises, and travelers' reports. There were also inventories and catalogs of collections, practical manuals, and "books of secrets" on materials and methods. Systematic studies in the discipline of art history came relatively late,

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commencing in the latter half of the eighteenth century. The growth of universities and museums, as well as the many exhibitions in the nineteenth century, stimulated the production of books and articles, and these have continued to proliferate during the twentieth century.

The early books were similar to modern art literature because they dealt with the same types of information. The data of art history are the names, titles, places, and dates which identify the art works. Theoretical works and criticism are important in the historical development of art literature, but the central concern is the work of art which is taken as evidence of culture. Images, artifacts, and symbols are art history's primary subjects. The discipline has a special expressive and documentary mode which is visual.

The focus on works of art creates the distinctive character of the documentation. Art can be an earring, a sketch, a painting, or an architectural complex. The historical dimension of the art works is the bearer of a changing aggregate of information. A painting may have been part of an altarpiece in a church which no longer exists, but now it is part of another altarpiece in a new church, or perhaps the painting was taken out of the church and sold and now it is in a museum. Good indexing of the painting supplies information on the artist, subjects depicted, medium, measurements, patrons, former collections, present location, any restoration work, and its frame. At first glance, information about art works is deceptively simple since it merely describes the physical aspect of the work. Following from the formal analysis, art historians assemble a complex set of related facts concerning the depiction and its meaning.

Art history has basic texts, such as *Le Vite (The Lives of the Artists)* by Giorgio Vasari (1550, 1568). However, unlike the fields of religion and English literature, the discipline has no canonical text like the Bible and Shakespeare to which scholarship continually reverts for reinterpretation and criticism. The corpora to which art historians refer and return to study are the works of art. Reproductions and descriptive physical information about art have signal importance to the discipline.

The formats of documentary materials on art have great variety. There are the usual books and journals, but art libraries also collect exhibition, sale, and gallery catalogs; artists' sketches; and architectural drawings. Occasionally falling into the category of works of art themselves, these materials have specific relevance to subfields of art research. Catalogs of auction sales, for example, are essential to research which traces the history of collecting and provenance of art works. Collections of art literature contain an increasing range of formats. These include original editions and artists' books and prints, in addition to facsimile editions, video disks,

and CD-ROMs. Multimedia sets include texts, images, and objects. Sometimes a set of documentary materials has the appearance of a box by Marcel Duchamp. Other typical formats include slides, picture files, photographs, videos, audio tapes, microfilms, and fiche. For integrated research, good access to various types of materials and formats is important.

Foreign language materials form a substantial component of the literature. Art history is a product of the European academic tradition, and its texts and documents are studied in the original languages. A final feature which broadens the scope of art historical resources is the interdisciplinary focus of research. The subjects of art history are characterized by the elastic nature of the categories and kaleidoscopic combinations. This includes the scholarship of professional art historians and that which is produced by other researchers whose subjects deal with art. All of the persons referred to in the title of this essay come from fields outside the humanities. However, the literature of voyages and travels, astrology, and geography have a traditional association with art history. These auxiliary subjects are examples of fields which provide profitable excursions for art historical research, and the professions themselves are emblematic of how librarians and researchers can extend the boundaries of scholarship.

The new electronic publications reflect these traditional characteristics of art literature. Compared with older formats, the automated sources are flexible and efficient. Even in their first incarnations, they allow for greater ease in searching. They provide better linkage between diverse types of literature and supply assistance with the variations which foreign language materials bring to scholarship.

CURRENT PROJECTS AND DATABASES

The most recent decades were a period of creative thought and independent development of databases on art. In 1988, the *SN/G Report on Data Processing Projects in Art* listed almost 250 automated projects of various types; these included databases for institutional collections, typological corpora, and inventories of monuments. There are a surprising number of important reference sources which are generally available. Several have overlapping coverage; two of these have combined forces recently to become one greater index. Many smaller databases were created which describe collections or list limited subject areas. Others were created only to generate a printed document. A problematic development of this fertile period were the databases with similar types of information produced in incompatible or inaccessible formats. Lutz Heusinger's (1989)

comment about video disk projects which either failed or are not for sale is: "How many art-historical books one could have printed and given away as presents with the money spent on these discs..." (p. 16). One could say that these projects were useful as stepping stones in the evolution of electronic sources. These sorts of projects have not been described here since they represent an immature stage, and they are discussed in other publications.

In this period, there were dreams of systems with powerful capabilities that would store and access data in many subject fields and various formats. These visions were based on the successful mounting of shared files of bibliographic data by OCLC and RLIN and the establishment of online search services in institutions of higher learning. Indirectly, the ideas of enhanced systems also came from the need for increased security. This required good accessible descriptions of materials for better control of collections. "Automation...allowed vast quantities of data to be stored and retrieved easily and cheaply, and there was the promise of relational databases in which scholars could link a variety of information within one system" (Petersen, 1990, p. 645). However, when the prospects of the utility of common software and shared access to database management systems and files were examined carefully, it was evident that the incompatibilities of both users and formats made for difficulties which would need to be addressed.

During the 1980s, major projects emerged and gelled. Especially in the case of libraries, the values of cooperation in the creation and use of shared files, and the reasons for use of consistent descriptive terminology for names, art works, and subjects were recognized. When financial resources became scarce, the values of cooperation and collaboration became self evident. It should be noted that, compared to museums, libraries found it easier to cooperate and share information.

In an article summarizing the development and results of the Museum Prototype Project, Allen (1988) brought up some of the differences among the types of research collections and corresponding activities in the field of art which libraries and museums sustain. While libraries have always had a strong tradition of cooperation, museums have developed as autonomous collections. The genesis of museums was often as private collections or endowed foundations, thus, by nature, they stressed an individual approach to the operation of a collection. The typical museum staff is a mix of art historians, professionals with business and administrative backgrounds, artists, educators, conservators, scientists, and editors. All bring different research backgrounds to their work with collections. Library staff tend to be a more homogeneous group. Art libraries tend to contain

similar collections of books and periodicals. They do shared cataloging of their collections, creating and using records in online bibliographic systems like OCLC and RLIN. By contrast, museums collect unique objects and keep unique files on them; museums tend to have unique ways of describing objects. Unlike the author, title, and imprint of books, the basic information about museum pieces, such as artists' names, titles, date, and material, is not contained or inscribed on the objects. In the past there has been comparatively little standardization for object descriptions. Foreign languages bring additional problems of different definitions and historical usage which compound the difficulties of shared files. This is particularly true when the things to be described are elements of historical national patrimony, and the project is supported by official sponsors such as the Canadian Heritage Information Network (CHIN), the Museum Documentation Association (MDA) in the United Kingdom, or the Inventaire Generale des Richesses Artistiques de la France (Allen, 1988, pp. 191-92).

Most of the electronic sources on art which became available during the 1980s were based on printed reference books. These were indexes published by professional associations, academic institutions, and commercial publishers. Unlike reference works and research tools in certain other disciplines of the humanities, art indexes have been well supported, and these sources have improved steadily since their electronic inception. There are several general indexes for art as well as sources for architecture, photography, and conservation. Distinctive formats, such as auction sales catalogs, are represented in special databases.

The most notable example of a cooperative endeavor is the long-awaited marriage of the two major indexes to current art literature—RILA, the *Répertoire international de la littérature de l'art* and RAA, the *Répertoire de l'art et d'archéologie*. Conceived at an international conference on art bibliography sponsored by the College Art Association in the early 1970s, RILA was one of the first projects of the Getty Art History Information Program (AHIP) which took over its support in 1982. Since 1985, RILA's entire file, from its first volume published in 1975, has been available through DIALOG.

The *Répertoire de l'art et d'archéologie* is one of the oldest art indexes. It began in 1910 as a very small publication that simply listed journal contents. By the 1970s it was one of a group of publications on art and archaeology supported by the French Centre National de la Recherche Scientifique (CNRS). While RAA indexed literature on Western art from the early medieval period to the present, the other indexes which were part of the FRANCIS-H group covered art in other regions (FRANCIS-H stands for *Fichier de Recherches*

Bibliographiques Automatisées sur les Nouveautés, la Communication et l'Information en Sciences Sociales et Humaines). The printed versions of these indexes were part of the larger *Bulletin Signalétique* series. *Bulletins Signalétiques* with online files pertaining to art are 525: Préhistoire et Protohistoire and 526: Art et Archéologie, Proche-Orient, Asie, Amérique. The RAA is file 530.

The first volume of BHA (Bibliography of the History of Art), appeared in 1991 after more than five years in development. It begins with coverage of 1989 publications and has superseded RILA as file 191 in DIALOG. For searches of earlier literature, DIALOG can be used for RILA, and the FRANCIS database distributed by QUESTEL gives access to almost two decades of RAA back to 1973. BHA is published jointly by the Institut de l'Information Scientifique et Technique in Paris and the Getty Trust. Although their publications are similar, the two sponsoring organizations are quite dissimilar, expressing the different ways in which art and scholarly projects are funded here and abroad.

In France, the Institut National d'Information Scientifique et Technique (INIST) is a part of the state supported CNRS. The INIST is a center of documentation and a library where the indexing is done on the FRANCIS databases. RILA and the BHA are projects of the Getty Trust's Art History Information Program and are produced at the Sterling and Francine Clark Institute in Williamstown, Massachusetts. While RILA in its earlier format was really a computer-assisted print publication, the BHA was designed to function as a database, although its present use is primarily in print rather than online. It features a completely bilingual (French and English) vocabulary, subject to rigorous authority control, which is used to index the citations by keywords and index strings (Rinehart, 1990, p. 135).

The Bibliography of the History of Art indexes all types of literature about art—books, exhibition catalogs (but not sale catalogs), conferences and other collections of essays, microforms, machine-readable data files, and about 4,000 journal titles. Most of the citations have brief abstracts, a helpful feature in a subject field known for allusive titles. While there was substantial overlap among the citations included in RILA and RAA, BHA has twice as many citations as the earlier indexes. BHA combines the subjects covered and chronological range which was shared by its parent indexes. Reflecting traditional art history, the focus is on Western art from late antiquity to the present. Along with the exclusion of Greek and Roman art, BHA does not cover prehistory or Oriental, Islamic, African, Oceanic, or Native American art.

ARTbibliographies Modern (AbM) takes a different perspective of the current literature. Its indexing concentrates on modern art,

particularly the fields of art, design, and photography. It lists both books and articles; since 1988, architectural subjects are not covered. The online files reach back to 1974. Given the expanded and strengthened state of bibliographic coverage supplied by BHA, one wonders if this index is worth producing. How much would AbM be used if it were not part of DIALOG's cleverly conceived one-search strategy for "ARTS" which encourages the use of several databases (possibly more than are actually needed) in the course of a single search strategy? AbM has a lively multicultural bent because it includes the arts of Asia, Africa, Oceania, and other regions excluded from BHA. Very recently established journals are indexed, so the references are particularly good for contemporary work and new trends.

The journals covered by Art Index (from 1984 to the present) span the fields of fine arts, architecture, archaeology, museums, crafts, and photography. Its strength lies in its general coverage of the leading journals and museum periodicals. In deference to the importance of European publications in the field of art, the Art Index includes foreign language sources. It is the only Wilson index which indexes foreign language materials. It omits books and scholarly, but arcane, publications like dissertations and Festschriften. Academic art historians have shunned Art Index, dismissing it for the limited coverage it provides. However, this is a hasty generalization which overlooks Art Index's main purpose which is the utilitarian popular emphasis characteristic of all the Wilson indexes. A recent study at the Avery Architectural and Fine Arts Library of Columbia University compared the use of the paper and CD-ROM versions of Art Index. It confirmed the index's efficiency for ready reference searches using incomplete citations and for locating book reviews, reproductions, and reviews of exhibitions. Art Index is equally useful for initial searches of topics and for current articles not yet listed in other sources. The respondents to a questionnaire distributed during the study favored the CD-ROM version of Art Index because it was a cumulative source. Researchers no longer want to go through a series of annual paper volumes. They indicated that it was faster and convenient because they could print out their search results. CD-ROM searching was termed "fun" by some users. They liked the fact that many access points were offered and could be combined in the searches (Sykes-Austin, 1991, pp. 14-17). Art Index provides access to a selection of more general art periodicals. It serves the public interest in the arts and is useful as a step up from the platform of *Readers' Guide* to more specialized literature. The index is available in three modes—paper, CD-ROM, and online.

Art & Humanities Search (AHS) is published by the Institute for Scientific Information (ISI). Its format is similar to the Science

and Social Science Citation Indexes. AHS's strong points are also its weaknesses. Although its integration of the arts and humanities stresses a broad interdisciplinary approach to research, the structure of sources, citations, and Permuterms[®] is complex. It requires a knowledgeable expert searcher to use it effectively. The printed format of AHCI (Art & Humanities Citation Index) with its awkward Permuterms[®], brief author cites in the Permuterm[®] volumes, and truncated versions of the lengthy art-historical titles, makes it so unfriendly to novice users that they are hardly led on to searching the computerized version. This is unfortunate. Since it was designed as an electronic source, use of the online version is much more rewarding and even stimulating for research. On the plus side, the format of AHS's listings of source citations elicits patterns of thought and related authors whose works might also be of interest. At the moment, one needs to be either very interested in searching or a sophisticated searcher to take advantage of these capabilities. However, the ISI will be releasing AHCI very soon on CD-ROM. ISI indicates that it will be easier to use than the online version because of improved software with user-friendly menus. Because of its broad range of humanities coverage, AHCI on CD-ROM should be interesting and profitable to search and to browse without the pressures associated with online searching.

Architecture is often viewed as a subfield of art, yet it is the most comprehensively covered by electronic sources. The Bibliography of the History of Art and Art & Humanities Search include publications on architecture, Art Index covers more general articles, and two more files, representing extensive coverage from slightly different points of view, are both available in DIALOG. These are the Avery Index and The Architecture Database. Both provide citations on world architecture with overlapping coverage in the area of periodicals. Produced by the British Architectural Library at the Royal Institute of British Architects (RIBA) in London for its constituency of scholarly users and practicing architects, the Architecture Database grew out of that library's printed lists—*Architectural Periodicals Index* and the *Books Catalogue of the British Architectural Library*. The database includes books as well as periodicals from 1978 to the present and not only current publications. More than 2,000 descriptive records of early books on architecture from the library's Early Works Collection were recently added to the file. The RIBA library has a stellar collection of early treatises, pattern books, and building manuals, travel and guidebooks, and other rare works which are important to architectural historians. So this retrospective file is a useful addition to the files of current literature. Another feature of the Architecture Database is the British Architectural Biography 1834-1914. Continuing the coverage

provided by H. Colvin's *Biographical Dictionary of British Architects 1600-1840* (1978), the database stores information on British architects drawn primarily from the RIBA collection of Nomination Papers. These were completed by all prospective members of the RIBA from its establishment in 1834. The project was funded by a Getty Grant, and it is one of the first biographical sources on art to become generally available online.

The Avery Architectural and Fine Arts Library at Columbia University is the leading architectural collection in North America. The periodical indexing in the Avery Index is produced from the Avery collections. Currently, the Avery files are available in both the RLIN system and through DIALOG; a CD-ROM of the database is about to be released. Based on its printed precursor, the Avery Index to Architectural Periodicals, the index covers only journal publications on world architecture. The library's book holdings were published in the *Library Catalog of the Avery Architectural Library*. This is supplemented by new listings in the RLIN bibliographic files.

The AVIADOR (Avery Videodisc Index of Architectural Drawings On RLIN) project is a parallel effort to provide comprehensive integrated access to the Avery library's collections. Records for the library's architectural drawings collection are listed in the RLIN VIM (Visual Materials) files. The project runs on a personal computer connected to the RLIN system; an RLIN program links the text to 45,000 images stored on a video disk. Architectural drawings are important sources for architectural history, particularly for research on individual architects, designers, corporations, and official building projects. With the implementation of the AVIADOR project, the Avery library took the first step in creating links between descriptive texts and images. Although its name evokes metaphors of flight, Angela Giral's (1988) article on the project's implementation brings to mind an intellectual exercise equivalent to the challenges of a white-water float trip. Her account of AVIADOR is illuminating for an understanding of the debates and discussions which surface when bibliographers go beyond books. Materials like architectural drawings require specialized descriptive terminology and cataloging practices which provide appropriate access to their characteristic features and formats. Presently, two consortia of institutions, the Architectural Drawings Advisory Group and the Foundation for Documents of Architecture, have developed guidelines for the description of architectural drawings and collections. These are scheduled for publication in 1992.

In comparison to fields which are bereft of electronic sources for reference and research, access to information on architecture is very good. However, as in art history, the indexing is somewhat redundant in the area of current periodical literature.

Another type of serial publication is covered by RILIN's special database for auction sales catalogs, SCIPIO (Sales Catalog Index Project Input Online). Unlike a periodical index which analyzes the contents of individual issues, the SCIPIO records account for sales catalogs in terms of holding institutions. Users may search by the names of auction houses, sellers and collector's names, dates of sales, and title words of the auction catalog. SCIPIO is not a guide to sales but a union catalog which reflects the library collections of its members. The Art Institute of Chicago, the Cleveland Museum of Art, and the Metropolitan Museum of Art were the original members of the SCIPIO project. Among other participating libraries which are now part of the project are the National Gallery in Washington, the Nelson-Atkins Museum of Art, the University of California at Santa Barbara, and the Getty Center. Unlike most of the tools discussed here, SCIPIO is an excellent retrospective source; records in the database go back to catalogs published in the seventeenth century. SCIPIO's files are used primarily for advanced research in the field of provenance, assisting researchers who pursue the movement of art in collections and on the art market. Provenance work provides authentication and sheds light on the persons who collected art. The database now includes over 110,000 records for sales catalogs. It is a comprehensive source for a category of publications which has fallen through the cracks between books and journal literature. Although it was designed as an automated file, SCIPIO's only drawback is that its records are not in MARC format. In considerations of building integrated catalogs which list all types of materials, the intractability of the SCIPIO records poses problems.

Tracking sales on the art market, ArtQuest is an electronic source which analyzes the contents of auction sales catalogs. The ArtQuest service provides online access to the ASI Databank of international auction sales. Coverage is best for two dimensional works sold at auction since 1970; sculptures and three dimensional works have been added from 1983 to date. It should be kept in mind that this database includes only auction sales. Art is sold through dealers and private sales; it occasionally moves into museums and public collections by donation. Available through Pergamon Financial Data Services, ArtQuest corresponds to the printed version of *Art Sales Index*. For individual searches, requests may be made to ASI's Enquiry Service. Another ASI databank, STOPICS, lists stolen art works and is available to the international police and *ArtQuest* subscribers. The Canadian Heritage Information Network (CHIN) has a similar online database—the Register of Stolen Art and Artefacts produced by Interpol Ottawa.

Preservation and conservation have received recent attention; however these are not new fields. Reference indexing of the literature

dates back to *Technical Studies in the Field of the Fine Arts* which were published by the Fogg Museum at Harvard from 1932 to 1942. The publication was continued by the International Institute for Conservation's (IIC) *IIC Abstracts*. The latter became *Art and Archaeology Technical Abstracts (AATA)* and were published by the Conservation Center of the NYU Institute of Fine Arts for the IIC. In 1983, the Getty Museum took over responsibility for the abstracts, and two years later the project was passed on to the Documentation Program of the new Getty Conservation Institute. Now the *AATA* has been subsumed into the greater data banks of the Conservation Information Network (CIN). Subscribers to the network have access to a number of files. These include retrospective indexing loaded from the earlier volumes of *IIC Abstracts* and *AATA*. This bibliographic database includes the holdings of the world's largest collection on conservation at the International Centre for the Study of Preservation and Restoration of Cultural Property in Rome. It lists materials from several other large conservation collections at the Canadian Conservation Institute, the International Council on Monuments and Sites (ICOMOS), and the Conservation Analytical Laboratory of the Smithsonian Institution. In addition, the Conservation Information Network has a materials database with information on commercial products, a suppliers database, and the National Library of Canada's Photographic Conservation Universal Decimal Classification System database. The network runs on the computer systems of the Canadian Heritage Information Network which provides technical support. The long and varied life of this conservation index is its own testimony to the persistence of interest in preserving culture. The CIN is an extraordinary cooperative effort to share information by all the institutions which contributed to the development of the network.

Many institutions' library catalogs are now available through Internet. The George Eastman House Interactive Catalog is a similar application which is an extremely useful reference source for the history of photography. The Eastman House in Rochester, New York, is the first museum to allow access to its collection via modem. Using an interactive video disk, it is possible to display images from the collections. The catalog is accessed through the University of Rochester's computing center. The online catalog corresponds to the *Index to American Photographic Collections*, edited by Andrew Eskind and Greg Drake (2d ed., Boston, 1990). However, the interactive catalog provides more information, including recent additions to the files. The catalog supplies biographical notes on makers, bibliographic references, subject headings, exhibition histories, and information on the holdings of other photographic collections. Like

the printed edition, the catalog provides the names, addresses, and contact persons at other museums.

To survey the coverage of art reference sources is useful because it charts the course of art literature. In most cases, literature indexes make a conservative selection which determines what is read and what is collected by libraries. It is no surprise to find that the standard publications on Western art history are well covered. This is the canon for art history and one expects to find good coverage in what is considered polite scholarship. While the two indexes which have become the new *Bibliography of the History of Art* were very similar in coverage, lacuna still exist. These correspond to the exclusions from BHA. It may not be surprising to see little access to non-Western culture groups in the art history indexes, but what is astounding is the dearth of electronic indexing for literature on ancient art. While there are three printed indexes covering classical art—*Archäologische Bibliographie*, *L'Année Philologique*, and *Fasti Archeologici*—none is available online. Art Index provides some general listings for the period, and the indexes for architecture cover ancient buildings and monuments. Recently the Library of the Deutsches Archäologisches Institut in Rome, the source of the *Archäologische Bibliographie*, released DYABOLA. Covering publications from 1956 to the present, it is a subject index to ancient studies with a focus on archaeology. The programs are multilingual, and users may opt to search in German, English, French, or Italian. DYABOLA is available by subscription on disks which can be used on a personal computer.

In the wake of creating specific database applications, there were more global visions of integrated resources to provide both facility and greater compass to the art historian's ability to search for information. What was needed was a common language. This was the genesis of the *Art and Architecture Thesaurus (AAT)*, a hierarchically structured list of terms used to describe art. The endeavor was "to construct a language that would represent knowledge in the field of art and architecture as well as be surrogates for the images and objects being described." By providing a hierarchical structure for the vocabulary which indicates how to find ideas and images, "it was designed to provide the 'hinge' between the object, its images, and related bibliographic material" (Petersen, 1990, p. 644).

The success of the *AAT* project proved that technology does not have to be seen as a limitation on vocabulary. Quite the opposite, it structures thought and furthers research, thereby providing rigor to the use of words in context. A thesaurus could be seen as just a list of words, but the *AAT* is a far more important endeavor—to map the *mentalités* of Western art history at the end of the twentieth century. The open-minded discussions which characterized the

participative development of the *AAT* have given the thesaurus a leading role in the world of machine-readable databases. *AAT* is currently used by a growing number of indexes, libraries, and projects, including BHA, the Avery Index, the Conservation Information Network, many art and museum libraries, archives, and visual resource collections. Although it was developed to be used online, the *AAT* is available in print, on disk, and in RLIN.

The many different art organizations which needed to share and use similar information made the issues of standardized vocabularies and uniform systems imperative. In the greater world of art history, the success of the *AAT* is a limited one, since the English language is only one among those (German, Italian, French, and Spanish) which are used regularly in research and publications. In 1984, a committee was established under the aegis of the International Committee for the History of Art (CIHA). The Thesaurus Artis Universalis project established a number of goals for automated systems in art history. These were to establish model formats and authority structures for biographical data and historical geographical information and to develop a multilingual thesaurus. No simple tasks, these were ambitious efforts to pool the resources which were already available in several large databanks of art and architectural information. The development of terminology for the Art & Architecture Thesaurus Multi-Lingual Project will begin with the hierarchies established in the *AAT*.

The challenge for the future is epitomized by the thrusts in the development of the *AAT* which were based on real collections and used real language. The thesaurus integrates scholarly and popular terminology, realizing the virtues of standardized vocabulary while remaining flexible enough to respond to evolving usage and changes in the discipline. With the inception of the *AAT*, new types of projects were born which were not limited to a single collection of objects or materials or created for a single subject area.

A community of interest has developed among those who research art and those who curate and catalog collections of printed materials and archival documents. Great collections like the large North American museum libraries, the British Architectural Library, and the Avery Architectural and Fine Arts Library have been crucial in building a solid structure for electronic sources in the field of art literature. The support of strong professional associations has also been an important factor. Among the most significant groups which provide leadership in the development of computerized resources and technology are the College Art Association, the Art Libraries Society of North America, the Visual Resources Association, and the Museum Computer Network. All these organizations have provided forums

through their meetings, committees, special interest groups, and publications for the discussion of issues related to electronic resources for the dissemination of images and documents about art.

Two organizations deserve recognition for the fundamental impetus they provided in the development of automated resources for art. In some ways the J. Paul Getty Trust and the Research Libraries Group took a similar role in supporting art information projects to that which official institutions and projects, such as the Centre National de la Recherche Scientifique and the Canadian Heritage Information Network, played in the development of electronic resources for art research in France and Canada.

Almost a decade ago, following the settlement of J. Paul Getty's will, the Getty Trust took over the publication of a number of the important indexes to art literature. The trust assumed support for RILA in 1982 and, in 1983, it undertook financial responsibility for the Avery Index to Architectural Periodicals and for Art and Archaeology Technical Abstracts. As the number of art databases proliferated and access to personal computers increased, there came a recognition of the diverse needs which different groups and institutions had for machine-readable information.

The Getty Art History Information Program was established in 1983. The program took over the bibliographic projects for which the Getty Trust had assumed financial responsibilities—RILA and the Avery Index—and several projects to gather information on special areas of art history.

The Witt Computer Index was one of these original projects. As a collaboration with the Courtauld Institute in London, the index accesses the information stored in the photo archives of the Witt Library. The collection of reproductions of European paintings was founded at the beginning of the twentieth century by Sir Robert Witt. Now part of the Courtauld Institute, there are 1.5 million reproductions of works by over 75,000 artists. The size of the collection led to considerations of electronic storage and retrieval. The first section of records on the collection to be automated is the American school from the seventeenth to the twentieth centuries. Formerly, access was primarily by artists' names but, with automation, the files can be searched by subjects, collectors' names, exhibitions, and dates. With structures similar to catalogs raisonnés, the conventions of the automated Witt files are characteristic of art historical data. Each work of art may accumulate a series of records with information about different states, preliminary versions, restorations, and copies. Because of the complexity of the files, the Witt Index is available only in London; however, queries concerning the collection are encouraged. Answers to reference questions take the form of print-outs

if searches have yielded information, plus copies of the pictures for a small charge.

Another early art information project, the Provenance Index, was originally part of the Department of Paintings at the Getty Museum. Its primary interest is in archival sources such as lists of collections, archival documents, and inventories which identify art works, as well as records of auction sales and published inventories. The index collects and publishes information on the history of art collecting in terms of sales, inventories, and biographical information on collectors with a focus on European paintings. Access is mainly by artists and titles of works rather than images. In the past, the Provenance Index databases have been available only in Santa Monica, California, with research in the files available upon request. Very soon, approximately ten collaborating institutions in North America and Europe will receive CD-ROMs containing the Provenance Index databases.

A similar distribution project (the Census) is about to be implemented for the Census of Antique Art and Architecture Known to the Renaissance. The Census stores texts and images which document and describe the classical works still extant during the Renaissance. The files can be loaded onto a personal computer; images are stored on an accompanying video disk (in European format). Copies will be available at the Getty offices in Santa Monica, at the Warburg Institute in London, and at the Bibliotheca Hertziana in Rome. The latter institutions compiled the Census, and AHIP provided support for automating the database.

In recent years, the Getty Art History Information Program has begun to work on the other projects given a mandate by the CIHA. Two projects concerned with language and standards for art-historical names and places are the work of the Vocabulary Control Group (VCG). The VCG has developed two databases: The Union List of Artist Names (ULAN) and the Thesaurus of Art-Historical Place Names. ULAN is a database of artists' and architects' names produced from merging the files of nine Getty projects (among them RILA, the Avery Index, the Census, the Witt Index, and the Provenance Index). The contributors have received a preliminary edition of ULAN which is the precursor to the electronic version to be released in 1993. The final automated version will contain variant forms and reference sources for more than 110,000 names.

Produced from an experimental database of artists' names which was part of the Museum Prototype Project, Synoname is a software tool which is useful for matching and linking variant forms of artists' names without privileging particular forms. This is a new approach to authority control and reference research which allows for varying

forms of names. Synoname is currently available on diskette from the Art History Information Program.

The Thesaurus of Art-Historical Place Names is a similar list of places associated with art history and related research in the humanities and social sciences. As is the case for standard forms of artists' names, the use of standard place names for locations of monuments and for loci of artists' activity is essential to sharing data. Scheduled to become available in 1993, the thesaurus is being produced from merged files of Getty projects and the geographic information from the two leading producers of atlases, Rand McNally and Times Books.

Along with the specific bibliographic and information projects to which the Art History Information Program has given support, the program works closely with committees and associations of art historians, museums, and other interested groups on issues related to the automation of art information resources. With emphasis on the interdisciplinary nature of art history, AHIP is presently working with the American Council of Learned Societies on issues relating to linkages of art information with automation projects in the humanities. AHIP participates in the College Art Association Subcommittee on Electronic Information to promote awareness of the uses of new technology in the art community. A more specialized group was brought together at the 1990 College Art Association meeting. The Art Information Task Force has twelve members who discuss and recommend standards for information on art which will facilitate new ways to share information among the various types of art collections such as museums, slide libraries, and photo archives.

During the 1970s and 1980s, most of the large North American art libraries in academic institutions and museums were members of the Research Libraries Group and participants in its Art and Architecture Program Committee (AAPC). The strength of RLIN's holdings in art and the gathering of representatives from forty-five art collections allowed the group to address specific issues and accomplish a number of projects which provided greater online access to art information. The committee targeted projects of special use to art research, such as the *AAT*, and promoted greater implementation of the RLIN files for archives (AMC) and visual materials (VIM) for expanded access to art information. The AAPC advocated the addition of special files and databases to RLIN. A recent example was the loading of records for materials in the Archives of American Art. These are now part of the AMC file.

Apart from its specific programs addressing art information, RLIN has two important features which enhance scholarship. The general bibliographic files have special depth in the area of art

bibliography. This is because of the retrospective conversion projects which brought in records for the New York Public Library's art book collections and approximately 120,000 records for art books from other Art and Architecture Program Committee libraries. In 1991, the records for the impressive collections of exhibition catalogs at the University of California at Santa Barbara were added. The holdings of the two newest North American art and architecture collections at the Canadian Centre for Architecture and the Getty Center for the History of Art and the Humanities have been entered into RLIN as they are processed. Reflecting the collections of the major North American art libraries, RLIN is especially useful when searching for older materials. At the beginning of 1991, it was estimated that there were 800,000 records for art books in the system.

A second notable feature is that RLIN extends beyond books. Researchers can pursue name and subject searches through the auxiliary files and special databases to locate sale catalogs; manuscripts; ephemeral materials; visual materials like slides, posters, and prints; and machine-readable data files, as well as specialized holdings in architecture such as periodical articles and architectural drawings. An additional enhancement of the system are the machine-readable formats for non-Roman scripts: Japanese, Arabic, Chinese, Korean, Persian, Hebraic, Yiddish, and Cyrillic. Until recently, the study of art history has focused on the Western European tradition. The current debates about the canon in the educational process have injected doses of multiculturalism into traditional research. RLIN's ability to store and access information in non-Roman scripts allows for searches about the arts of cultures that are new subjects for art historical research.

Following some major organizational changes in 1991, RLG is expanding the RLIN data files and services. The Art and Architecture Program Committee has ceased to exist, although continued communication about art research is supported by an electronic bulletin board, RLGART-L. RLIN continues to be a major source for humanities research. Plans for the future are built on RLG's successful work with art library collections and on similar programs with archives and manuscript collections. Presently RLG is developing a prototype local system Archives and Museums Information System (AMIS). Projected for the end of 1992, the AMIS is a concrete step toward the establishment of a much discussed international database of primary cultural and scientific resources. AMIS is a microcomputer-based system which will allow museums and archives to store and manage all types of text files, as well as provide support for digitized images of architectural drawings, photographs, artifacts, films, and sound and video recordings.

Two of the newest files scheduled to be available later in 1992 extend RLIN's holdings further in the realm of nonbibliographic materials for research. Records from the Program for Art on Film will be added to the VIM file. A joint project of the Metropolitan Museum and the Getty Trust, the program has compiled a collection of over 16,000 records on international film and video productions on the visual arts. Also scheduled to be available this year, the Inventory of American Sculpture consists of more than 100,000 records from the database created at the National Museum of American Art. The inventory indexes public and privately owned sculpture which was created by American artists or produced in America from the colonial period to the present.

One final project which is important to mention is the source for current information about automated projects. The Clearinghouse on Art Documentation and Computerization is located in the Thomas J. Watson Library of the Metropolitan Museum with Patricia Barnett as its director. Founded in the early 1980s to assist the museum in systems development and to stay abreast of the rapid advances in art information systems, the clearinghouse consists of a database and document collection. The electronic resources consist of two files: an information directory on projects, systems, conferences, and organizations, and a bibliographic file of published and unpublished documents. The clearinghouse is used by a wide variety of art professionals and researchers who need information on computer technology projects and applications for art research. Staff are currently investigating ways to establish a shared database and increased access to the resources of the clearinghouse.

CONCLUSION

Recent decades were a period of intellectual voyage and discovery for computer applications in art history. Papers were written, articles were published, and cooperative projects were initiated. Many databases were mounted and used with success. Congresses and conferences were held on both sides of the Atlantic Ocean. Both DIALOG and RLIN now have a variety of files containing art information. These include most of the important current indexes to art literature.

The use of electronic resources in art as an autonomous field for study and research was marked by a book of essays entitled *Computers and the History of Art* (1989) and by the appearance of a journal in 1990 with the same name. Both emanated from the British professional association, CHArt. Yet the initial experiments with computers still have a tentative feeling not unlike the first years of television when we watched performers reading radio plays.

Art history allows for a great range of subjects which shed light on artists and their works. The process of gathering materials for research often leads through diverse subject fields. Art information is found in a variety of formats, and all these data must be integrated. This is the work of researchers, librarians, and information specialists. Proper indexing and cross references among systems would allow this work to be done by computer searches across disparate files.

There are many recent electronic reference tools which index the secondary literature. Most of these text databases have emulated their previous printed incarnations as single titles. New approaches to automated reference literature include groupings of related sources. The Architecture Database contains retrospective literature and the full text of a new publication which is not an electronic version of a printed edition. Experiments are just beginning with linkage of reference texts and images of the works described. The AVIADOR project and the Eastman House Catalog are examples of new kinds of collection catalogs which include graphics accessible via an accompanying video disk.

The second wave of computer applications are the thesauri and dictionaries of names and places. Developed to coordinate the various resources, projects, and source literature, these have the potential not only to provide links but also to become important independent reference sources for biographical and geographical research.

Electronic text sources in art history have taken three directions. One is to automate print sources and provide more efficient access. The second is to compile files of new types of information which were too cumbersome for indexes prior to the advent of computers. The third is to automate files of the basic data such as artists' and collectors' names and place names. These projects link variant forms and supply foreign language equivalencies for better cross-indexing among related reference tools.

Electronic publications provide very good access to art information published in the most recent decades. Several of the indexes overlap, and this makes for unnecessary redundancies in literature searches. For publications prior to 1950, coverage becomes uneven and, for some areas, it is nonexistent. Searching this earlier literature is difficult and indexing is scattered among a variety of disparate sources—online databases, printed library catalogs, subject bibliographies, and annual volumes of periodical indexes. This is surprising for a field where older literature retains its value for research.

Historians in the fields of art and architecture often base their studies on the original texts. The latter were published in late eighteenth-century and nineteenth-century books and periodicals;

many are part of larger general studies. It is these early publications which are the raw materials of research, and yet these seem to have the lowest priority for indexing. It is paradoxical that the materials of greatest interest to scholars have the lowest priority for online indexing. One project which addresses this problem is Mary Schmidt's index of nineteenth-century American art journals (Gould, 1988, p. 16).

In this new and continually expanding world of possible sources, librarians must play the roles of mapmakers, navigators, and stargazers to chart paths for researchers. Resources for art historical research include books and dissertations, exhibition catalogs, sales catalogs, art prints, photographs, audio and video materials, slides, cassettes, video disks, lecture notes, correspondence and other archival materials, and online communications—e.g., e-mail and electronic bulletin boards.

Researchers in art history are just beginning to be aware of the benefits of computer systems. They appreciate the efficiency of word processing. They like to use e-mail and FAX to communicate quickly with colleagues. Access to online catalogs assists scholars in planning trips to other libraries and collections. These simple modes are very popular. They probably will play the role of seducers, leading scholars on to complex applications. The discipline and its data are well suited to information systems and database management software. It is the methods of scholarly research which are slow to change.

Scholars in art history have a problem with delegating online research to "expert searchers." Most scholars like to work alone. They find out about new subjects by communicating with colleagues. They store their knowledge in their heads and their data in boxes of three by five cards. Serendipitous discoveries made in the process of research are important, and browsing has always had great value for art historians. The lack of specificity in titles of books and articles and the use of metaphoric language makes it desirable for researchers to work their way through bibliographic listings themselves. Yet the complexities of search commands and the need for efficient search techniques works against this. Databases on CD-ROMs and access to reference sources via networks on personal computers will go a long way to mitigate these temporary barriers to accessing information directly. Both sources obviate the high costs of online searching and allow for the contemplative browsing which is a popular activity among art historians.

Although art historical research is based on facts about artists and art, the discipline is an interpretative one. Much like archaeology and anthropology, art history constructs explanations of the past based on the information presently available; new discoveries make

for revisions. Art history concerns itself with philosophy and theory, questions of criticism, connoisseurship, and taste. What is the place of art and what does it mean? What is good work and how do we know it? It would be unfortunate for the study of art to follow the lead of history, which has become one of the social sciences, in a rash attempt for legitimacy. Art history is illuminated by new data and discoveries of sources, but it has never been a science like chemistry with formulas describing its substance.

Further evidence that art history is neither science nor social science is the acceptance that the data of art history and the auxiliary fields are highly variable. Artists' names change with time and foreign languages. In many cases we do not even know their names. Dates for people who lived long ago, or sometimes even recently, are problematic. Many works have no specific title; each author calls it something different. Dates of works are often the subjects of research. Most art works have a variety of dates associated with them and therefore possess individual art histories which must be accounted for. There are the problems of geography in standardizing place names, or even locating the places, after time has passed. In addition, the names of museums and other institutions associated with art, and linked to places, change frequently. In short, all of the institutions and structures implicit in the assembling of art information supply volatile data. These data are difficult for individual minds to compass but well-suited to the large files and search capabilities of automated systems.

With this in mind, we can recognize that art information systems do not threaten the very nature of the discipline, they only help to better account for it. In the past, art historians based their work on first-hand knowledge of the original sources. They drew material from diverse sources—i.e., art works in museums, monuments in situ, and archival documents in obscure collections. Recent developments have afforded more open access to documentary materials. New technologies, such as microforms of manuscripts, full texts available online, and imaging for works of art, allow general access to the building blocks of research. The intellectual ability to absorb much more information than in the past and to select and synthesize will be the new challenge for scholars, for soon they will be able to browse through texts and images at their own workstations.

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