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# The Arts and Architecture Thesaurus (AAT)

## A critical appraisal

Long version. A shorter version is available

### 1 Introduction: Thesauri in information retrieval

What is a thesaurus and what is its purpose? Describing the functions of a thesaurus in a nutshell will provide the background for a critical examination of the AAT. A thesaurus is a structured collection of concepts and terms for the purpose of improving the retrieval of information. A thesaurus should help the searcher to find good search terms, whether they be descriptors from a controlled vocabulary or the manifold terms needed for a comprehensive free-text search — all the various terms that are used in texts to express the search concept. Most thesauri establish a controlled vocabulary, a standardized terminology, in which each concept is represented by one term, a descriptor, that is used in indexing and can thus be used with confidence in searching; in such a system the thesaurus must support the indexer in identifying all descriptors that should be assigned to a document in light of the questions that are likely to be asked. A good thesaurus provides, through its hierarchy augmented by associative relationships between concepts, a semantic road map for searchers and indexers and anybody else interested in an orderly grasp of a subject field.

A good thesaurus can be used for automatic search query expansion in two ways:

- (1) synonym expansion, adding all the synonyms for a search term; needed for free-text searching. For example,

**color proofs**            add    color separations

**barrel vaults**            add    cradle vaults, tunnel vaults, wagon vaults, wagonhead vaults

**bluish gray**            add    aqua gray, baby blue, blue black, blue gray, centroid color 191, light Payne's gray, pewter, powder blue, slate

- (2) hierarchic expansion, adding all the narrower terms for a search term (also called inclusive searching). This is needed whether one searches with a controlled vocabulary or free-text, for example,

**humanities**            add    arts, linguistics, literature, philosophy, history, etc.

**gold**                    add    electrum, chryselephantine sculpture

**barrel vaults**            add    annular vaults, half barrel vaults, rampant barrel vaults, spiral vaults

**saints**                    add    **hagiography, hagiographies**

Synonym expansion requires that synonym relationships be recorded completely and explicitly in the thesaurus; hierarchic expansion requires that hierarchic relationships be recorded completely and explicitly.

A good thesaurus provides guidance to the indexers. In the approach of **request-oriented indexing** (or **user-oriented indexing**) the concepts to be included in the thesaurus are collected from actual and expected search requests. They are then organized into an easily grasped structure that serves as a framework or checklist for the indexer in analyzing objects or documents. The users have told the thesaurus builder what they are interested in and the thesaurus builder has organized these interests into a logical framework that communicates user interests to the indexer. The indexer can now consider these interests in analyzing documents, making sure that an object or document will be assigned all descriptors under which a user may want to find them. Request-oriented indexing requires a well-structured thesaurus; it depends on the semantic road map provided by the thesaurus. Request-oriented indexing starts with a hierarchical display, using the alphabetical display only for augmentation.

The AAT indexing instructions (vol. 6, ch. 2) espouse an approach to indexing in which the indexer first does a conceptual analysis of the item to be indexed. This analysis, while it should consider the needs of the user community, is done independently from the thesaurus, not informed by the thesaurus structure. It results in a list of concepts expressed in the indexer's own terms. The thesaurus comes into play only in the second step, translating the concepts into AAT descriptors. This step starts with the alphabetical display, looking up the indexer's own terms, finding the corresponding AAT descriptors, and then locating the descriptors in the hierarchy to verify that they provide the best fit or to find a better descriptor in the hierarchical neighborhood. While this method does not depend as heavily on good thesaurus structure as request-oriented indexing, it still profits from good structure.

Good thesaurus structure is even more important for searching. It helps the user to form a well-structured image of the search topic and how it fits in the overall scheme of things. A good and complete hierarchy is essential for hierarchic expansion of search terms — a searching device whose importance can hardly be overstated. It is here that the knowledge incorporated in a good thesaurus is brought to bear on improving search results; we could speak of knowledge-based search support.

Thus thesaurus structure will be the key concern in this review.

## 2 Scope

This thesaurus is a monumental work. In five volumes it gives 24,500 descriptors, 2,750 guide terms, and about 20,000 synonyms (descriptor **color proofs**, synonym *color separations*), or about 47,000 terms. If one counts the approximately 16,000 Alternate Terms (mostly singular/plural variations, such as ALT *color proof*), the approximately 27,000 permutations (*proofs, color*) plus 2,000 British variations (UK *colour proofs*), there are over 90,000 terms. (These numbers are based on "63,003 alternate and lead-in terms" mentioned in the introduction

and analysis of a sample of 280 such terms, indicating that they divide into 32% synonyms that are truly terms different from the descriptor, 25% alternate terms, and 43% permutations.) The editorial staff counts almost 20 members, close to 250 people participated in review teams. The list of sources used to verify terms takes 140 pages.

This thesaurus will be an important tool for indexing any kind of item (text, image, object) in "archives and special collections, libraries, museums, and visual resources collections" (vol. 6, p. 81). It can indeed "be used to describe objects collected by a wide variety of museums, the visual surrogates of these objects (slides, photographs, etc.), the documents and records held in archives and special collections, and literature about art and architecture." (vol. 6, p. IVX)

The scope of the AAT is defined in the introduction as "fine arts, architecture, decorative art, and material culture of the Western world from antiquity to the present" (vol. 1, p. 30); the scope includes conservation. "Material culture" (a term that could be understood to include all of technology) is pragmatically limited to descriptors useful for the description of objects likely to be encountered in museum collections ("broad-based material culture collections", vol. 6, p.83). Concepts from literature, theater, film, and music are covered only as they are needed within the focus on fine arts. Thus *Fine arts and architecture thesaurus* would be a more accurate title. On the other hand, the thesaurus covers the entire world, not just the Western world, as can be seen from a quick look at the facet FL *Styles and periods*. (However, in some areas it is limited to the Western world; for example, under KM101 <*religious holidays*> only Christian and Jewish holidays are listed.) The thesaurus has many descriptors to specify what is depicted in a work of art, but descriptors for the human form and anatomy (such as **head**, **hand**) are notably missing, and corresponding descriptors for objects from the plant and animal world, while scattered here and there, are not included systematically. Potential users must note two important exclusions. There is no section devoted to methods in art history, even though individual terms may be found here and there. Furthermore, as explained in the editorial policy, the thesaurus makes no specific effort to cover iconographic themes. Information systems serving art history (bibliographic systems or systems covering art objects) will need to supplement in these areas from other sources. "The AAT was not intended to cover all elements that may be required for indexing. Other controlled vocabularies exist or are under development, as well as name lists to accommodate artist names and place names. *ICONCLASS* contains iconographic descriptions having thematic and symbolic significance beyond the level of Object Names, Events, and Associated Concepts. The *LC Thesaurus for Graphic Materials (LCTGM)* contains a broader range of topical terms at an in-depth level of pictorial detail. . . ." (vol. 6, p. 37). (Vol. 6, p.92 mentions additional authority lists, including the *Thesaurus of Geographic Names* under development by the Getty Art History Project.) The user must also turn to other sources for a classification of languages which may be needed in the description of records. It might be helpful for the AAT to give an official list of such "auxiliary thesauri" to be used to assure consistency among AAT users.

### 3 Sources and descriptor selection

Six existing broad-based vocabularies served as the principal sources of concepts and terms. To quote from the introduction:

**4.3.1 Establishing AAT Descriptors.** Terms chosen as descriptors reflect, as far as possible, the vocabulary used by scholars and other researchers. An effort has been made to include vocabulary used by archivists, museum curators and registrars, visual resources curators, librarians, and other information professionals who organize and describe information in the areas covered by the thesaurus. Terms were initially gathered from the following controlled vocabularies already in use in the field:

*Avery Index to Architectural Periodicals*  
*BHA (Bibliography of the History of Art)*  
*Library of Congress Subject Headings (LCSH)*  
*Revised Nomenclature for Museum Cataloging*  
*RIBA Architectural Periodicals Index*  
*RILA (International Repertory of the Literature of Art)* (Introduction, vol. 1, p. 33)

Smaller, specialized sources were also used. The introduction to the Color hierarchy mentions Kelly and Judd's *Color: Universal language and dictionary of color names* and "other well-known color-order systems". Digging deep into volume 6, one finds that *Form Terms for Archives and Manuscript Control*, created by Elaine Engst and H. Thomas Hickerson of Cornell University to standardize form terms used in archives "provided the basis for what is now the Information Forms hierarchy" (vol. 6, p. 96), and that the *spheres of activities and processes* list created by a group of state archivists "was incorporated in the AAT Functions hierarchy" (vol. 6, p. 97). "The terminology used in the construction of the AAT was drawn from the five major vocabulary sources mentioned above, as well as from authoritative literature and the advice of experts in the fields of art, architecture, decorative arts, and material culture." (vol. 6, p. 75) It is not clear how many terms were added from these open-ended sources. "Another source of terminology, the users of AAT, is extremely important as well. AAT users are encouraged to submit candidate terms to be considered for inclusion in the thesaurus and to communicate to the editorial staff their comments on existing terminology." (vol. 6, p. 75) While the importance of users as a source of terms is stated here, it appears that there was no systematic effort to collect search requests from actual end users and use these requests as a source.

The compilers have done a comprehensive job of collecting terms, (even though actual requests were apparently not used as sources) and selecting descriptors. Even in a work of this magnitude it is unavoidable that concepts are overlooked. For example, while old photograph sizes (mostly used for daguerreotypes) are given under DC111 <size: *photograph formats*>, modern photograph sizes are not, possibly because there are no terms, just measurements.

**Classifications** (as a document genre) is missing, even though VW878 **thesauri** is there. Only a handful of scripts and alphabets are given in PJ3434 **scripts (writings)**.

## 4 Overall structure

The Arts and Architecture thesaurus (AAT) consists of two major parts: The hierarchical display and the alphabetical display. Figures 1 - 3 show the top-level outline of the hierarchy, a sample page of the hierarchical display, and a sample column of the alphabetical display. The alphabetical display links to the hierarchical display through term numbers, such as MT327, which lead to the proper place in the hierarchy. The hierarchy lists primarily descriptors, such as \*\*\*select examples from sample pages\*\*\* or KD209 **behavioral sciences** (in bold type), but also includes a number of *guide terms*, such as \*\*\* or KD42 <linguistics and related disciplines> (non-bold italics enclosed in <>). Guide terms are used as headings of minor facets or simply as terms needed as headings in the hierarchy but not verifiable in a source. (See the section on the form of terms for a fuller discussion.)

Many thesauri either do not include a hierarchical display, or tack on a hierarchical display at the end, almost like an afterthought, slapped together by a computer program from the BT/NT relationships given in the alphabetical main part. The editors of the AAT are to be congratulated for developing a structured hierarchical display in its own right and placing it before the alphabetical display. Indeed, the hierarchical display is the heart of a good thesaurus - the semantic road map.

Accordingly, this review examines first the conceptual structure of the AAT and the logic of its hierarchy, and then deals with matters of format and presentation.

## 5 Conceptual structure of the AAT

This section discusses first the fundamental principle of building compound concepts from elemental concepts — just like building molecules from atoms — as it is applied in the AAT. It then examines the structure of the AAT hierarchy.

### 5.1 Facets and concept combination

The introductory material repeatedly emphasizes that AAT descriptors are single concepts: "Each descriptor included in the AAT represents a single concept" (Introduction, vol.1, p. 33). And again, "A descriptor in the AAT is a single unit from any hierarchy. AAT descriptors may be single- or multi-word terms, but in all cases they signify a single concept." (vol. 6, p. 42)

The descriptors are arrayed in *facets*. A facet arrangement groups concepts by the role they play in relationships to other concepts — by their syntactic role, so to speak. Examples are given in Figure %b.

Several elemental (single-concept) descriptors can be combined to build a **modified descriptor**, as shown in the following example:

Rococo carved gilded wood chairs

Facet	Descriptor no. and text		
F Styles and Periods	FL3265	Rococo	modifier
K Activities	KT911	carved	modifier
K Activities	KT139	gilded	modifier
M Materials	MT2670	wood	modifier
T Objects	TC449	chairs	focus

Elements are combined in the sequence of the AAT facets; the AAT facet order has been chosen so that this rule produces in many cases the most natural order of modifiers. Elements from the same facet are arranged alphabetically. (In the example, *Rococo gilded carved wood chairs* would make more sense, joining the activity applied first more closely to the object.)

Another example is

quarter plate deteriorated negatives

This principle of combining elemental descriptors to form compound concepts gives great flexibility; it makes it possible to express a myriad of very specific object descriptions and other combinations by means of a limited basic vocabulary.

Building modified descriptors is the first level of combination. On a second level, descriptors (modified or not) can be further combined into **strings**, for example

Rococo gilded carved wood chairs — collecting  
paper — restoration — archivists (the restoration of paper by archivists)

Elements within a string are arranged in reverse facet order; again in many cases this results in the most natural order. In addition to AAT descriptors, a string can contain place names and dates, for example

The restoration of wood chairs in New York in 1980  
wood chairs — restoration — New York — 1980

Unfortunately, place names and dates are not allowed as modifiers in a modified descriptor, leading to inconsistency. In the topic

The restoration of nineteenth-century Massachusetts wood chairs in New York in 1980  
**1800-1899** and **Massachusetts** modify the focus concept **chair** in the same way as **wood**; thus we should have the modified descriptor

1800-1899 Massachusetts wood chairs

The whole topic moves on to **restoration** of such chairs, this activity taking place in **New York** in **1980**. The whole topic should thus logically be represented as

1800-1899 Massachusetts wood chairs — restoration — New York — 1980

Since place names and dates are not allowed as modifiers, the instructions in the AAT manual gives the following, less natural string

wood chairs — Massachusetts — 1800-1899 — restoration — New York — 1980

Detailed rules for forming modified descriptors and strings are given in vol.6, ch. 3.

The scheme outlined is simple and logical and quite useful in many cases, but alas, reality is not always so neat. The AAT structure does not address the complexities that arise in the application of this scheme and creates some difficulties of its own by introducing precombined descriptors. The remainder of this section unfolds these complexities.

For starters, some single concepts are hard to place. For example, Facet D **Physical attributes** includes the hierarchy DE **Conditions and effects**, including such descriptors as DE34 **rust** or DE39 **oxidative-reductive deterioration**, yet some concepts one might expect here are found in the Facet K **Activities**, Hierarchy KT **Processes and techniques**, under KT224 *<condition-changing processes>*, for example, KT231 **deterioration**. For another example, there are many descriptors that can be viewed as material or as objects or components of objects, for example MT1540 **yarn** or MT71 **brick** (which is more an object or component) or MT1661 **tile** (which really describes a form, not a material, as evident from the scope note and from MT156 **ceramic tile**). Thus many of the facets are incomplete taken by themselves; while the introductions to the individual hierarchies make some of the necessary connections, the reader within a hierarchy is not aided by cross-references.

Second, there are many "minor" facets **within** the individual hierarchies. For example,

PC204 **lighting**  
 PC205       *<lighting by function>*  
 PC207               **decorative lighting**  
 PC210       *<lighting by location or context>*  
 PC211               **exterior lighting**

exterior decorative lighting

must be expressed as a modified descriptor

decorative lighting exterior lighting

The rules do not give guidance on how to do this. Figure %a gives a much more complex example of this situation. How to index a

composite black-and-white aerial photograph published in a newspaper

or a

later chromogenic color print?

Minor facets are not always explicit. VC311 **copy prints** and VC312 **later prints** are not grouped under a heading <*photographic print by time when made*>. Indexing *computer-produced fantastic commercial art*, requires a combination of three descriptors under BM173 <*art genres*>: **fantastic art**, **computer art**, and **commercial art**, each belonging to a different facet, even though this is not made explicit in the AAT. See Figure %c.

Third, the announcements to the contrary notwithstanding, the AAT enumerates a great many precombined descriptors. This is not necessarily a bad thing, but it needs to be acknowledged and considered in the instructions for using the thesaurus. Furthermore, it makes the real concept relationships more complex and the failure of the AAT to provide adequate cross-referencing even more noticeable. This point is so important that it warrants further elaboration and illustration.

Both **decorative lighting** and **exterior lighting** are precombined. Given the proper elemental AAT descriptors, they could be built as modified descriptors. However, there is no general facet *location or context*, and thus no descriptor **outdoors** (or **exterior** in the sense of "outside a building"; DC325 **exterior** has a more general meaning), nor is there a descriptor **decorative** (There is KT271 **decoration** which can be used in the alternate form **decorated**, but that is not the same). In these examples, one of the components (**lighting**) is an AAT descriptor, but the other component (**outdoors** or **decorative**, resp.) is not, indicating a lapse in the conceptual analysis. Similarly, RK661 **libraries (buildings)** is a precombined descriptor, combining a type of organization with RK4 **buildings**; the same is true for RK665 **public libraries**, which really means **public library buildings**. While there is a list of library types (such as public libraries, presidential libraries) under RK661 **libraries (buildings)**, there is no such list under HN131 **library service agencies** in the **Organizations** hierarchy, where it properly belongs. Similarly, RK130 **financial institutions**, many of its narrower terms, and like terms in RK should be in a hierarchy of organizations, to be combined with RK102 **commercial buildings**. (Is there really a special type of building for **Federal reserve banks**?)

VC295 **gelatin silver negatives** has the components KT526 **gelatin silver process** and VC285 **negatives**, both AAT descriptors. This is just one of many examples of precombined descriptors in the **photographs** hierarchy, excerpts of which are shown in Figure %a. Another example is VC358 **black-and-white slides**. The elemental concept **black-and-white** is not represented by an AAT descriptor even though it is widely applicable through the graphical arts and any other form of display.



BM191 **funerary art**, KM29 **funerals**, PE63 **funerary objects**, RK424 <*funerary structures*>, TC174 **funerary palls**, TC231 **mourning quilts**, TQ139 <*funerary containers*>, VC515 **funerary sculpture**, RK424 <*funerary structures*> and others all share the component **funerary**, which again is not represented by an AAT descriptor. There is a cross-reference from PE63 **funerary objects** to KM29 **funerals**, TQ139 <*funerary containers*>, and VC515 **funerary sculpture**, but not to the other descriptors listed. There are no cross-references under BM191 **funerary art**, and there are no cross-references to religion-related descriptors.

RG83 <*housing by occupant*>, includes **faculty housing**, **housing for the handicapped**, **military housing** etc. (but RK757 **orphanages** under RK749 **welfare buildings**). All of these could be expressed by combination (for example, **military housing** = HG1212 **military personnel** + RG55 **housing**). In advance of the detailed discussion of cross-references below, we note that there are no cross-references from the agent descriptor to here, e.g., no cross-reference from HG1212 **military personnel** to RG87 **military housing**.

TH1137 **marvers** is a precombined descriptor with the components KT1040 **marvering** and TH1 **equipment**. In fact, **marvering equipment** would be a perfectly legal modified descriptor, but since **marvers** is a descriptor, it must be used. The same is true for VC321 **chromogenic color print**, which must be used in preference to the combination KT556 **chromogenic processes** + VC317 **color prints (photographs)**. Contrast this with **cutting (glassworking) equipment**; here the modified descriptor (KT1032 **cutting (glassworking)** + TH1 **equipment**) must be used, since there is no descriptor for this compound concept. To confound the indexer even further, **glassworking equipment** must be formed as a modified descriptor (KT1028 **glassworking** and TH1 **equipment**), since TH1134 <*glassworking equipment*> is not a descriptor, but a guide term. None of the modified descriptors would be found in a hierarchically expanded search for TH1134 <*glassworking equipment*>.

The last example illustrates the problem of how to relate processes and techniques to the equipment that actually applies these processes and techniques, a problem that has perennially plagued classifiers. One solution is to represent all equipment through combinations (modified descriptors in the AAT). However, that solution is not satisfactory, since specific equipment can often not be expressed by such combination. The other solution is to include specific descriptors for equipment where needed and rely on combination otherwise. This approach requires complete articulation between the **processes and techniques** hierarchy and the **equipment** hierarchy, a topic to which we shall return below. In any event, having processes and equipment for the same subject (e.g., painting) in one place would probably be more helpful than separating them.

A final complication is illustrated by the following example

VC538 **bronzes**

SN Use collectively for the class of sculpture executed in bronze, especially figures or figurine groups. When possible, use the material term plus a more specific object name, such as **bronze** + **figurines**.

There are hundreds of possible combinations such as **lead bronze high reliefs** or **bronze nudes**. A search for the descriptor **bronzes**, even if hierarchically expanded, will not find any of them. The problem is that the AAT enumerates a broad precombined descriptor but relies on building modified descriptors for more specific combinations. It would be better not to have a descriptor **bronzes** and have the indexer build MT396 **bronze** + VC502 **sculpture** and have the searcher use that combination as well, each component hierarchically expanded.

## 5.2 The structure of the hierarchy

Structuring a set of descriptors as vast as that included in the AAT is a gargantuan undertaking that needs to proceed through many steps of refinement. A second (and third, and fourth) look will always detect mistakes, relationships not considered, possibilities for improvement. This is even more true for a look by a new pair of eyes. Thus the critical examination that follows should not detract from the accomplishment manifest in the AAT hierarchy as it brings together many useful and specific groupings of concepts.

However, as the examples below illustrate, the daunting task of organizing these terms into a coherent and helpful structure has only just begun; the AAT has still a way to go to fulfil its potential as a tool that gives a structured and easily comprehensible view of art field and gives full support to indexing and, above all, searching.

### 5.2.1 Overall structure of the hierarchy

The overall layout of the hierarchy as shown in Figure 1 is based on two principles:

- (1) To group concepts by facet first and to group by subject within facets as appropriate.
- (2) To arrange concepts from the general to the specific, or from "abstract concepts to concrete artifacts" (vol. 6, p. 38).

We will examine these two principles in turn.

By grouping concepts according to syntactic role, a facet arrangement disperses concepts that belong to the same subject area, thus neglecting groupings that might be more natural and useful. The hierarchies **PC Object Groupings and Systems** and **PJ Components** provide a particularly stark example:

PC233	fire extinguishing systems
PJ940	<fire extinguishing system components>
TH950	firefighting equipment (includes TH952 fire extinguishers)

The first edition of the AAT had at least the first two of these together.

Another example is the separation of descriptors related to the organization of information:

HN124	<b>information services</b> (under organizations)
KG106	< <i>information handling functions</i> > (includes authority control)
PC83	< <i>information artifact groupings</i> > (includes files, authority files)
VW1	< <i>information forms</i> >
VW2	< <i>document genres</i> >
VW3	< <i>document genres by form</i> >
VW12	<b>catalogs</b>
VW35	<b>databases</b>
VW169	<b>lists</b>
VW170	< <i>lists by form or function</i> >
VW171	<b>attendance lists</b>
VW172	<b>bibliographies</b>
VW173	<b>checklists</b>
VW331	< <i>document genres by function</i> >
VW448	<b>instructional materials</b>
VW454	<b>finding aids</b>
VW813	< <i>reference sources</i> > various type, incl.
VW852	<b>glossaries</b>
VW854	<b>indexes</b>
VW876	<b>reference books</b> (note: any of the reference source types could be books)
VW878	<b>thesauri</b> (but not <b>classifications</b> )

More extensive examples are given in Figure %da-c.

The separation of descriptors that should be together is all the more unhelpful as cross-references are very sparse, as we shall discuss below. While the alphabetical display brings some of the dispersed descriptors together, it does not work for DC111 <*size: photograph formats*> or DC213 <*operational attributes: firearms*>, which are not shown under **photograph** or **firearms**, respectively, since guide terms are not permuted. In any event, while proximity in the alphabetical index may help the user in assembling a list of search terms, it does not support automatic hierarchical expansion. Intelligent search support requires more thorough and explicit structuring.

On the other hand, grouping by facets works well in some cases, such as **Color**, which is clearly a useful grouping that stands on its own, independent from any subject. The same may be true for **Styles and Periods**, even though concepts there might depend on the branch of art. **Materials by composition** is another candidate for an independent facet, while **Materials by function** might be divided into pieces to be grouped with subjects.

The best strategy to achieve a helpful arrangement is the following: Pull out those facets that clearly stand out on their own and that can be pulled out without dispersing descriptors belonging to the same subject area. Arrange the other descriptors by subject. Use the same principle within a large subject area: Pull out subject-wide facets, arrange the remaining descriptors by subject subdivisions, etc. Some of the within-subject facets will come from a general facet scheme, others will be specific to the subject or subject subdivision.

A linear hierarchical arrangement can show but a fraction of the hierarchical relationships that exist between concepts and that are needed to assist indexers and searchers. This is all the more true in a thesaurus that contains many precombined descriptors. Thus there are many, many relationships not shown by the arrangement in the AAT hierarchical display. These relationships — the relationships not implied by the arrangement — must be shown by an extensive network of cross-references.

The second principle used for arranging descriptors in the AAT is to proceed from the general to the specific, or from "abstract concepts to concrete artifacts" (vol. 6, Ch. 2, Section 4); as a result, the sequence starts with **Associated Concepts**, which are at the periphery of the scope (and not really a facet anyhow), and ends with **Objects**, which are at the center of the scope. The overall sequence should convey an image of the structure of the field and also guide the indexers as they focus their attention on different aspects of a document or other object; the degree of generality is a secondary criterion.

The introductory material states that the "progression of the AAT facets corresponds to the indexing process" (vol. 6, Ch.2, Section 4). While it is true that the sequence of facets corresponds to the sequence of AAT descriptors in building a modified descriptor, it hardly corresponds to the sequence in which the indexer analyzes an object. Surely the indexer determines first the basic type of the object, choosing a descriptor from the **Objects** facet, and then proceeds to identifying the modifying characteristics. Vol. 6, p. 81-85 summarizes the AAT areas of interest to archives, museums, and visual resources collections, respectively; it invariably starts out with objects or elements of the **Objects** facet.

The arrangement used in the AAT does simplify the building of compound (modified) descriptors, since the sequence of facets corresponds to a natural sequence of components in such a combination. However, it does so at great cost by not serving other, perhaps more important, objectives of arrangement. Why not arrange the descriptors in the most cogent semantic map of the field and communicate the sequence of components in a modified descriptor through other means, for example, by a facet indicator letter at the end of the term numbers?

### 5.2.2 Relationships augmenting the monohierarchical display

Perhaps the most serious shortcoming of the AAT hierarchy is its monohierarchical nature. A monohierarchical system forces the rich and multi-faceted relationships among concepts into a straightjacket in which each concept is allowed only one broader concept. In contrast, a polyhierarchical system shows all useful hierarchical relationships, some through the descriptor

arrangement and others through Broader Term/Narrower Term cross-references. In the AAT, hierarchical cross-references are not included, and Related Term cross-references are very sparse and appear only in the alphabetical display.

We have already discussed some of the problems this absence of cross-references creates. Figure %d shows descriptors from the same subject area dispersed in many places; they should at least be linked through cross-references, but most often they are not. The following examples illustrate the point further.

The introduction to the **Recreational Artifacts** hierarchy (TV) recognizes that there are many descriptors that should be included but are listed at another place where they also belong, and does make some general cross-references.

**Relation to Other Hierarchies** Descriptors for sets of recreational artifacts (e.g., **chess sets**) are found in the Object Groupings and Systems hierarchy. Descriptors for sports and athletic equipment worn on the body (e.g., **helmets**) are found in the Costume hierarchy. Descriptors for objects used in sports but originally intended or based closely on offensive or defensive weapons (e.g., **épées, javelins**) are found in the Weapons and Ammunition hierarchy. [Yet TV63 **sporting firearms** are under Recreational Artifacts!]. Descriptors for objects that can be used in sports or play but are primarily or originally intended to carry people or goods over a distance (e.g., **sleds, canoes**) are found in the Transportation Vehicles hierarchy. Types of figural representations not intended as toys are found in the Visual Works hierarchy (e.g., **kachina dolls**).

But specific cross-references within the hierarchy itself are missing.

The introduction to the **information forms** hierarchy (VW, vol.2, p. 507) clearly recognizes the problem of polyhierarchy, but again nothing is done about it in the hierarchy:

"Wherever possible, documents serving uniquely as records in a particular type of context or institution are placed in this section in the categories under **records**, rather than by their general form or function. Thus, for example, VW698 **marriage certificates** appears as a narrower term under VW696 **marriage records** [which is in turn under VW688 **vital statistics records** in VW514 <*records by form or function*> in VW513 **records** in VW331 <*document genres by function*>] rather than under VW334 **certificates** [in VW331 <*document genres by function*>]." (Term numbers added for easier orientation.)

Clearly there should be cross-references like

VW334 **certificates**  
NT VW698 **marriage certificates**

The argument that the user can always find **marriage certificates** under **certificates, marriage** in the alphabetical index does not hold. The semantic structure of a concept is not always expressed so explicitly through the term (see some of the examples below), and the hierarchy needs to stand on its own, if it is to guide the indexer and support hierarchical expansion in searching.

## Other examples of missing cross-references

- RK1061      **mosques**  
BT BM503 Islam [or at least RT]
- BM16        **religious symbolism**  
BT BM518 religious concepts
- BM212      **hagiography**  
BT HG1023 saints  
RT HC358 hagiographers  
RT VW265 hagiographies

Note 1: Purists would not use BT HG1023 saints because **hagiography** is not a kind of **saint**. Pragmatically, the question is simply: Does a user searching under **saints** generally want to find documents on **hagiography**. If so, BT should be used. Alternatively one might use RT, but there should be a cross-reference.

Note 2: BM212 **hagiography** refers to hagiography as a general genre, VW265 **hagiographies** refers to a document form.

- KD2         **humanities**  
NT <*history and related disciplines*>  
(which is grouped with KD202 social sciences)
- MT416      **gold**  
NT VC539 chryselephantine sculpture [or RT]
- MT1322     **ivory**  
NT VC539 chryselephantine sculpture [or RT]
- MT1540     **yarn** (under MT1535 <*textile by form*>)  
RT MT1660 thread
- MT2364     **photographic material**  
NT MT1481 photographic paper (which is under MT1463 paper by function)

A number of relationships **are** included (but, as all relationships, listed only in the alphabetical display). All relationships are RT (Related Term), even if BT (Broader Term) or NT (Narrower Term) would be more appropriate, since there is no provision for BT/NT relationships in the AAT.

- BM193      **nonrepresentational art**  
RT FL3380 Nonobjective [art]  
[Note: nonrepresentational art is the general descriptor, nonobjective is used for 20th-century art]
- TN333      **exposure meters**  
RT TH768 <*camera accessories*>

### 5.2.3 Microstructure of the hierarchy

A hierarchical arrangement should convey to the reader a sense of order, a sense of grasping the structure of a whole field or of a small segment, allowing her to build an orderly image in her own mind. Clear structure supports good descriptor selection by bringing closely related or contrasting descriptors close together. Clear structure also allows the thesaurus editor to spot missing concepts (just as the periodic table of elements, once conceived, led to the identification of missing elements which were later discovered). In contrast, the AAT arranges descriptors on the same hierarchical level in alphabetical order, depriving the reader of that sense of order. Consider the following two arrangements; which is more satisfying to the mind?

DC111	<size: <i>photograph formats</i> >	DC111	<size: <i>photograph formats</i> >
DC112	<b>double whole plate</b>	DC112	<b>sixteenth plate</b>
DC113	<b>half plate</b>	DC113	<b>ninth plate</b>
DC114	<b>ninth plate</b>	DC114	<b>sixth plate</b>
DC115	<b>mammoth plate</b>	DC115	<b>quarter plate</b>
DC116	<b>quarter plate</b>	DC116	<b>half plate</b>
DC117	<b>sixteenth plate</b>	DC117	<b>whole plate</b>
DC118	<b>sixth plate</b>	DC118	<b>double whole plate</b>
DC119	<b>whole plate</b>	DC119	<b>mammoth plate</b>

For another example see VK56 <*Later Western World Coins*>; the coins are arranged alphabetically by name, not by country or money system.

Fig. %c shows a more complex example. The effort to create order brings to light several minor facets that enhance the understanding of the subject and indicate possible combinations hard to detect from the alphabetical sequence.

### 5.2.4 Articulation between hierarchies using the same principle of subdivision

The user of a hierarchy has a right to expect consistency for ease of orientation. Two hierarchies that are based on the same principle of subdivision (such as subdivision by color or subdivision by discipline) should be arranged in the same way, and corresponding concepts should be cross-referenced. For example, the color sequence under MT2066 <*pigment by color*> should parallel the **Color** hierarchy (DL). However, in the color hierarchy the color sequence follows the spectrum, under MT2066 it is alphabetical. There are no cross-references linking a color and the pigment(s) producing that color.

Likewise, the sequence under HG70 **people by occupation** should match the sequence under KD **Disciplines**; while there are many similarities, there are also many differences. For example, in KD the sequence is KD99 **science**, KD202 **social sciences**; in HG70 it is the other way around. Compare the two hierarchy excerpts under **social sciences**:

		HG439	<people in the social sciences and related occupations>
KD202	social sciences	HG440	social scientists
		HG441	anthropologists
KD203	archaeology	HG446	archaeologists
KD209	behavioral sciences	HG455	<people in history and >
KD210	anthropology		
KD221	<psychology and rel. d.>	HG470	psychologists
KD231	sociology	HG471	sociologists
KD237	communications	HG472	<people in social science-related occupations>
KD273	<history and related d.>		
		HG473	<p. in communications>
KD293	information science	HG497	information scientists

In this case, the necessary cross-references (e.g., KD2 **humanities** RT HG203 <people in the humanities>) are there. (Of four cross-references checked only one is missing; there is no cross-reference from KD237 **communications** to HG473 <people in communications>).

These are just two examples of many, many cases where hierarchies should be parallel but are not; in the majority of cases, cross-references are missing as well.

## 6 Format of the AAT

This section discusses the form in which the descriptors and their relationships are expressed, dealing first with the form of the individual terms and then with the format of the two main parts, the hierarchical display and the alphabetical display.

### 6.1 Choice and form of terms

Strict standards were applied for descriptor selection:

Each *AAT* descriptor, no matter what its source, must be validated against the literature of the field. Each descriptor is checked in several sources in order to establish its form and meaning and to ensure that all word forms (i.e., synonyms and alternate spellings) are included. The actual form of a descriptor must have literary warrant. It is not enough that the concept a descriptor denotes is discussed within the body of a text; the term itself must be used in the text. (Introduction, vol. 1, p. 34)

However, the real measure for selecting a concept as descriptor should be its usefulness for retrieval. A concept may never be explicitly mentioned in any text yet offer a useful perspective for retrieval; indeed, one of the most important tasks in thesaurus-building is to identify and define such concepts in the course of the conceptual analysis. Once a concept has been selected



as descriptor, it is useful to find the most appropriate term and verify it in the literature. But if no suitable term is found, the lexicographer must invent one. New concepts often emerge as the hierarchy is developed. If a proper broad concept does not happen to have a term that is verifiable in the literature, AAT introduces a "guide term", printed in the hierarchical display in non-bold italics enclosed in <>, for example, KD42 <*linguistics and related disciplines*>. Conceptually, this has the same status as KD209 **behavioral sciences**; there just does not happen to be a term in vogue.

The distinction between guide terms and descriptors is not helpful. As an example, consider this text from the introduction for Styles and Periods:

The second section, <*styles and periods by region*> . . . is divided into the following: **African**, <*The Americas*>, **Asian**, <*Early Western World*>, **European**, <*The Islamic World*>, **Oceanic**, and <*international post-1945 styles and movements*>.

This is terrible to read, and it is no better in the hierarchies, particularly since the italics make the headings stand out less than the bold-face descriptors under them. All the guide terms in this quote would be perfectly useful descriptors - but they are not available for indexing; in the right searching system, they might be available for inclusive searching. The only result of this practice is confusion of the reader. A case could be made, perhaps, for using guide terms as headings for minor facets within a hierarchy, for example, VC536 <*sculpture by material*>, but even that has no real advantage.

Descriptors should be formulated to explicitly convey the full meaning without reliance on the hierarchical context, lest confusion and misuse of descriptors reign. Usually AAT descriptors follow this rule, but there are enough exceptions to cause concern. For example, DC221 **automatic** refers strictly to firearms; outside its hierarchical context DC213 <*operational attributes: firearms*> this limitation is bound to get lost. FL3379 **abstract** and FL3380 **non-objective** refer only to 20th-century art, so why not say so: **20-th-century abstract art**. HG426 **religious** means members of religious orders! (The reason for some of the short — and by themselves rather cryptic — descriptors is no doubt their use in building modified descriptors that read well, such as **abstract paintings** as opposed to **nonrepresentational art paintings**, but what reads well often does not retrieve well.) BM616 **moments** has a specific meaning under BM596 <*structural analysis concepts*>; RK665 **public libraries** (under RK661 **libraries (buildings)**) is used for the meaning **public library buildings**; it would not be at all surprising for an indexer using only the alphabetical display to build the modified descriptor **public library catalogs** (there is no descriptor for the public library as an institution). For an extreme example, consider FL982 **Classic**, which is used in the meaning of "the style of the Classic Mesoamerican period" and FL2666 **Classical**, which is used in the meaning of "Greek Classical style". While these terms may be unambiguous in certain scholarly communities, they are certainly not unambiguous over the wide scope of the AAT. This points to a more general problem: Term usage was checked against the best specialized sources. Such specialized sources tend to use a specialized vocabulary that includes terms known primarily within a special field or general terms used in a specific meaning **in the special field**. Such terms are not always suitable for a broad-based thesaurus, such as the AAT, that addresses a wide audience. Here one must strive to

select or formulate terms that are immediately understood by any member of that audience and that are unambiguous not only in a narrow field but in the broad scope of the AAT. For example, TX414 **transports**, chosen as descriptor in the AAT, may be the proper technical term, but the synonym **transport ships** is certainly clearer to the general user and avoids the ambiguity with transport as an activity.

The most serious problems of non-specific term expression is found in the **Styles and Periods** hierarchy, where names for geographical places, for people, and for political units are used throughout to mean the styles associated with them. For example, under FL2333 <*Indian architecture styles*> one finds FL2334 **Dravidian** and FL2336 **Kalinga**, the name of a group of people and of an ancient kingdom in India. Again, it would not be surprising to find an indexer forming the modified descriptor **Dravidian language**.

A closely related problem is the treatment of homonyms. Ideally, all homonyms should be disambiguated with a qualifier, even if only one meaning is represented in the thesaurus. This ideal may not be fully achievable, but TK130 **morning stars** should be **morning stars (weapon)**, MT1452 **museum board** should be **museum board (material)**, and BM878 **equity** should be **equity (residual value)**. Or consider BM267 **dress** against TE1 **costume**. Scope notes inform the reader that the descriptor **dress** refers to the "Manner of dressing required by custom or etiquette for certain occasions or times of day" while **costume** refers to "Artifacts worn or carried for warmth, protection, embellishment, or symbolic purposes." (Incidentally, there is no cross-reference between the two.) Descriptors should say what they mean, so it should be **dress rules** (or **dress customs** or **dress etiquette**). Another example is the plain term VC609 **genre** which is defined as "pictorial representations . . . that represent scenes or events from everyday life; usually used with another term . . ."; there are other uses of genre in the thesaurus, such as BM160 <*genres in the arts*> or VW2 <*document genres*>.

When there are two or more meanings of a homonym represented in a thesaurus, all must be disambiguated, as in PJ3237 **slides (aerophone components)**, **slides (barrettes)** USE [TE507] **barrettes**, TV109 **slides (recreational equipment)**, VC357 **slides (photographs)** or PC84 **files (document groupings)** and TH1075 **files (tools)**. Again, there are too many cases where this was not done; for example, VC299 **positives** (meaning photographs) vs. **positives (organs)** USE [TT119] **positive organs** [musical instrument]; or MT385 **copper** [the metal] and **copper (color)**.

Often the AAT relies on the distinction between singular and plural to disambiguate homonyms. Examples:

MT2535 **organ** [of the body] vs. TT110 **organs** [musical instrument] [ALT organ]

BM212 **hagiography** [as a genre in general] [No SN] vs. VW265 **hagiographies** [document form] [SN, ALT]

KD278 **oral history** [discipline] [No SN] vs. VW289 **oral histories** [document form] [SN, ALT]

MT397 **bronze** [material] vs. VC538 **bronzes** [bronze sculptures]

To make matters worse, in many of these cases the plural descriptor has the singular as an alternate, losing the distinction altogether. These descriptors should be explicitly disambiguated through parenthetical qualifiers: **organ (of the body)** and **organs (musical instruments)** or replaced by unambiguous terms: **bronze** and **bronze sculptures** (**bronzes** is not required even as a lead-in term since the user looking for **bronzes** will certainly find **bronze sculpture**).

The use of singular and plural as separate descriptor is frequent with processes and their results as in the following example: KT673 **copper engraving** [the process] and VC643 **copper engravings** [prints made by the process of copper engraving] (with **copper engraving** as an alternate form). The descriptors should be **copper engraving (process)** and **copper engraving (print)** (or the plural forms in the AAT style).

The AAT uses parenthetical qualifiers to disambiguate homonyms, a well-accepted and useful practice. But sometimes it also uses parenthetical qualifiers when a multi-word term should be used. As an example, consider VW961 **codices (Mesoamerican)**; Mesoamerican is not used to indicate which of several meanings of codices is involved but to express a compound concept. The descriptor should be **Mesoamerican codices**. Since the AAT does not always permute on parenthetical qualifiers, VW961 does not appear under **Mesoamerican** in the alphabetical display. (RK130 **banks (buildings)** does have an entry **buildings, banks** USE banks (buildings); the descriptor should still be **bank buildings**.)

For anything that can be counted, AAT uses the plural, contrary to normal dictionary practice. A better rule is to prefer singular and use plural only where a sense of language requires it (as in a heading **research methods**).

## 6.2 Format of the hierarchical display

The hierarchical display (see Figure 2) presents descriptors (and guide terms) in a straight monohierarchical arrangement without any further information such as cross-references or scope notes. It is divided into 33 "hierarchies" grouped into 7 "facets". Each facet is preceded by a short explanation of its scope. Each hierarchy is preceded by an explanation of its scope, relationship to other hierarchies, and organization, and a synopsis of the major subdivisions. These synopses are not always easy to comprehend, which is partially a function of form and partially a function of shortcomings of the hierarchy which were discussed above. [\*\* See Figure %h for a sample synopsis]. Nevertheless, these explanations and synopses are very useful; in fact, they should all be repeated in one place as part of the introduction to give the reader an overview of the whole thesaurus at a level somewhat more detailed than the one-page overview of the facet structure in Section 4.1 of the Introduction (vol.1, p.31-32).

The hierarchical display shows hierarchical levels through indentation of about .2"; alternating gray and white vertical stripes provide guidance in identifying the correct hierarchical level — a novel feature pioneered in the first edition of the AAT. These would be even more useful, if the level number were printed in fine type across the top of the page, and if the left edge of the descriptors were aligned with the left edge of the corresponding stripe.

To keep the hierarchical context while going from one page to the next, the AAT employs two useful devices: (1) The title of the hierarchy (e.g. **PEOPLE (HG)**) and (2) the hierarchic chain leading to the first descriptor on the page (see Figure 2). The hierarchic chain is needed only on left-hand pages where the hierarchical context gets lost as one turns the page; on right-hand pages this space could be saved. On the other hand, in the AAT the chain is limited to four levels, so that the highest levels are often cut off, leaving the reader without orientation. For example, consider the hierarchical chain

HG70	<i>&lt;people by occupation&gt;</i>
HG203	<i>&lt;people in the humanities&gt;</i>
HG204	<i>&lt;people in the arts and related occupations&gt;</i>
HG205	<i>&lt;people in the arts&gt;</i>
HG257	<i>&lt;people in the visual arts and related occupations&gt;</i>
HG258	<i>&lt;people in the visual arts&gt;</i>
HG267	artists
HG288	painters (artists)
HG292	<i>&lt;painters by technique, . . .&gt;</i>
HG295	stencilers

HG295 stencilers is the first descriptor on p. 433 (vol. 1). With the four-line limit, the "hierarchical orienter" on that page is,

*<people in the visual arts>*  
 artists  
 painters (artists)  
*<painters by technique, . . .>*

The hierarchical orienters would be even more useful if the term number were given so that the reader could quickly locate the place of a high-level term in the full hierarchy.

The layout of the hierarchical display does not use typography to advantage. Using boldface large for high-level headings, bold for the next level, and regular type thereafter would make orientation **much** easier. As it is, all descriptors are bold normal and all "guide terms" (a dubious distinction anyhow) in light italics, a source more of confusion than of guidance.

Since the link from the alphabetical display to the hierarchical display is through term numbers, a running head showing the term number range on each page would be very helpful.

Descriptors are identified through numbers such as VC.160 **perspective drawings**; the dot serves no function and actually impedes readability, which is why this review omits the dot when citing term numbers.

Every page has a note at the bottom

May be used in combination with other descriptors, for example, saline + solution;  
central-plan + churches; serpentine-front + chest of drawers

The examples are the same throughout a hierarchy (up to 80 pages). This gets tiring after a while. It would seem sufficient to give a number of examples in the introduction to each hierarchy. The space used by this ever-repeated line may be justified if it alerts some users who have not read the introduction or otherwise had an orientation to the use of the thesaurus, but that is unlikely. At the very least, the examples should be varied to use descriptors from the actual page.

All but ten of the 33 hierarchies have only one top-level term, identical to the title of the hierarchy; everything else is indented under it, creating a level of indentation that does not convey information. The following example is even worse:

TX1	<transportation vehicles>
TX2	<b>vehicles</b>
	everything else indented under <b>vehicles</b>

the hierarchies with more than one top term are BM, DL, FL, PC, RD, RG, RM, TK, TT, VK. Some of these are really agglomerations of two hierarchies (e.g., PC **Object Groupings and Systems**). Others, such as FL **Styles and Periods** or TT **Sound Devices**, just follow a more sensible practice than the apparent AAT norm.

### 6.3 Format of the alphabetical display

The alphabetical display (see Figure 3) has entries for descriptors, spelling variants, permutations of multi-word descriptors, synonyms of descriptors, permutations of synonyms, and guide terms (but not permutations of guide terms). For lead-in terms it gives the descriptor, for descriptors it gives their term number in the hierarchical display and often a lot of information to be discussed below. To conserve space, the alphabetical display is arranged in three columns. Each page has a running head indicating the range of the alphabet. Unfortunately, the running head does not give whole words, as is customary in dictionaries, but only the first three letters; thus we have 13 pages com - com. (On the page proofs available for this review, the running heads are written in; one rather wonders why the pages with proper running heads were not produced by computer.)

Descriptor entries include the term number linking into the hierarchical display and, as appropriate, source indicators, **History Note**, **AL**Ternate forms of the descriptor, **Scope Note**, **Used For** terms (synonyms, permutations), and **Related Terms**, as illustrated further in Figure %f. Lines that, in the reviewer's opinion, could be dispensed with are marked with \*. We will discuss the different categories of information in turn.

The **History Notes** referring to the date when a descriptor was introduced or changed are important to the user. Historical information on other changes is important to the thesaurus editors but wastes space and distracts attention in the published version.

The **ALternate descriptor** field usually gives the singular for a plural descriptor, or vice versa, and often the possessive forms of both singular and plural, for example

**illustrators**

HG281  
ALT illustrator  
illustrator's  
illustrators'

**glassblowers**

HG694  
ALT glassblower  
glassblower's  
glassblowers'

These alternate forms are needed for the syntactically correct construction of modified (compound) descriptors, such as *illustrators' biographies* (I was tempted to use *glassblower's tools* as an example, but that is TH1134 *glassworking equipment*). A more complex example is

**Buddhism**

BM448  
ALT Buddhist

for combinations such as *Buddhist temples*. The simple rule "singular, plural, possessive, and adjective forms can be used as appropriate, especially in compound descriptors" would achieve the same objective while saving many lines.

The **Scope Notes** are extremely useful and perhaps the best feature of the AAT. Scope notes are provided for the majority of descriptors.

The **Used For** relationships fall into two classes, (1) synonyms, such as *paste-ups* for **mechanicals** and (2) permutations, such as *engraving, copper* for **copper engraving**. Synonyms are useful to the reader; they contribute to an understanding of the descriptor's meaning, particularly if the reader is more familiar with a synonym than with the descriptor itself. But permutations of multi-word terms do not add any information; as a further example consider

**artificial inorganic brown pigment**

UF brown pigment, artificial inorganic  
brown pigment, synthetic inorganic  
inorganic brown pigment, artificial  
inorganic brown pigment, synthetic  
pigment, artificial inorganic brown  
pigment, synthetic inorganic brown  
synthetic inorganic brown pigment

The only line that adds information is the last one. Of course, unless a KWOC index is used (the most elegant solution), the alphabetical display should have an entry under any of these permutations, referring to the descriptor, and the thesaurus data base must store these variant

forms with the descriptor. But listing these variations in the user version only takes up space and annoys the user. Incidentally, the permutations are not done mechanically but selected by an editor; see for example **internal dye diffusion transfer process**.

**Related Terms** (RT) are very useful, but all too rare. Example:

TC231 **mourning quilts**

RT funerary objects

(It would be helpful to make the cross-reference RT PE63 funerary objects for direct access to that descriptor in the hierarchical display.)

In any thesaurus, particularly in a thesaurus of this size one should make every effort to save space by omitting non-essential information to save both paper and the reader's time. Omitting unneeded lines from the alphabetical display would save about 320 of its 1700 pages.

A more fundamental question is where scope notes, synonyms, and related terms should be given. When this information is given in the alphabetical display, a user perusing the hierarchy must turn to the alphabetical display whenever she needs a definition - very annoying. On the other hand, a user should never use a descriptor for indexing or searching without having verified it in its hierarchical context; thus she must go from the alphabetical to the hierarchical display in any event. Moreover, the hierarchical context complements the information given in the scope note. Thus this information should be given in the hierarchical display, general practice notwithstanding.

For lead-in terms (terms that are not descriptors), the AAT refers the user to the appropriate descriptor:

**paste-ups**

USE mechanicals [better: USE VW1187 mechanicals]

**engraving, copper**

USE copper engraving [better: USE KT673 copper engraving]

Giving the descriptor number in the USE cross-reference would let the user go directly to the hierarchical display without a second look-up in the alphabet.

Guide terms are not permuted in the alphabetical display. Thus

DC213 <operational attributes: firearms>  
(including terms such as **recoilless, automatic**)

does not appear under

<firearms, operational attributes>.

KT662 <photomechanical processes: planographic>

does not appear under

<planographic photomechanical processes>;

the user looking under **planographic** finds only references to **planographic printing**.

## 7 Introductory matter

Volume 1 contains some introductory matter, but the real introduction is found in the separate Volume 6. While the lengthy history in volume 1 transmits some of the "flair" of the thesaurus and perhaps helps one understand how its structure came about, it is not essential and should be omitted in the interest of space. The introduction that follows elaborates on the editorial principles of the AAT and . . . \*\*. Fortunately, there is a good introduction to be found in volume 6, Chapters 2 and 3; they are must reading if one wants to understand the AAT's structure and use. The chapters describing the application of the AAT in specific environments, such as archives, museums, or visual resources collections, are also quite useful.

Chapter 3 gives the rules for entering AAT indexing into MARC records. For example, the modified descriptor

Rococo carved gilded wood chairs

is entered into MARC field 656 with the individual elements marked with subfield codes consisting of two parts, a facet indicator and

Facet (MARC code)	Descriptor no. and text	
F Style & Period (#cf)	FL3265	Rococo
K Activities1(#ck)	KT911	carved
K Activities (#ck)	KT139	gilded
M Materials (#cm)	MT2670	wood
T Objects (#ct)	TC449	chairs



Elements are combined in the sequence of the AAT facets; elements for the same facet are arranged alphabetically. (In the example, *Rococo gilded carved wood chairs* would make more sense, joining the technique applied first more closely to the object.)

In a MARC record, this can be entered as follows:

```
654  #cf#bRococo #ck#bcarved #ck#bgilded #cm#bwood #ct#achairs
```

where #a means focus term (which states the class to which the item belongs and #b modifier (which describes a property that distinguishes the item from others in the class). The facet indicator codes are redundant, since the facet of a descriptor is always the same and known from the AAT. On the other hand, if the role of an element within a modifier could be determined independently from the facet to which the element belongs, or if non-AAT elements, such as geographical names and time periods were allowed, role indicator codes would be useful.

## 8 Examination of individual hierarchies

The **Associated Concepts facet** (B) with one hierarchy of the same name containing 1,018 descriptors is not really a facet, but rather an assembly of concepts for which the editors could find no suitable place in the overall scheme. This hierarchy is the most poorly organized, with many questionable descriptor placements.

The **Physical Attributes facet** (D) consists of four hierarchies with a total of 890 descriptors. **Attributes and Properties** (353 descriptors) contains many useful groupings. Many descriptors from Associated Concepts would fit in here, avoiding the scatter of related concepts over different areas. For example, physical science concepts are also in both places, such as BM740 **dew point**, which should be under DC366 **thermal properties**. Why separate BM658 *<geometric figures>* and DC56 **shapes**? On the other hand, DC78 *<shape: furniture>* or DC111 *<size: photograph formats>* would be better off with their subjects, as discussed above. **Conditions and effects** (46 descriptors) refer mostly to states of deterioration; many similar concepts are found in the Processes and Techniques hierarchy (the descriptors there are used for both processes and for their results).

**Design Elements** (162 descriptors) refer "to conventionalized and recurring shapes and arrangements of forms". Why not consolidate all descriptors for two- and three-dimensional shapes, including PE31 *<object genres by form>* and shapes implied elsewhere (MT Materials, other object hierarchies), in this one place?

**Color** (329 descriptors) is the lone example of a hierarchy with a well-developed microstructure. Starting at DL32 chromatic colors are arranged in rainbow sequence, and shades/hues/tints under each main color follow a standard scheme. What is still missing are cross-references, a consequence of the fictitious assumption that concepts can be arranged in a monohierarchy in which each concept has one and only one place. This assumption breaks down even in a simple hierarchy such as colors. Where should DL258 **bluish gray** go? In the AAT it is listed under

**blue**, but there should be a Narrower Term (or at the very least a Related Term) cross-reference under DL332 **gray (color)**. In the AAT there is no such cross-reference. A user wanting to search for all grays (**pinkish gray, reddish gray, dark reddish gray, yellowish gray, olive gray, light olive gray, greenish gray, bluish gray, light bluish gray, dark bluish gray, purplish gray, light purplish gray, dark purplish gray**) will have to compile the list herself by either looking through all the colors or through the many terms under **gray** in the alphabetical display (100 terms, including terms such as gray birch, gray blue, gray burnished ware). This structure does not support automatic hierarchic expansion of the search term **gray (color)**.

The **Styles and Periods facet** contains one hierarchy of the same name with 3,382 descriptors. "The Styles and Periods hierarchy contains the names of art and architecture styles, historical periods, and art movements. Names of peoples, cultures, individuals, and sites are included only if they designate distinct styles or periods (e.g., **Yoruba, Louis XIV**). Geographic descriptors are included only for broad cultural regions." Style is thus defined in this facet as a phenomenon in space and time. (Descriptors characterizing style in more abstract terms can be found in Associated Concepts and elsewhere but are not systematically grouped together.) Thus most style concepts are compound, with a component for a geopolitical/geocultural area or a people (the AAT uses the term region) with a component for a time period and sometimes a subdivision of art as a third component. These elements are often dependent on each other (time periods differ from one culture to another, geopolitical/geocultural units and peoples arise and disappear in time), making for a complex structure. Thus the simplest solution, separate facets for space/peoples and for time periods from which the user creates combinations, does not work. Nevertheless, a hierarchy of styles and periods must manage the dual classification in an explicit way so that searching is possible from both a space/people and a time perspective. The AAT has two major subdivisions, FL1 <*styles and periods by general era*> (very short, just 29 descriptors, ending with FL29 **Iron Age**, there apparently being no general eras after that) and FL33 <*styles and periods by region*> (the remaining 3,353 descriptors, including FL3840 <*international post-1945 styles and movements*>, where the region spans the globe). Regions are often, but not always, subdivided by time periods, without any cross-references to the closest general time periods, nor are there cross-references within, such as FL175 <*West African styles*> NT FL75 <*ancient West African styles and periods*>; as a result, one cannot do an hierarchically expanded search for <*West African styles*>. The method (or lack thereof) of arranging styles and periods is best shown through the illustrative excerpt in Figure %g.

The example also illustrates that many of the style descriptors take their meaning only from the context; they cannot stand by themselves. They are furthermore inconsistent, sometimes including the word *styles* and sometimes not. Style descriptors should be formulated more explicitly; where appropriate, addition of an approximate time range, such as [200 BCE - 100 CE], would be very, very helpful.

From the definition of the **Styles and Periods** facet one might assume that the descriptors should be used only for arts (including crafts) and architecture styles. Yet in the Guide to Indexing one finds examples that suggest a broader usage. Consider the following "access points from the AAT"

Dakota customs (FL1412 **Dakota** + BM265 **customs**)  
 Dakota language (FL1412 **Dakota** + BM1015 **language**) (vol. 6, p. 98)

FL1412 **Dakota** is a descriptor under FL1383 <Plains Native American Styles>.

Or consider this example:

Canadian manuscripts (FL728 **Canadian** + VW958 **manuscripts**) (vol. 6, p. 46)

Could it be that these descriptors have been taken from the alphabetical index at face value rather than in their real meaning that can be seen only from the context of the hierarchy?

The **Agents facet** (H, 1,093 descriptors) consists of two hierarchies, HG **People** (958) and HN **Organizations** (135). The **People** hierarchy is really a collection of separate facets, each characterizing people from a different perspective:

HG12	<b>social classes</b>
HG32	<groups of people by state or condition>
HG47	<people by age group>
HG54	<people by family relationship>
HG67	<people by gender>
HG70	<people by occupation>
HG878	<people by degree of qualification>
HG892	<people by activity> (e.g., HG928 <b>lovers</b> or HG953 <b>spectators</b> )
HG970	<people by ideology, philosophy, or political activity>
HG991	<people by state or condition> (mixing up several facets)

This is a good approach, even though some aspects are missing (for example, *by sexual orientation, by racial/ethnic origin, by religious affiliation, by type of residence*. As discussed above, <people by occupation> is essentially a classification of fields and disciplines. If the thesaurus were to include such a classification with sufficient coverage, all these concepts could be built by combination. At the very least, HG70 <people by occupation> and KD **Disciplines** should be articulated with each other.

HN **Organizations** contains a rather unstructured list of organization types at a fairly general level. The **Buildings** hierarchy (RK) contains more detailed breakdowns of buildings by organization type than HN. For example, HN contains just HN131 **library service agencies**, while RK661 **libraries (buildings)** has several subdivisions by type of library. Banks does not appear at all in HN, but only as RK130 **banks (buildings)**.

The **Activities facet** (K, 2,034 descriptors) consists of four rather small hierarchies: KD **Disciplines** (318), KG **Functions** (287), KM **Events** (177), KQ **Physical activities** (87), and one large and important hierarchy, KT **Processes and techniques** (1,165). KD **Disciplines** is much more limited than the classification of fields and disciplines implied by HG70 <people by occupation>. KG **Functions** has many functions that might be better grouped with the subject,

such as KG70 **economic development** or KG106 <*information handling functions*>. Some of the generalized functions, such as KG174 **protecting**, including, among others, KG178 **flood control** and KG181 **preservation** are useful abstractions across subject areas and would be preserved through cross-references even in a subject-based arrangement. KM and KQ are useful groupings, they just need better organization.

KT **Processes and techniques** contains many useful groupings, such as KT347 <*image-making processes and techniques*> or KT978 <*surface-marking processes and techniques*>. The overall organization could be improved, and there is overlap with other areas (see the discussion above on the relationship between processes and equipment).

The **Materials facet** consists of one large hierarchy of the same name, MT Materials (2,869). For a list of types of marble, or types of pigment, or any other building or arts and crafts material, this is the place to look. Materials can be organized from several viewpoints, resulting in several facets: by composition, by physical state, by origin, and by function or property. If this is done properly, it results in four different hierarchies, each organizing **all** materials from one of these perspectives. This would normally be done as follows: Establish a primary hierarchy, most sensibly by composition. Establish a hierarchy of material functions and properties, and under each function or property refer to the relevant materials in the primary hierarchy. Do the same for origin and form, if needed. The AAT, on the other hand, has one hierarchy with the headings

- MT2            <*materials by composition*>
- MT1370       <*materials by form*>
- MT1673       <*materials by function*>
- MT2513       <*materials by origin*>            (plant, animal)
- MT3066       <*materials by property*>

A material is listed only once in this hierarchy, without cross-references. In this hierarchy a facet is often applied at a lower level, for example, under MT2 <*materials by composition*> one finds these groupings:

- MT53            **clay**
- MT54            <*clay by composition or origin*>
- MT66            <*clay by function*>
- MT67            **bole**
- MT68            **fireclay**
- MT69            **potter's clay**
  
- MT686          **marble**
- MT687          <*marble by composition or origin*>
- MT690          <*marble by form or function*>
- MT711          <*marble by color or pattern*>
- MT712          **black marble**
- MT713          **Belgian black marble** [a subdivision by origin!]

Conversely, a class of materials under MT1673 <*materials by function*> is often subdivided further by composition, for example

MT1844	<b>coating (material)</b>
MT1845	< <i>coating by composition or origin</i> >
MT1846	<b>bituminous coating</b>
MT1847	<b>enamel</b>
MT1852	<b>plaster</b>

Note: There is no cross-reference from MT993 **bituminous material** to MT1846.

Many of the actual functions mentioned in MT do not appear in KG **Functions**.

Many of the MT descriptors, especially descriptors listed under MT1370 <*materials by form*> or under form subdivisions at lower levels of the hierarchy, such as MT71 **brick**, MT156 **ceramic tile**, MT1540 **yarn**, may be considered objects or components of objects, as was discussed above. There should at least be cross-references.

The **Objects facet** (P/V 13,210 descriptors) is by far the largest. Its overall arrangement is problematic. As we discussed above, an arrangement by formal criteria, such as object groupings, components, and single objects, disperses concepts in the same subject area that would be more helpful together. Even if one accepts the general approach, there are problems with the sequence. It starts with large assemblies of objects — PC Object groupings and systems (202), moves on to the small — PJ Components (3,066), and then to the medium — many hierarchies of single objects. Components - Objects - Systems would be a much more sensible sequence.

PE Object genres (154) is a hodgepodge. PE31 <*object genres by form*> should be consolidated with shapes. PE97 <*object genres by material*> duplicates MT Materials; consider, for example, the following descriptors: MT148 **ceramic**, MT155 <*ceramic products*>, PE102 **ceramics**.

PJ Components is a problematic hierarchy because component is not an absolute classification but rather a relationship: A is a component of B. Thus classification here rather than in one of the other object hierarchies is bound to be somewhat arbitrary. The components are grouped, by and large, by the groupings of objects that follow, but these groupings are given in a different sequence. There are good elements in here, such as a exhaustive classifications of PJ18 **fasteners**, other PJ281 **hardware**, and PJ615 **joints (connections)**. On the other hand, it is quite strange to find PJ3432 <*script and type forms*>, including a very incomplete list of PJ3434 **scripts (writings)** (Arabic, cuneiform, hieroglyphics, etc.), under PJ3336 <*information artifact components*>. Incidentally, there is no lead-in term **alphabet** for PJ3434.

R **Built environment** (1,943) is a group of four hierarchies, including natural landscapes, so the title is slightly misleading: RD Settlements and landscapes (241), RG Built complexes and districts (287), RK Single built works (1,185), RM Open spaces and site elements (230). RD225 **plants** gives a very perfunctory classification of plants as landscape elements, including RD241

**trees.** An extensive list of specific trees are found in the materials hierarchy under MT2670 **wood**, so one would assume that a descriptor such as MT2961 **pine** refers to pine wood. Also, under MT2670 trees are selected and arranged according to the wood they provide; for example, ornamental cherry is not included. One is therefore surprised to read in the introduction to RD that "Descriptors referring to individual plants and trees are found in the Materials hierarchy (e.g., **bamboo, pine**)", leading one to assume that **pine** is to be used also if this tree is used as a landscaping element. Clearly, plants need to be arranged in their own hierarchy.

With placing **Built complexes and districts** here rather than under PC **Object groupings and systems**, the AAT takes a welcome departure from an arrangement based more on form than on substance. The subdivision of **Single built works** lists a large number of building types (many precombined), arranged according two main principles, *<by form>* and *<by function>*, with other principles used here and there. These principles are applied in nested fashion, as in the following example:

RK40	<i>&lt;single built works by function&gt;</i>
RK41	<i>&lt;agricultural structures&gt;</i>
RK42	<b>agricultural buildings</b>
RK43	<b>barns</b>
RK44	<i>&lt;barns by form&gt;</i>
RK45	<b>crib barns</b>
RK48	<i>&lt;barns by function&gt;</i>

Forms are often not expressed as general geometric form, but by a specific term in the context, such as **crib barn**.

T **Furnishings and equipment** (5,592 descriptors) groups the 9 hierarchies shown in Figure 1. They are arranged in no particular order (a more meaningful order would be Costume, Furnishings, Containers, Sound devices, Tools and equipment, Weapons and ammunition, Recreational artifacts, Transportation vehicles. As in most hierarchies, there are useful assemblies of descriptors here, such as any conceivable type of rug or quilt, or chair.

TH **Tools and equipment** has, among others, the subdivisions

TH416	<i>&lt;equipment by process&gt;</i> ,
TH1100	<i>&lt;equipment by profession or discipline&gt;</i>
TH1116	<i>&lt;equipment by material processed&gt;</i>

These are not articulated with **KT Processes and techniques**, **KD Disciplines**, and **MT Materials**, respectively.

TT **Sound devices** has as first subdivision TT1 *<sound devices by acoustical characteristics>*, which is a detailed classification of musical instruments with useful groupings. One is surprised,

therefore, to find TT629 **musical instruments** under TT623 <*sound devices by function*> with just a few terms for instruments and instrument classes not covered under TT1. The user approaching this from the entry **musical instruments** in the alphabetical display would be quite baffled to see the meager listing under TT629, particularly since there is no cross-reference to the place where the musical instruments are actually found.

V **Visual and verbal communication** (1,853 descriptors) should be titled Visual and verbal communication **objects**. The first of three hierarchies in this group is VC **Visual works** (574). It is subdivided using the following minor facets:

- VC2     <*visual works by form*>
- VC34    <*visual works by function*>
- VC70    <*visual works by location or context*>
- VC75    <*visual works by medium or technique*>
- VC601   <*visual works by subject type*>

Descriptors under VC75 are often subdivided by using one of the other four facets at a lower level, often in nested fashion; there are many precombined descriptors. For example, VC570 **statues** (under VC565 <*sculpture by subject type*>) has the component VC605 **figures (representations)**. On the other hand, a figure in relief would need to be expressed as the combination VC605 **figures (representation)** + VC561 **reliefs**. A sculptured (in the round) bust would be VC606 **busts** + VC570 **statues**; if the indexer were to choose instead VC606 **busts** + VC564 **sculpture in the round**, a perfectly logical combination also, the item would not be found under **statues**. There are no descriptors under VC601 <*visual works by subject type*> that would correspond to VC572 **equestrian sculpture** or VC582 **terms (sculpture)**. Furthermore, from the introductory material it is clear that any descriptor for an object can be combined with **paintings** or **sculpture** etc. to index a representation of that object, but there is no such note under VC601. These are just examples of lacking conceptual analysis. Under VC252 **paintings** there are no precombined descriptors implying a subject; the indexer always must form a combination, a much cleaner approach.

The descriptors in VC75 <*visual works by medium or technique*> all have a component from KT **Processes and techniques**, but articulation between the classifications is again lacking or incomplete. For example, in KT, KT802 **sculpture techniques** is under KT675 <*object-making processes and techniques*>, not under KT347 <*image-making processes and techniques*>. VC sometimes lists a few precombinations, such as 8 descriptors under VC272 <*paintings by material or technique*>, while KT415 **painting techniques** has 39 narrower descriptors; the indexer must use an existing precombined descriptor and build a combination otherwise, but again there is no cross-reference from <*paintings by material or technique*> to **painting techniques**. The organization of VC283 **photographs** was discussed in section 5.1 (see Figure %a).

VK **Exchange media** (169) is a short hierarchy devoted mainly to coins. We have commented in section 5.2.3 that coins within a group, such as VK56 <*Later Western World Coins*> are arranged alphabetically by name, not by country or money system.

VW **Information forms** (1,110) is an important and extensive hierarchy. It is divided into VW2 <document genres> and VW988 <information artifacts>. <document genres> "identify types of text or other intellectual content regardless of what type of physical artifact contains them. These items can be complete in themselves or parts of larger wholes . . .". An extreme case of the latter is presented by VW407 **marks (symbols)**, such as VW434 **brick stamps** or VW436 **glass marks**, which would not ordinarily be considered document genres. <document genres> is subdivided by the minor facets *by form*, *by function*, and *by conditions of production*, which are applied in a nested fashion. It seems strange to find here descriptors such as VW630 **cost reimbursement contracts**. By the facet arrangement principle used in the AAT, VW238 <document genres by form: partial documents> should be under PJ **Components**; it is, of course, more helpful here. The relationship between BM201 <literary and oral genres> (no scope note) and VW259 <document genres for literary works> is presumably that the former is used to index a document **about** a genre and the latter to index a document that **is a specimen of** a genre. The list under BM201 is much shorter than the list under VW259.

BM202      **comedy** (no SN)

"<information artifacts> collocates descriptors for the physical artifacts and objects through which specific information is recorded or conveyed . . .". However, the distinction to <document genres> is not — and perhaps could not be — strictly maintained. For example, VW48 **atlases** (under <document genres>) are, by definition, VW991 **books** (under <information artifacts>); there is no cross-reference. On the other hand, VW1033 **globes (cartographic spheres)** under VW989 <information artifacts by physical form> belong to the genres VW47 **cartographic materials**; in this example there is a cross-reference to remind the user.

Volume 6 elaborates further on the relationship of document genre and physical form. "As Zinkham et al. note: 'Form, genre, and physical characteristics are similar to each other in that each names object types or features rather than a specific subject matter' (Zinkham, 303). Form is largely determined by physical characteristics, such as the way the contents are structured or organized, as in diaries, account books, or directories. Genre is used to identify certain styles and techniques, like biographies, essays, or portraits, that can appear in many extant records" (vol.6, Ch. 5, Section 3.6.4). The only way to solve this problem is to acknowledge the overlap through extensive cross-references.

There is the larger problem of the overlap — in the real world — between VC **Visual works** and VW **Information forms**. Many, if not most, visual works convey information, and most information forms convey information through visual means. The AAT attempts a distinction with the following definitions: "The Visual Works hierarchy contains descriptors for items that were originally created for the purpose of communicating meaning primarily visually and nonverbally, especially those communicating a symbolic or expressive meaning or an aesthetic experience." Information Forms, on the other hand, includes "descriptors for items that communicate by visual, nonverbal means, but whose purpose is primarily informational" (Introduction to the visual works hierarchy, vol.2, p. 478) As an example of the difficulty of separating these, consider VC118 **plans (drawings)** (including such descriptors as VC120 **site plans**, VC127 **floor plans**) in the **Visual works** hierarchy against VW47 <cartographic



*materials*> (including **maps** and **atlases**) in the **Information forms** hierarchy. Or consider other descriptors under VC83 **drawings**, e.g., VC189 **technical drawings**, VC232 **electrical drawings** (drawings of electrical systems). Some of the descriptors under VW988 <*information artifacts*> can be used equally well to characterize the "physical container" of visual works. What is needed here is a careful conceptual analysis of the whole area of **Visual and verbal communication objects** to identify commonalities and extract facets that apply across all of these. While many of the general concepts arrived at through such an analysis and abstraction might be very useful for cross-disciplinary searching, they might not pass the literature-bound descriptor verification applied in the AAT.

## 9 Availability

The AAT is available in print form (reviewed here), in an electronic version intended for indexers and searchers, the *Art and Architecture Thesaurus, Authority Reference Tool<sup>R</sup> Edition, Version 2.0 (AAT:ART)* (vol. 6, p. 77), and in two electronic "systems" editions intended for use in conjunction with authority control, the *Art and Architecture Thesaurus, USMARC FORMAT (AAT:USMARC)* and the *Art and Architecture Thesaurus, Authority Record Edition (AAT:REC)* (vol. 6, p. 74). The two electronic "systems" editions contain information about the mapping from terms in the main AAT sources to the corresponding AAT descriptors.

## 10 Conclusion

The AAT assembles a large number of carefully verified concepts and terms spanning a broad scope and structures them into many useful groupings. This is a significant achievement. On the other hand, the structure of the AAT hierarchy has some significant drawbacks that hamper the full exploitation of this achievement:

- The hierarchy is arranged by formal facets rather than by subject, which might be more helpful. Even so, the facet analysis is not complete, and the thesaurus contains many precombined descriptors without the necessary cross-references to their elements.
- The structure is a monohierarchy that omits crucial relationships among descriptors and thus does not do justice to the complexity of the broad field of art, architecture, and material culture with its multifaceted perspectives, interrelationships, and intersections.
- Descriptors on the same level are arranged in alphabetical rather than meaningful order.
- Hierarchies that should be parallel are not articulated with each other.

To realize the full potential of the AAT for indexing and searching requires a painstaking and thorough structuring and restructuring of the hierarchy to create a polyhierarchical network of concept relationships, a rich tapestry of interwoven threads, and displaying this network in the arrangement most helpful to the user.

**B Associated concepts facet (1,018)**

BM Associated concepts (1018)

**D Physical attributes facet (890)**

DC Attributes and properties (353)

DE Conditions and effects (46)

DG Design elements (162)

DL Color (329)

**F Styles and periods facet (3,382)**

FL Styles and Periods (3,382)

**H Agents facet (1,093)**

HG People (958)

HN Organizations (135)

**K Activities facet (2,034)**

KD Disciplines (318)

KG Functions (287)

KM Events (177)

KQ Physical activities (87)

KT Processes and techniques (1,165)

**M Materials facet (2,869)**

MT Materials (2,869)

**P/V Objects facet (13,210)**

PC Object groupings and systems (202)

PE Object genres (154)

PJ Components (3,066)

**R Build Environment (1,943)**

RD Settlements and landscapes (241)

RG Built complexes and districts (287)

RK Single built works (1,185)

RM Open spaces and site elements (230)

**T Furnishings and equipment (5,592)**

TC Furnishings (1,363)

TE Costume (721)

TH Tools and equipment (1,463)

TK Weapons and ammunition (256)

TN Measuring devices (315)

TQ Containers (622)

TT Sound devices (607)

TV Recreational artifacts (183)

TX Transportation vehicles (462)

**V Visual and verbal communication (1,853)**

VC Visual works (574)

VK Exchange media (169)

VW Information forms (1,110)

Numbers in parentheses give the number of descriptors to indicate emphasis.

Figure 1. Top-level outline

\*\* To be developed if needed. Needs to be adjusted to page size of journal

Figure 2. **Sample page from the hierarchical display**

\*\* To be developed if needed. Needs to be adjusted to page size of journal

Figure 3. **Sample page from the alphabetical display**

VC1	<visual works>
VC2	<visual works by form>
VC34	<visual works by function>
VC70	<visual works by location or context>
VC75	<visual works by medium or technique>
VC283	<b>photographs</b>
VC284	<photographs by form>
VC285	negatives
VC289	<negatives by color>
VC290	black-and-white negatives
VC291	color negatives
VC292	<negatives by process>
VC295	gelatin silver negatives
VC299	positives
VC310	photographic prints
VC312	later prints
VC315	<photographic prints by color>
VC316	black and white prints (photographs)
VC317	color prints (photographs)
VC318	<photographic prints by process>
VC322	chromogenic color print
VC346	<photographs by form: color>
VC347	black-and-white photographs
VC348	color photographs
VC349	<photographs by form: format>
VC357	slides (photographs)
VC358	black-and-white slides
VC359	color slides
VC360	<photographs by function>
VC363	news photographs
VC364	<photographs by technique>
VC365	<photographs by picture-taking technique>
VC366	aerial photographs
VC381	<photographs by processing or presentation technique>
VC390	manipulated photographs
VC391	composite photographs
VC400	<photographs by subject type>
VC406	studio portraits

Figure %a. Example for minor facets and precombined descriptors

<b>Facet</b>	<b>Sample descriptors</b>
physical attributes	quarter plate, opacity, vivid red
styles and periods	Rococo
agents	painters (artists), photographers
activities and processes	gilding, gelatin silver process, color photography, carving, deterioration
materials	color film, wood
objects	chairs, negatives

Figure %b. **Facets and sample descriptors**

<art genres>

academic art  
amateur art  
apocalyptic art  
art brut  
children's art  
commercial art  
community art  
SN Includes art undertaken in conjunction with particular communities, often socially deprived, usually with the idea of producing an effect or inspiring response specifically within those communities, with no reference to widely established standards. For art intended to beautify or enrich public places, use **public art**.

computer art  
court art  
crafts  
cybernetic art  
didactic art  
dissident art  
ethnic art  
fantastic art  
figurative art  
folk art  
funerary art  
naive art  
nonrepresentational art  
primitive art  
public art  
SN Use for art whose purpose is to beautify and enrich public places. For art undertaken in conjunction with particular communities, usually to produce an effect or inspire response specifically within those communities, use **community art**.

rock art  
cave art  
serial art  
sofa art  
street art

a. Original alphabetical sequence

art genres

**art genres by content or other intrinsic characteristics**

figurative art  
fantastic art  
apocalyptic art  
nonrepresentational art  
cybernetic art  
serial art  
crafts

**art genres by standard**

academic art  
folk art  
dissident art

**art genres by type of artist or origin**

amateur art  
naive art  
art brut  
children's art  
computer art  
ethnic art  
primitive art

**art genres by audience, purpose, or display context**

sofa art  
court art  
public art  
SN Art whose purpose is to beautify and enrich public places.  
community art  
SN Public art undertaken in conjunction with particular communities, often socially deprived, usually with the idea of producing an effect or inspiring response specifically within those communities, with no reference to widely established standards.

street art  
rock art  
cave art [prehistoric, esp. paleolithic]  
didactic art  
commercial art  
funerary art

b. Suggested meaningful sequence

Figure 7. Alphabetical vs. meaningful sequence on same hierarchical level

## Photography

### D Physical Attributes Facet, DC Attributes and Properties

DC111 <*size: photograph formats*>

DC116 quarter plate

### D Physical Attributes Facet, DE Conditions and Effects

DE38 <*conditions and effects: photography*>

DE39 oxidative-reductive deterioration

### H Agents Facet, HG People

HG299 photographers

### K Activities Facet, KT Processes and Techniques

KT487 <*photography and photographic processes and techniques*>

KT503 photographic processes

KT526 gelatin silver process

KT567 <*photographic techniques*>

KT570 <*picture-taking techniques*>

KT571 chronophotography

KT598 <*photographic processing and presentation techniques*>

KT602 enlarging

KT616 reduction (photography)

### M Materials Facet, MT Materials

MT1416 paper

MT1463 <*paper by function*>

MT1481 photographic paper

MT2364 photographic materials

MT2367 photographic film

### P/V Objects Facet, TH Tools and Equipment



TH746 photographic equipment  
TH747 <cameras and camera accessories>  
TH788 <photographic processing equipment>  
TH794 enlargers  
[no reducers]

**P/V Objects Facet, VC Visual Works**

VC283 photographs  
VC284 <photographs by form>  
VC285 negatives  
VC292 <negatives by process>  
VC295 gelatin silver negatives  
VC364 <photographs by technique>  
VC364 <photographs by picture-taking technique>  
VC367 chronophotographs

Figure %d. **Facet arrangement dispersing concepts from same subject area.**  
a. **Hierarchy excerpts concerning the subject Photography**

## Firearms

### **D Physical Attributes Facet, DC Attributes and Properties**

- DC157    <*form attributes: firearms*>  
 DC159        multibarreled  
 DC163        single-barreled
- DC213    <*operational attributes: firearms*>  
               No cross-reference from TK135 firearms
- DC218        recoilless  
 DC220        self-loading  
 DC221        automatic

### **H Agents Facet, HG People**

- HG788        gunsmiths

### **M Materials Facet, MT Materials**

- MT2313    <*explosive and incendiary materials*>  
 MT2315        gunpowder

### **P/V Objects Facet, PJ Components**

- PJ3156    <*firearm components*>  
 PJ3157        <*barrels and barrel components*>  
 PJ3158        barrels (firearm components)  
 PJ3175        <*locks and lock components*>  
 PJ3176        locks (firearm components)

### **P/V Objects Facet, TK Weapons and Ammunition**

- TK135        firearms

### **P/V Objects Facet, TV Recreational Artifacts**

- TV63        sporting firearms

Figure %d. **Facet arrangement dispersing concepts from same subject area.**  
 b. **Hierarchy excerpts concerning the subject Firearms**

## Religion

The facet headings are omitted in this example to save space

- BM16     **religious symbolism**  
 BM217    **religious drama**  
 BM446    <*religions and religious concepts*> [poorly organized]
- HG391    <*people in religion and related occupations*>  
 HN28     <*religious divisions*> [e.g., dioceses]
- KD83     <*religion and related disciplines*>  
 KG300    <*religious functions*> (e.g., **baptizing**) (only 4)  
 KM36     <*religious ceremonies*> (e.g., **baptism**)  
 KM101    <*religious holidays*> [only Christian and Jewish]  
 KM168    <*religious events*> (e.g., **beatification**)  
 KM172    <*religious seasons*>
- PC52     **communion sets**  
 PE64     **religious objects**  
 PE68     **sacred objects**  
 PE69     **church plate**  
 PJ1245   <*religious building spaces*> [i.e., rooms and spaces in religious buildings]  
 PJ1363   **church towers**  
 PJ2510   <*religious building fixtures*>
- RG32     **church yards**  
 RG166    **religious camps**  
 RG201    **religious communities**  
 RG266    <*religious districts*>  
 RK329    <*houses for clergy*>  
 RK391    **religious museums**  
 RK776    **madrasas** [buildings]  
 RK779    **rabbinical seminaries** [buildings]  
 RK781    **Sunday schools** [buildings]  
 RK783    **theological seminaries** [buildings]  
 RK1025   <*religious structures*>

TC244	<b>Bible quilts</b>
TC344	<i>&lt;coverings and hangings for religious building fixtures&gt;</i>
TC1130	<b>communion tables</b>
TC1328	<b>Hanukkah lamps</b>
TC1335	<b>Sabbath lamps</b>
TQ148	<i>&lt;liturgical containers&gt;</i>
VC48	<i>&lt;religious visual works&gt;</i>
VC524	<b>reliquary figures</b>
VK195	<b>communion tokens</b>
VW9	<b>religious calendars</b>
VW704	<b>church records</b> under VW3 <i>&lt;document genres by function&gt;</i>
VW881	<i>&lt;religious texts&gt;</i> under VW3 <i>&lt;document genres by function&gt;</i>

Figure %d. **Facet arrangement dispersing concepts from same subject area.**  
**c. Hierarchy excerpts concerning the subject Religion**

VW169	<b>lists</b>	VW259	<i>&lt;document genres for literary works&gt;</i>
VW170	<i>&lt;lists by form or function&gt;</i>	VW260	<b>allegories</b>
VW171	<b>attendance lists</b>	VW261	<b>bestiaries</b>
VW172	<b>bibliographies</b>	VW262	<b>biographies</b>
VW173	<b>annotated bibliographies</b>	VW263	<b>autobiographies</b>
VW174	<b>national bibliographies</b>	VW264	<b>collective biographies</b>
VW175	<b>selective bibliographies</b>	VW265	<b>hagiographies</b>
VW176	<b>subject bibliographies</b>	VW266	<b>comedies</b>
VW177	<b>bibliographies of bibliographies</b>	VW267	<b>commentaries</b>
VW178	<b>local bibliographies</b>	VW268	<b>dialogues</b>
VW179	<b>systematic enumerative bibliographies</b>	VW269	<b>epigrams</b>
VW180	<b>trade bibliographies</b>	VW270	<b>essays</b>
VW181	<b>checklists</b>	VW271	<b>fables</b>
VW182	<b>discographies</b>	VW272	<b>fairy tales</b>
VW183	<b>filmographies</b>	VW273	<b>folk tales</b>
VW184	<b>inventories</b>	VW274	<b>legends</b>
VW185	<b>mailing lists</b>	VW275	<b>histories</b>
VW186	<b>menus</b>	VW276	<b>annals</b>
VW187	<b>registers (lists)</b>	VW277	<b>case histories</b>
VW188	<b>cartularies</b>	VW278	<b>chronicles</b>
VW189	<b>rosters</b>	VW279	<b>genealogies</b>
VW190	<b>shelf lists</b>	VW280	<b>genealogical tables</b>
VW191	<b>subscription lists</b>	VW281	<b>pedigrees</b>
VW192	<b>union lists</b>	VW282	<b>memoirs</b>
VW193	<b>want lists</b>	VW283	<b>monographs</b>
VW194	<i>&lt;lists by subject&gt;</i>	VW284	<b>myths</b>
VW195	<b>donor lists</b>	VW285	<b>narratives</b>
VW196	<b>guest registers</b>	VW286	<b>novellas</b>
VW197	<b>visitors' books</b>	VW287	<b>novels</b>
VW198	<b>job lists</b>	VW288	<b>nursery rhymes</b>
VW199	<b>membership lists</b>	VW289	<b>oral histories</b>
VW200	<b>passenger lists</b>	VW290	<b>parables</b>
VW201	<b>ships' passenger lists</b>	VW291	<b>poems</b>
VW202	<b>price lists</b>	VW292	<b>elegies</b>
VW203	<b>tariff schedules</b>	VW293	<b>prayers</b>
VW204	<b>reading lists</b>	VW294	<b>litanies</b>
VW205	<b>voters' lists</b>	VW295	<b>proverbs</b>
VW206	<b>wine lists</b>	VW296	<b>reminiscences</b>
		VW297	<b>romances</b>
		VW298	<b>short stories</b>
		VW299	<b>tracts (documents)</b>
		VW300	<b>tragedies</b>
		VW301	<b>treatises</b>

Figure %e. **Additional examples of arrangements needing improvement**

**mechanicals**

- VW.1187  
 HN March 1993 descriptor added  
 \* ALT mechanical  
 SN Copy prepared for  
 photographing to make a  
 printing plate, consisting of  
 such elements as text, titles, and  
 artwork that have been  
 arranged, pasted, and marked.  
 UF paste-ups

**copper engraving**

- KT.673 (L,R)  
 HN March 1991 descriptor added  
 SN Process of engraving for  
 printing using copper plates;  
 replaced in the early 19th  
 century by the use of more  
 durable plates, either of steel or  
 of steel-faced copper  
 UF chalcography  
 copperplate engraving  
 \* engraving, copper  
 \* engraving, copperplate

**barrel vaults**

- PJ.1875 (B)  
 \* HN March 1993 descriptor moved  
 \* May 1991 scope note changed  
 \* May 1991 lead-in term added  
 \* May 1991 lead-in term deleted,  
 was  
 \* transverse barrel vaults

- \* May 1991 lead-in term deleted,  
 was  
 \* vaults, transverse barrel  
 \* ALT barrel vault  
 SN Vaults of plain, semicircular  
 cross section supported by  
 parallel walls or arcades. (DAC)  
 UF cradle vaults  
 tunnel vaults  
 \* vaults, barrel  
 \* vaults, cradle  
 \* vaults, tunnel  
 \* vaults, wagon  
 \* vaults, wagonhead  
 wagon vaults  
 wagonhead vaults

**bluish gray**

- DL.258  
 UF aqua gray  
 baby blue  
 \* black, blue  
 \* blue, baby  
 \* blue, black  
 blue black  
 blue gray  
 \* blue, powder  
 centroid color 191  
 \* gray, aqua  
 \* gray, blue  
 \* gray, bluish  
 \* gray, light Payne's  
 light Payne's gray  
 \* Payne's gray, light  
 pewter (color)  
 powder blue  
 slate (color)

\* Line of little value to the thesaurus user

Figure 9. Sample entries from alphabetical display

FL1	<styles and periods by general era>
FL2	<b>ancient</b>
FL3	<b>Dark Ages</b>
FL4	<b>prehistoric</b>
FL5	<b>protohistoric</b>
FL6	<three-age system>
FL7	<b>Stone Age</b>
FL8	<b>Paleolithic</b>
FL13	<b>Mesolithic</b>
FL14	<b>Neolithic</b>
FL33	<styles and periods by region>
FL34	<b>African</b>
FL35	<prehistoric African periods>
FL36	<prehistoric North African periods>
FL37	<African Paleolithic periods>
FL40	<African Epipaleolithic periods>
FL45	<prehistoric Sub-Saharan African periods>
FL46	<Earlier Stone Age>
FL51	<First Intermediate Stone Age>
FL54	<Middle Stone Age>
FL58	<Second Intermediate Stone age>
FL61	<Later Stone age>
FL66	<prehistoric African rock art periods>
FL74	<ancient African styles and periods>
FL75	<ancient West African styles and periods>
FL76	<b>Dawu</b>
FL77	<b>Ghana Kingdom</b>
FL78	<b>Koumbi Saleh</b>
FL79	<b>Gonja</b>
FL121	<ancient Central African styles and periods>
FL127	<ancient Southern African styles and periods>
FL143	<ancient Southern African pottery styles>
FL147	<ancient East African styles and periods>
FL166	<ancient North African styles and periods>
FL170	<Colonial African styles>
FL174	<African styles by region>
FL175	<West African styles>
FL176	<Northeastern Nigerian styles>
FL177	<Cameroon grasslands>
FL178	<b>Bamileke</b>

FL179	<b>Bagam</b>
FL2536	< <i>Early Western World</i> >
FL2537	< <i>ancient European styles and periods</i> >
FL2538	< <i>European Lower Paleolithic styles and periods</i> >
FL2544	< <i>European Middle Paleolithic styles and periods</i> >
FL2548	< <i>European Upper Paleolithic styles and periods</i> >
FL2563	< <i>European Mesolithic styles and periods</i> >
FL2574	< <i>European Neolithic styles and periods</i> >
FL2590	< <i>European Neolithic pottery styles</i> >

Figure %g. **Illustrative excerpts from FL Styles and Periods**