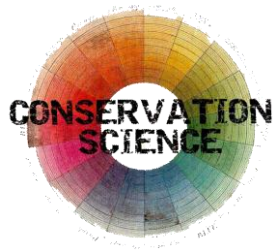


REPORT

Survey Methodology: Survey of Conservation Literature 1992-2012

ICCROM FORUM 2013 on
Conservation Science





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CONTENTS

Scope and objectives.....4

Methodology.....6

Appendix 1.....10

Appendix 2: glossary of terms.....13

CONTENT

Scope and objectives

This survey aimed to trace the main trends in the published heritage conservation literature over the past 20 years, and to highlight the dissemination pathways for conservation science findings. The survey focused on 15 well established conservation publications in four different languages, which together comprise a representative corpus of conservation research literature. These included: 2 periodicals and 2 conference proceedings in English, 4 periodicals in French, 3 periodicals in German, 1 periodical in English/German, and 3 periodicals in Spanish. The English publications were selected on the basis of their international readership, and were studied over a 20 year time span (1992-2012); all others were studied over a 5 year time span (2008-2012). In total 3367 conservation articles were analyzed and categorized (Table 1).

Source Publications	No. of records
English literature (1992-2012)	
ICOM-CC Congress Postprints (ICOM-CC)	1079
Studies in Conservation (SIC)	490
IIC Congress Postprints (IIC)	475
Journal of the American Institute for Conservation (JAIC)	352
<i>SUBTOTAL English</i>	2396
French literature (2008-2012)	
Technè, la science au service de l'histoire de l'art et des civilisations	133
Conservation exposition, restauration d'object d'art (CeROArt)	62
Coré: Conservation et Restauration du patrimoine culturel	54
Conservation-restauration des Biens culturels (CRBC)	27
<i>SUBTOTAL French</i>	276
German literature (2008-2012)	

Restoration of Buildings and Monuments : an international journal (RBM)	170
Restauero: Zeitschrift für Kunsttechniken, restaurierung und Museumsfragen	170
Beiträge zur Erhaltung von Kunst- und Kulturgut (BEKK)	94
Zeitschrift für Kunsttechnologie und Konservierung (ZKK)	71
<i>SUBTOTAL German</i>	505
Spanish literature (2008-2012)	
PH: boletín del Instituto Andaluz del Patrimonio Histórico (PH)	97
Ge-conservation	50
Conserva Revista del Instituto de Conservación y Restauración	37
<i>SUBTOTAL Spanish</i>	184
GRAND TOTAL	3367

Table 1. The publication sources selected for the conservation literature survey

Key questions

The survey sought to gather data on the trends and dissemination pathways within the conservation literature, in relation to the following key questions:

Author profile and distribution

1. What is the output of individual countries (numbers of articles)?
2. What types of institutions contribute to the literature, and in what proportion (numbers of articles)?
3. How is the regional diversity changing over time?
4. How is the institutional diversity changing over time?

Heritage type

5. What types of cultural heritage receive attention in the literature, and in what proportion (numbers of articles)?
6. Is there a shift in proportion of articles based on particular heritage types over the years?

Study focus

7. What types of study (e.g. study of materials and techniques, treatment) receive attention in the literature and in what proportion (numbers of articles)?
8. How does the distribution of study types change over time?
9. To what extent is the type of study influenced by the cultural heritage type; author geographic location and institution type; or language group?

Methodology

The survey was undertaken in 3 main phases: data collection (search and gathering of literature records); Record classification (automatic and manual categorisation of literature records); Data visualisation & analysis (import of records metadata to Excel & Tableau Public).



1. Data collection

Records were searched and collected using the following indexing databases and search engines:

- AATA (open access; conservation) <http://aata.getty.edu/Home>
- Web of Science (subscription; general science) <http://wokinfo.com/>

- Scopus (subscription; general science) <http://www.scopus.com/home.url>
- JSTOR (open access; general science/humanities) <http://www.jstor.org/>
- ICCROM library (open access; conservation) <http://biblio.iccrom.org/>
- Google scholar (open access; general) <http://scholar.google.com/>

The full citation (metadata) of each record was then imported to a reference management software¹. For further details regarding the import/export process, please see appendix 2.

2. Data classification

Indexed records contained certain data entries, depending on the index database from which the records were downloaded. In general, this information is automatically recognized and categorized by the reference software; in most cases this includes author(s), title, source publication, year, volume, series, pages and abstract. For this particular survey, information listed below was also collected and classified when available (depending on the indexing resource used):

- institution address/contact details of principal or corresponding author
- institution address/contact details of other authors
- number of citations

Moreover, imported citation records were further reviewed (with reference to the content of the abstract and full text article) and manually categorized according to the following criteria:

- Language of the article
- Geographic location (i.e. country) of institution of the principal author (i.e. first author)
- Type of institution of the principal author
- Material type of cultural heritage dealt with by the article

¹ The reference (citation) management software used for data handling and classification was Citavi (*Citavi Team Version 3.4.0*), as it was found capable of exporting records reliably to .csv format (which can then be used in Excel). A freeware version of Citavi for files containing up to 100 references is also available (<http://citavi.com/>)

- Content focus of the article

Categories:

An overview of the data categories used for the classification of the literature records is given below (manually assigned categories are marked with an asterisk*):

Category	Subcategory values
Year	All years covered by the survey
Source Publication	All publications covered by the survey
Language	All languages identified in the survey
Country (i.e. country author 1)	All countries identified in the survey
*Type of Institution	<ul style="list-style-type: none"> – Foundations / not for profit (FND/NFP) – Libraries & Archives (L&A) – Museums (MUS) – Heritage Agencies (HA) – Research Agencies (RA) – Private/ commercial (PRIVATE/COMM) – Public administration (ADMIN) – Higher education (EDU)
*Heritage type (by material class)	<ul style="list-style-type: none"> – animal materials – ceramics, glass & enamel – intangible – metals – multiple materials – natural organics – non material – non-cellular organics materials – other plant materials

	<ul style="list-style-type: none"> – paints & paintings – paper, photographic & audiovisuals & electronics – stone, wall painting & building materials – synthetic organics – textiles, fabrics & dyes – wood
*Content focus	<ul style="list-style-type: none"> – deterioration – education & training – history policy ethics legislation terminology – investigation tools & methods – management – materials & techniques – preventive – treatment – other

Please see Appendix 2 for a glossary of the category terms used

3. Data visualisation and analysis

The output of the data collection and classification comprised a data set containing 7 categories with varying subcategories (as presented above). To facilitate exploration and visualization of the data, the data set was imported to Tableau Public², a free data-tool software, which provides an advanced user-friendly interface, which allows users to transform data into insights. Using tableau public, we were able not only to present data via appealing graphs, but also to create an interactive, self-service, data-product tool for users to discover information and tailor their search based on their particular interests.

² To learn more about Tableau Public, see <https://public.tableau.com/s/>

Appendix 1

How to export data from indexing databases to Citavi & Excel

Indexing databases export in a wide variety of file formats, not all of which are compatible with Excel. However most are recognized by reference management software (such as Citavi) which will handle a wide variety of different file formats. Here are two examples (AATA and Web of Science):

AATA

AATA does not export in a format that is convenient to use in Excel. Therefore we used Citavi to open exported records from AATA. This was done as follows:

On completion of a search, select desired records by clicking on *Select all* or *Select the page*, or by clicking on individual records of interest.

1. click on *Export*.
2. In the popup window save the file in *.RIS* format.
3. open Citavi.
4. Go to *file*, and click on *Import*.
5. In the import window select *Text files (Ris, Bib Tex, ...)* and then click *Next*.
6. Select *RIS* and then click *Next*.
7. Select *Import a text file*, select your file and click *Next*.
8. Select character encoding and click *Next*.
9. Select the desired order of First and Last name, and click *Next*.
10. The records appear in the import window. Select the desired records, and click on *Add to project*.

In the popup window click OK to include keywords. The records are now imported to Citavi.

Web of Science

1. Select the record(s) to include in the output:

- Selected Records - Select the check box of each record.
- All records on page - Select a value in the Show 10, 25, or 50 per page list.
- Records NN To NN - Select a range of records (for example, 25 to 100).

2. Select the data to include in each record:

- Authors, Title, Source / Abstract: Includes bibliographic fields and author abstract.
- Full Record: Includes all the data on the Full Record page.
- Full Record and Cited Reference: Includes all the data on the Full Record page and cited references.

3. Export

Web of Science can export records in a number of output formats:

- Refworks
- Endnote
- HTML
- Plain Text*. (.)
- Tab-delimited (Win)
- Tab-delimited (Mac)
- Tab-delimited (Win, UTF-8)
- Tab-delimited (Mac, UTF-8)
- BibTeX

*note Web of Science recommend that you do not use Notepad to open these files, because this tool does not properly format the field tags

We found exporting and saving as Tab-delimited (Win) the most straightforward. This can be opened either in Citavi, or in Excel.

Google scholar

It is not possible to automatically download multiple records from Google Scholar.

EXPORT to spreadsheet software [Excel]

The records can be exported from Citavi to Excel, using the *Table* button on the Citavi toolbar. The data automatically appears as *Table View* in a new window (figure 1).

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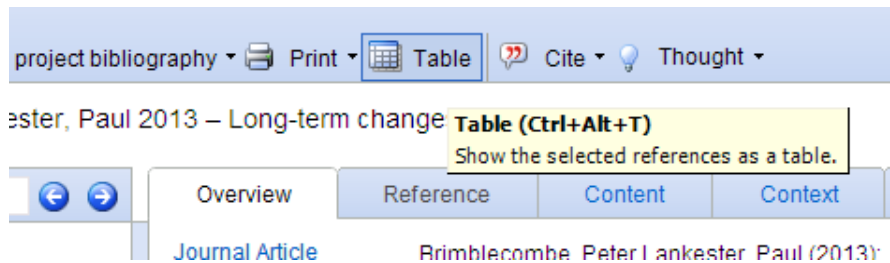


Fig 1. Export to Excel: Opening Table View in Citavi

It is then possible to select specific columns for export: click on the *Columns* button (1), select the columns in *All columns* and add to *Selected columns* (2). Choose the order of the information by displacing the columns with arrows (3). When finished, click *OK*. To export in Excel, click on the *Excel* button (4) (figure 2).

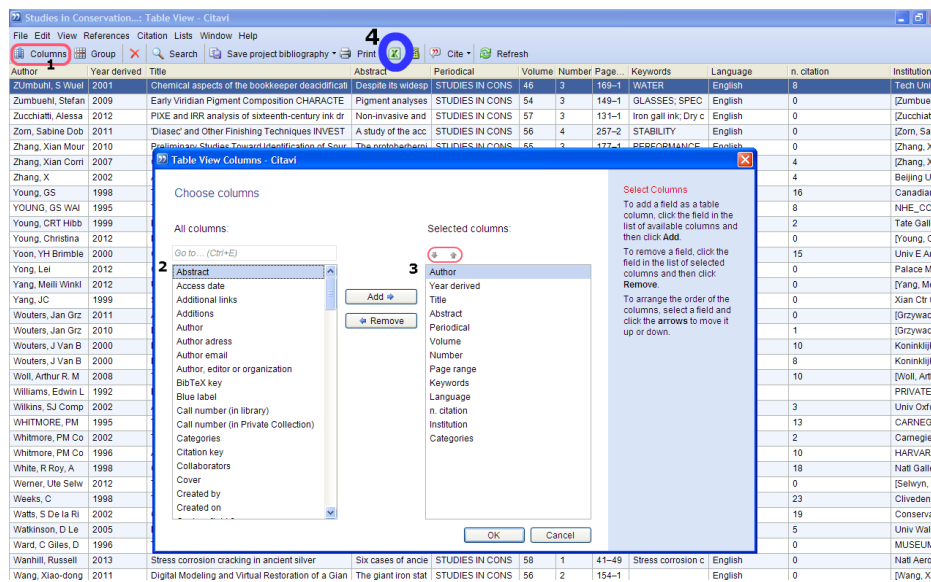


Fig 2. Export to Excel: Selecting columns for export in Citavi

Appendix 2: GLOSSARY OF TERMS

Heritage type

The following categories are by large based on the classifications developed by AATA (<http://aata.getty.edu/Home>). That list was further modified to include: *Wall painting and rock art*; *Intangible*; *Multiple materials*; *Non material*.

Paper	The records in this section pertain to paper and paper-based materials such as books, manuscripts, and archival documents. Literature concerning protein materials such as vellum, parchment, and bookbinding leathers is abstracted in this section where the subject matter is primarily of interest to paper or book conservators. Records that deal with leather, parchment, or vellum in a more general or anthropological sense are found in Animal materials.
Photographic	The records in this section refer to photographs—on paper, glass, metal, cloth, ceramic, or synthetic material substrates—positives as well as negatives including microforms (e.g. microfilm, microfiche, micro opaque). Records relating to computer output prints (e.g. inkjet prints, laser prints) or images resulting from reprographic processes (e.g. photocopying) are also covered in this section.
Paint and Paintings	The records in this section pertain to paintings and the polychrome layer on stone, wood, plaster, metal, and other substrates, as well as to paintings materials such as supports, binders and varnishes. Records that are concerned with color measurement and historical techniques are also included in this section. <i>Note: in AATA wall paintings are found in 2.1.3. Paintings, but also in 2.1.11 Stone & building materials. Therefore they have been removed from both of these categories and assigned a separate category 2.1.15 Wall Paintings and Rock Art (see below)</i>
Wood	The records in this section relate to objects or natural history specimens composed primarily of wood. This section therefore covers furniture, furnishings, wooden structures (particularly buildings and ships but also vehicles and aircraft), archaeological finds, musical instruments, etc. The term wood is used broadly for all lignocellulosic

	<p>species including the gymnosperms (softwoods) and dicotyledonous angiosperms (hardwoods), as well as monocotyledons such as bamboo, palm wood, cane, and rattan. Also covered are structural materials produced principally from wood, such as hardboard, fiberboard, plywood, and particleboard, chemically modified wood and wood composites.</p> <p>Literature covering root tissue is included here, but records on wood derived materials such as resins, dyes, leaves, bark (e.g., birch bark and cork), fibers, and fruits appear in the more appropriate sections (e.g., bark is found in Other plant material).</p>
Textiles	The records in this section relate to textiles and dyestuffs, fabrics, fibers, and dyes (e.g. carpets, tapestries, clothes, embroidered works of art, etc.).
Other plant materials	This section includes records on plant materials other than paper, wood, and textile fibers. Materials included here are bark and barkcloth, basketry and basketry fibers, botanical specimens, cork, gourds, grasses, leaves, matting, seeds, and any plant derived product or object made from them. Many objects dealt with in this section are ethnographic, but many will also be from decorative arts, costume, history, or natural history collections.
Animal materials	This section includes records on animal tissues, including antler, bone, feathers, fur, hair, ivory and ivory substitutes, leather, mother-of-pearl, mummies, shell, skin, teeth, zoological specimens, and any other cellular animal products. Pearls are included in <i>Stone and building materials</i> with gemstones. Parchment may be included here when it is the primary object of study or in <i>Paper</i> when it relates to an archival collection. Likewise, leather is included here except when it is considered as a bookbinding material. Many objects dealt with in this section are ethnographic, but many will also be from decorative arts, costume, history, or natural history collections.
Noncellular natural organics	This section contains records dealing with natural organic materials that are not cellular, e.g., recent and fossil resins, lacquer (urushi), pitch, tar, bitumens, waxes, fats, oils, gelatin, and collagen. Cellular

	materials of plant origin are covered in the sections on <i>Paper, Wood, Textiles and Other plant materials</i> , while those of animal origin are covered in the section on <i>Animal materials</i> . Note, however, that natural dyes of both plant and animal origin, although noncellular, are included in <i>Textiles</i> to which they are most commonly applied.
Metals	This section includes records on objects made of metal; it also covers metallurgical processes such as mining, smelting, refining, casting, forging, and minting, and associated tools and materials, such as smelters, slags, electrodes, crucibles, trip-hammers, and dies.
Ceramics glass enamel	This section includes records of ceramics, glass, or enamel. This section includes terracotta, tile, and fired brick, but cement, plasters, and adobe are found in <i>Stone and building materials</i> . Records relating to vitreous tesserae will be found in this section; stone tesserae are referred to in <i>Stone and building materials</i> .
Stone & building materials	The records in this section pertain to objects, at times including buildings, comprised partly or wholly of stone, stone-related materials such as mortars and plasters, and minerals. Records on gems and gemstones are included in this section. Literature on stone mosaics is abstracted in this section, whereas works on glass mosaics are found in <i>Ceramics, glass, and enamels</i> , as are works on all objects which require firing as part of their production, such as pottery, terracotta sculpture, fired brick, or other fired architectural elements. <i>Note: in AATA wall paintings are found in Paintings, but also in Stone & building materials. Therefore they have been removed from both of these categories and assigned a separate category Wall Paintings and Rock Art (see below)</i>
Synthetic organics	The records in this section pertain to the objects composed of synthetic organic materials or modified natural organic materials. Materials included are organic polymers such as plastics, resins, rubbers, and cellulose. Relevant polymer science—particularly that dealing with aging, the effects of colorants, or analysis—is abstracted here. Synthetic materials used in the production of photographic and

	audiovisual materials and textiles are found in photographs or textiles.
Electronic	The records in this section refer to electronic media such as magnetic tape (e.g., digital audio files), optical disks (e.g., CD-ROMs, photo CDs, DVDs, laserdiscs), and computer files (e.g., web sites, files on computer hard drives, CD-ROMs). The materials covered in this section are digital, i.e., binary encoded. The data may have originally been collected in an analog manner but was produced in digital format. The section includes electronic media regardless of the type of data retained (text, sound, picture, moving image) or method of binary encoding (manual, computer, laser, scanning).
Audiovisual	The records in this section refer to audiovisual materials such as motion picture film, videotapes (e.g., open reel or cassette), and audio recordings (e.g., open reel, cassette, disk, wax, or wire).
Wall painting and rock art	Records in this section relate to paintings in which the support is part of a contiguous structure—whether a free-standing building, ceiling or natural rock etc., and are typically named according to the support or surface onto which they are applied.
Intangible	<p>The 2003 UNESCO Convention on the Intangible defines intangible heritage as,</p> <p><i>“the practices, representations, expressions, knowledge, skills – as well as the instruments, objects, artefacts and cultural spaces associated therewith – that communities, groups and, in some cases, individuals recognize as part of their cultural heritage”.</i></p> <p>They are divided into the following domains:</p> <ul style="list-style-type: none"> (a) oral traditions and expressions, including language as a vehicle of the intangible cultural heritage; (b) performing arts; (c) social practices, rituals and festive events; (d) knowledge and practices concerning nature and the universe; (e) traditional craftsmanship.

Multiple materials	These records cover collections without a defined material class (for instance ensembles, historic interiors, ethnographic collections, industrial collections, scientific, natural or archaeological collections) and objects made of more than two types of materials (as classified here).
Non material	This section contains records that do not focus on materials. Consequently, the main content is concerned with other non material aspects such as collection management, theory and history of conservation, communication and related topics.

Study type (content)

Investigation tools & methods	The category is focused on tools and methods used to document and investigate cultural heritage objects. This section covers the application of non conventional analysis and techniques and also includes documentation tools and methods.
Materials & techniques	The topic is focused on the material composition or construction technology of the object. Records within this category include studies to characterize and identify the material composition, construction technique, object history, authenticity, provenance and dating studies.
Preventive	This category contains records regarding methodologies, tools and research for preventive conservation, collections care, and risk management.
Deterioration	This category focuses on records which study the causes and manifestations of deterioration, such as deterioration mechanisms (e.g. material aging processes) and their effects (e.g. deterioration phenomena and other effects).

Treatment	The treatment category includes studies and research on treatment strategy, materials and innovative application methods for conservation practice.
History policy ethics legislation terminology	Records in this section are concerned with aspects of conservation and preservation policy, standards & guidelines, including historical, ethical, and legal factors guiding conservation practice and planning such as legislation, public awareness, and advocacy.
Education & training	The records in this section pertain to institutions, curricula, methodology, and theory for the teaching of conservation and conservation-related subjects.
Management	Management records include not only practices regarding insurance, budgeting for preservation and economic impact, but also strategy e.g. to engage community and institutions advocacy.
Other	This section refers to records with diverse topics other than those listed above.