

The Cloister of St. Michael's Church, Hildesheim

- Conservation Reports Go Online

Cord Brune

Hornemann Institute, Center for the Preservation of Cultural Heritage, Hildesheim, GERMANY

ABSTRACT

An innovative online database and documentation software called *hericare* (heritage conservation and restoration experience) has recently been developed by the Hornemann Institute, Center for the Preservation of World Cultural Heritage. *hericare* offers easy worldwide access to practical and up-to-date information from all lines of specialisation in conservation-restoration. Recently, among others, a report on the examination and pilot conservation study of the cloister of St. Michael's church, listed as World Cultural Heritage, has been added. This demonstrates how information on preservation projects can be made accessible to all for the benefit of the cultural heritage as such.

Keywords: World Heritage, preservation, conservation report, documentation, database, software, internet, knowledge transfer

1. INTRODUCTION

In 1985, UNESCO added two Hildesheim monuments to the World Heritage List: The *Cathedral of Hildesheim and St Michael's Church*. Since March 1999, the cloister of St. Michael's has been covered by a provisional protective enclosure for the purpose of enabling the necessary climatic measurements and examinations by scientists and stone conservators. The work was sponsored by the Deutsche Bundesstiftung Umwelt (DBU, German Federal Environment Foundation). The results of the project, partly described in the following, were included in the *hericare*-database developed by the Hornemann Institute and described in the second part of the paper. For a temporarily free access to *hericare* please see below ("*3.4 Access to hericare*").

The Hornemann Institute was founded in 1998, following an international *symposium* in Hildesheim in 1997, during which the profile of the projected institute was put in concrete terms with the help of UNESCO's World Heritage Center. The non-profit institute focuses on the dissemination of knowledge through traditional and modern media, databases and e-learning modules.

2. THE CLOISTER

2.1 History

The Benedictine Monastery of St. Michael, founded by Bishop Bernward, belonged to the reformed monasteries of the "*Heiliges Römisches Reich*" (*Holy Roman Empire*). The first monks arrived around the year 1000 A. D. The monastery church, erected from approx. 1010 onward and consecrated in 1022, is one of the key

works of medieval architecture. It is a double-choir basilica with two transepts. The west choir is emphasized by an ambulatory and a crypt. The interior of the church is characterized by strict monumentality and sobriety. The rhythm of its nave arcades results from the so-called *niedersächsischer Stützenwechsel* ("Lower-Saxon alternation of supports": column - column - pillar), which became characteristic of the Romanesque period in the Duchy of Saxony.



Fig.1 Cloister of St.Michael's Church, west wing

In the 1170's, under Bishop Adelog, a new portal from the cloister to the northwest side wing was added. In 1186 the Bishop re-consecrated the church. Some parts had been damaged by a fire, so that a certain amount of repairs were necessary: the columns of the middle nave received new capitals with figured and floral motifs. The walls of the aisles were decorated with

stucco reliefs, among which the depictions of the Beatitudes in the south aisle have been preserved in part to this day. Then, around 1220/30, the western enclosure of the cloister was renovated and two portals with trefoil arches were inserted. Between c. 1230 and 1250 the cloister received a new arcade wall and vault, which took into consideration the different yoke depths on the portals, but intersected the 11th century niches, therefore these were bricked up. [Hammer et al. 2000a]

Towards the end of the 17th century the monastery complex underwent drastic remodelling. After the Benedictine monastery of St. Michael was dissolved in 1803, the buildings fell into disrepair, until 1827, when a hospice was moved into deserted rooms. This was closed in 1943 in order to set up an SS-Training facility called "Haus Germanien" or "Germania House", before the building fell victim to the extensive bombing of Hildesheim in 1945. Today, parts of the building in the west wing of the cloister, rebuilt in 1953, still contain historical rooms. [Keil 2000]

2.2 Polychromy

Plaster, distemper and polychrome painting, which are characteristic of the appearance of the cloister in the Middle Ages, have been lost, with the exception of a few traces. The most recent conservation-restoration examinations give the impression of different layers of architectural polychrome painting: in the early 11th century a fine, well-smoothed lime plaster was applied on the western wall with the niches.

The Adelog portal of the late 12th century consisted of red and light-beige sandstone. The alternating colours in the stone were taken up in the subsequent polychrome painting on the portal, using red, pink and ochre. The partly glaze-like application of the paint allowed the colours of the stone to show through. The two trefoil-arched portals have polychrome painting in grey and white or pink and white tones. The artistic details of this polychrome painting can no longer be reconstructed. The new layer of polychrome painting on the architectural surfaces, which the cloister received when it was remodelled with vaulting c. 1230-1250, can be said to have been applied on a layer of fine lime plaster. The contemporaneous polychrome painting on the architectural sculpture is almost completely lost. Only a small capital still shows remains of grey paint, which has been applied directly on to the stone surface. In later periods the cloister was also repeatedly renovated, as indicated by the numerous fragmentary remains. The interior and exterior of the cloister were continually maintained using lime-based techniques. [Schädler-Saub et al. 2000a]

2.3 Historic Restoration

The western wing of the cloister was restored by the architect and restorer Conrad Wilhelm Hase in the third quarter of the 19th century. At the same time, the arcade wall that was altered in the Post-Medieval period was extensively renovated. In other parts of

the building the historical construction materials were respected and preserved. Repairs and mortar replacements were carried out using cement-containing putty mixtures and coatings, which lead to an acceleration of the deterioration processes. Finally, a subtly differentiated stone-coloured paint layer was applied to the treated surfaces to even out variations in the colour of the repairs and the original material

2.4 Reconstruction

St. Michael's Church and the adjacent cloister were severely damaged in World War II and thereafter rebuilt with different priorities in the monument maintenance programs. While the church was reconstructed in its Ottonian form, destroyed parts of the monastery complex were replaced with new buildings. Parts of the western arm of the cloister surviving 1945 were left, and integrated into the reconstructed buildings in 1952. [Wehner 2000]



Fig.2 Cloister of St.Michael's Church, vault springer, showing stone deterioration

2.5 State of Preservation and Measures

2.5.1 Deterioration and Damage Factors

The cloister is in an endangered condition: the surface of the Rhaet Sandstone, of which most of the remaining medieval architectural sculpture is made, is to a great extent pulverised.

The replacements on the east wall carried out under C.W. Hase already show significant deterioration. The surface is unevenly covered with a black gypsum-containing crust and in some areas a thin cement-wash. The examination results indicate that the main cause of the damage is not the rising ground moisture, but rather the hygroscopic effect of the existing accumulation of salts, triggered by fluctuations in the climate and the associated processes (condensation, transport of salts and weathering due to salts, through cyclic alternation of humidity and dryness).

To a considerable extent, the deterioration is also due to the use of damaging materials in the restoration work carried out under Hase, as well as to the direct weathering of the vaults following the bombing on 22nd March 1945, which dramatically accelerated the normal weathering process. During the last 10 years, comparatively little dramatic damage seems to have occurred. [Hammer et al. 2000b]

2.5.2 Preservation Measures

Objectives:

To begin with, conservation-restoration of the historical substance is required, including that which is characteristic of the present appearance of the architectural structures, namely the polychrome painting applied during the 19th century restoration. The pilot study in yoke 7 represents the first part of the conservation work in the cloister. The techniques and the aesthetics of this conservation work as well as the maintenance objectives for this monument were developed in detail in the study. The climate fluctuations must be reduced as far as possible. The precondition for a lasting preservation perspective is the construction of a permanent protective shelter.

Pilot Measures taken:

- a) Treatment of the damage phenomena: structural consolidation of the stone and of the sanding mortars, filling and stabilisation of flakes, cleansing of the surface by way of removing or thinning the dark incrustation layer.
- b) Measures against the causes of damage: Reduction of the soluble salts concentrated on the stone surface. For all conservation measures, mineral materials were used only.
- c) Conservation of the original surface: Application of a lime wash, continuation of the historic tradition of painting and repairing the architectural surface, as ascertained by the investigations. [Hammer et al. 2000c]

2.6 Conservation Report

Apart from several articles for the book accompanying the exhibition "The cloister of St. Michael's Church in Hildesheim. 1000 years of cultural history in stone", a general conservation report has been written. The report was addressed to the "Deutsche Bundesstiftung Umwelt (DBU, German Federal Environment Foundation)", which had sponsored the pilot study. Due to the DBU's partnership with the Hornemann Institute, this report has recently been included in the *hericare*-database. It can be viewed in the database, the name is "*Kreuzgang, ehem. Michaeliskloster*" at "*Hildesheim*", Author: "*Hans-Jürgen Schwarz*". For further information on the temporarily free access for UNESCO Virtual Congress participants, please see below ("*3.3 Access to hericare*")

3. HERICARE

3.1 Idea and concept

The acronym *hericare* stands for Heritage Conservation and Restoration Experience. *hericare* consists of two components, an online database called "*hericare-database*" and a documentation software called "*hericare-docu*".

In accordance with the aims of its developer, the Hornemann Institute, the purpose of *hericare* is to support the international exchange of information between experts. Information gained working on an object, concerning conservation materials, methods of treatment, results of examinations and research, could be very valuable for other experts, if it is available without loss of sometimes immensely important details by summarising or editing it for publication.

The idea was derived from MONUFAKT, a database containing conservation reports, but only on monuments damaged by immissions. MONUFAKT, set up in 1987 and formerly run by the German Umweltbundesamt, Berlin, was intended to make the reports searchable and to interrelate the information. Input, retrieval and output of information was done by the staff at the Umweltbundesamt.

The Hornemann Institute inherited the 250 conservation reports and extended the concept:

- To reach a larger audience and to fasten the information retrieval, the database was designed as an online database, being accessible all over the world at relative low costs.
- To include all lines of specialisation in cultural heritage conservation (overlapping so much and offering a lot of information for other specialists), the structure of the documentation scheme was simplified
- To facilitate the documentation of preservation projects the documentation software *hericare-docu* was developed. Thus to assist and encourage the user in documentation and to easily introduce the resulting reports to *hericare-database* only by a few clicks.
- To keep information up to date, the *Forum* gives users of the database the opportunity to make comments and/or suggestions to every report (the *Forum* is accessible with the report and can be searched too).
- To facilitate the use of the software and the access to the database, every action is described in the help files. All buttons are linked to the Context Sensitive Help. Additionally several master reports and a user manual for download are available.

The documentation records created by means of *hericare-docu* will be taken over unabridged from their respective authors, conveying their expertise and useful details without any alterations. The required minimum of information is indicated above the input fields in *hericare-docu*. Furthermore, the *Forum* permits the exchange of information, ideas and comments on the described techniques and products between colleagues even if a user has not handed in a complete report of his own .

The concept for *hericare* was developed in the Hornemann Institute between 1999 and 2001. During the developmental

phase, experts working in the fields of conservation (of monuments and sites, as well as in museums), database development, software ergonomics and library systems supported the institute. Hericare is accessible since February 2002.

3.2 hericare-docu - documentation software

With the help of the documentation program *hericare-docu*, conservators, restorers, architects and other specialists in the field can easily create documentation records of their current preservation projects in their workshop or in situ. Particular emphasis has been put on intelligibility and user-friendliness in order to assist users from any cultural background. Therefore a layout was chosen that has the most resemblance to the wellknown Microsoft products.

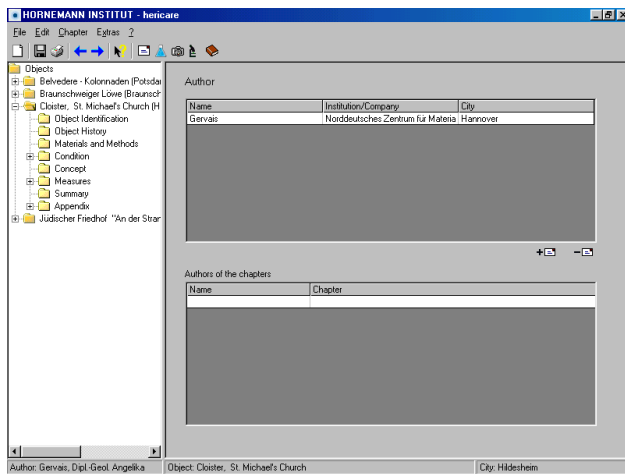


Fig. 3 hericare-docu user interface, first page, showing tree structure of objects (left side) and user input fields (right side: list of authors)

Navigation on the level of the chapters is possible by means of the tree of folders or by the blue arrows in the icon bar (Fig. 3, 5). Within the chapters there are up to 4 tabs to click at. The number of tabs depends on the amount of input fields that are necessary to that chapter (Fig. 4).

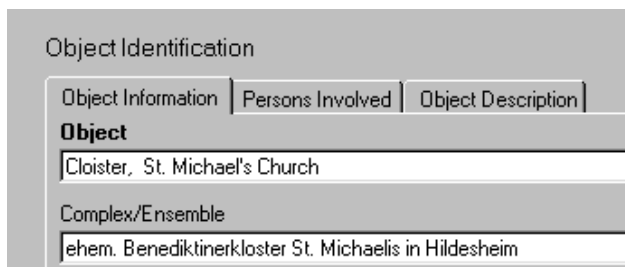


Fig. 4 hericare-docu, Object Identification chapter, showing tabs.

3.2.1 Structure

The structure of the documentation program stays on a general level, so as to guarantee that all areas of specialisation can be covered. In accordance with the standard structure of documentation records, each report is divided into the chapters Object Identification, Object History, Materials and Methods, Condition, Treatment Plan and Measures.

The chapters Condition can be subdivided into folders describing specific damages or actions taken if this should be required due to the amount of the available information. Each new Condition and Measures folder contains the the same inputfields on its 3 tabs. The chapter Measures can be as well subdivided according to the amount of information.

The Appendix lists all figures, examinations and literature cited in the input fields of the document. A summary of each documentation record adds to clarity when published online in *hericare-database*.

To report on extensive projects or large objects, several "parts of an object" (subfolders) with the same internal structure as discribed above can be created. (Fig. 5, *Sandsteinsäulen ...*)

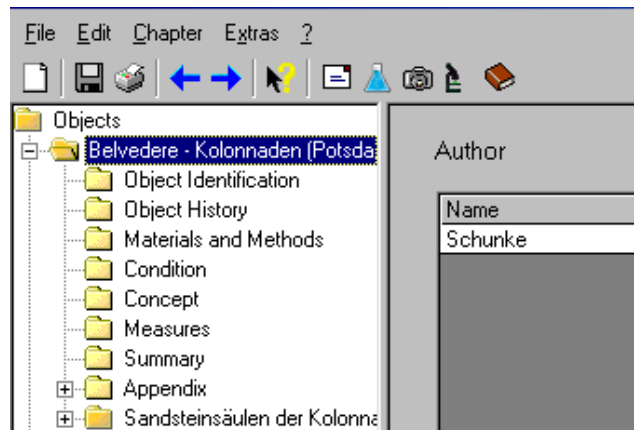


Fig. 5 hericare-docu user interface, first page: Icon bar (on top) and opened object with part of an object (left side, showing the chapters)

Hericare-docu offers therewith a scheme to follow during documentation work. It will not fit for every purpose and there might be some specialists that miss a field. But the general structure allows to introduce every information.

3.2.2 Working with the software

In order to enhance the usability of the software, the programme has among others the following features:

- Input fields of different size: single row fields for one term or fields up to 60000 letters were necessary.
- Listing fields: for adding authors (Fig. 3, 5), products and so on.
- Internal databases for citing addresses, products, images, description of examinations and literature assist the user (see icons at Fig. 5).

- Fields with drop-down menus: to choose from a list of terms. The menus can be edited by the author. In future special drop-down-lists will be available for the different lines of specialisation using different terms.
- Users can copy text blocks from existing text files and paste them into the input fields. It is also possible to attach complete files to some of the fields.
- Import and Export functions enable the transfer of data between several, locally separate participants in one project.
- Complete reports or parts thereof can be converted into RTF files, allowing the user to edit them in his own text-processing program. The records can thus be adapted to a corporate design or to any form of layout which customers or clients may use.

hericare-docu is available as a single user and as a network version with unlimited number of users. The latter enables institutions and companies with several workstations to use the internal database, for example the addresses database, commonly and reducing the amount of double input.

The specialists can not only use *hericare-docu* for publishing their work in *hericare-database*, but also as a tool for every day documentation. In such case the scheme can be filled out partly only with the information favoured. To find objects the list of objects displayed in the file tree can be sorted alphabetically by the name of the object or by the name of the city.

When a report is completed and wished to be published, it can easily be exported from the software and send to the Hornemann Institute by email or by postage. The institute will check if all required fields (with bold titles) are filled out and load the report to the database by a click. Reports will not be reviewed, but incomplete reports will be send back to the author to be completed.

3.3 *hericare-database*

hericare-database contains the documentation records created by means of the *hericare-docu* software. These can be retrieved throughout the world via Internet. Any registered user can view the reports in the database and exchange technical experience with their authors.

3.3.1 Information Retrieval

There is a variety of options to search the inventory of records, thereby making detailed information about the condition of objects, applied measures and products and experts involved in conservation-restoration available. By combining terms in the Advanced search new aspects of information can be generated out of the data.

The query options consist of

- a) the 'Standard Search': a single input field combinable with the chapters of the reports,
- b) the 'Advanced Search': four input fields each combinable with a section of the report to be chosen,
- c) refining a search by searching the result (whole reports) again,

- d) the 'Search History', that lists all previous searches of the session,
- e) searching a period or a dating by entering special operators

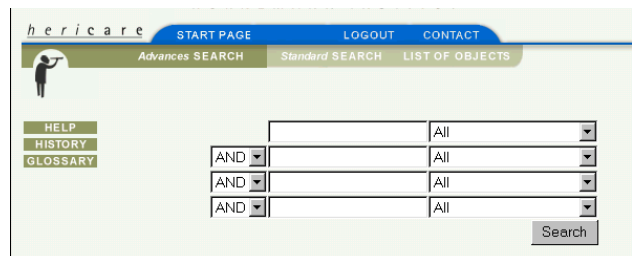


Fig 6 *hericare-database: Advanced Search features*

Moreover, all reports in the database can be sorted by name, city or date.

3.3.2 Display of information

A search result lists the reports with the chapters were the searched term(s) are found. By clicking the chapter of the report is opened and the term(s) are highlighted.

The reports are displayed in the database as the following figure illustrates:

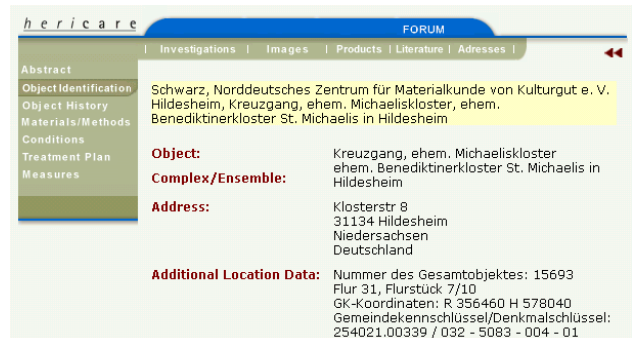


Fig 7 *hericare-database: Object identification, cloister conservation report*

For viewing the database please see "3.4 Access to hericare" for a link and the access data.

3.3.3 Contents of the Database

hericare-database contains around 300 conservation reports on monuments and objects. Among these all conservation projects which have been sponsored by the Deutsche Bundesstiftung Umwelt (German Federal Environment Foundation) in the past, and which have, until recently, been managed by the Umweltbundesamt (Federal Environment Agency), under the name of MONUFAKT. Currently, most datasets are in German. So far, subject matters tend to focus on the conservation of stone, wall paintings, glass and metal. More english reports will follow from

the already existing co-operation with some polish universities teaching conservation. The Hornemann Institute seeks to find more co-operating partners from all countries.

3.4 Access to *hericare*

3.4.1 *hericare-docu*

The *hericare-docu* software, is available on CD-ROM or for download on Internet, both for the single user and the network version. While the software has been designed for Windows® platforms, the online version is independent from the type of operating system used. It is accessible by internet at the *hericare* homepage. A 30-day trial is free of charge (please see www.hericare.com/english/screenshot.htm).

Contributing authors will be granted free access to the online *hericare*-database. For further information and fees, please visit the *hericare* homepage (see below).

3.4.2 Access to *hericare*-database

Access to *hericare*-database is temporarily free of charge for the participants of the UNESCO Virtual Congress. The address is www.hericare.com. The necessary user name is **UNESCO-Congress**, the password is **U2fax**.

Furthermore, free access will be granted contributing authors and to all co-operating partners, already several conservation universities. For further information, please visit the *hericare* homepage.

4. CONCLUSIONS

Since the Hornemann Institute wishes to contribute to the global transfer of knowledge, the inventory of reports in *hericare* is projected to increase through partnerships with other institutions, such as museums, conservation offices, universities and schools. The structure and the programming of *hericare* have been custom-tailored to permit extensive co-operation between different entities in the field of cultural heritage.

This paper may help to establish such partnerships to the better understanding and preservation of the world's heritage.

hericare intends to complement with its concept the existing databases on conservation literature and the conservation reports and research published on some institutions website. Examples are the *Bibliographic Database of the Conservation Information Network* [BCIN 2002] and the *Art and Archaeology Technical Abstracts* [AATA 2002] as well as the *Conservation Information* database run by the Canadian Conservation Institute [CCI 2002] or the *Getty Conservation Center PDF Publications* [Getty 2002]

Currently, the documentation software and the database are available in English and in German. A French version is being developed. Depending on the funding a spanish version is also intended to be realised sooner or later.

5. ACKNOWLEDGMENTS

The description of the cloister and its examination and conservation is cited from articles from several authors, that were compiled by the Hornemann Institute for a Catalog accompanying an exhibition about the construction and the restoration of the

cloister for EXPO 2000. The articles and the conservation report incorporated in *hericare*-database are based on the results of the work of the University of Applied Sciences Hildesheim/Holzminden/Göttingen, the State Conservation Office in Lower Saxony (*Niedersächsisches Landesamt für Denkmalpflege*), the Center for Science of Materials used in Cultural Properties, Northern Germany, e.V. (*Norddeutsches Zentrum für Materialkunde*) as well as on the work of free-lance conservators/restorers. The conservation work was taking place on behalf of and under the direction of the *Evangelische Landeskirche*. It is being sponsored by the *Deutsche Bundesstiftung Umwelt*. Director of the conservation/restoration work: Prof. Dr. Ivo Hammer, University of Applied Sciences Hildesheim/ Holzminden/ Goettingen. Author of the conservation report: Dr. Hans-Jürgen Schwarz

REFERENCES

- HAMMER, I., SCHÄDLER-SAUB, U., HENTSCHEL, B., KESSLER, T. AND LUTZ, G. 2000a. Medieval Construction History. In *Der Kreuzgang von St. Michael in Hildesheim – 1000 Jahre Kulturgeschichte in Stein*. Seegers-Glocke, C. and Weyer, A. (Ed.) Hameln: Niemeyer, 56-61.
- HAMMER, I., ASSMANN, C. AND MANIUSCH, N. 2000b. State of Preservation and Damage from a Conservation/Restoration Point of View. In *Der Kreuzgang von St. Michael in Hildesheim – 1000 Jahre Kulturgeschichte in Stein*. Seegers-Glocke, C. and Weyer, A. (Ed.). Hameln: Niemeyer, 138-149.
- HAMMER, I., RECKER, B. SCHUBERT, J., CHIONYE-EJIM, C. SCHMITT, C., EIFINGER, M. AND HOFFMANN, L. 2000c. Potential and Prospects of Conservation. In *Der Kreuzgang von St. Michael in Hildesheim – 1000 Jahre Kulturgeschichte in Stein*. Seegers-Glocke, C. and Weyer, A. (Ed.). Hameln: Niemeyer, 160-167.
- KEIL, V. 2000. The Monastery Buildings Following Secularisation. In *Der Kreuzgang von St. Michael in Hildesheim – 1000 Jahre Kulturgeschichte in Stein*. Seegers-Glocke, C. and Weyer, A. (Ed.) Hameln: Niemeyer, 38-42.
- SCHÄDLER-SAUB, U., HAMMER, I., FUHRMANN, M., HANSCH, J., HENTSCHEL, B. AND PRATESI, I. 2000a. Polychromy of Medieval Architectural Surfaces and Architectural Sculpture. In *Der Kreuzgang von St. Michael in Hildesheim – 1000 Jahre Kulturgeschichte in Stein*. Seegers-Glocke, C. and Weyer, A. (Ed.) Hameln: Niemeyer, 71-90.
- SCHÄDLER-SAUB, U., ASSMANN, C., EGER, F., PRATESI, I. AND SPIES, R. 2000b. Conrad Wilhelm Hase and Conservation-Restoration of the Wing of St. Michael in the Third Quarter of the 19th Century. In *Der Kreuzgang von St. Michael in Hildesheim – 1000 Jahre Kulturgeschichte in Stein*. Seegers-Glocke, C. and Weyer, A. (Ed.) Hameln: Niemeyer, 94-104.
- WEHNER, H. 2000. Destruction and Reconstruction After 1945. In *Der Kreuzgang von St. Michael in Hildesheim – 1000 Jahre Kulturgeschichte in Stein*. Seegers-Glocke, C. and Weyer, A. (Ed.) Hameln: Niemeyer, 105-111.

AATA 2002. *Art and Archaeology Technical Abstracts*
<http://www.getty.edu/conservation/resources/aata.html>

BCIN 2002. *Bibliographic Database of the Conservation Information Network*
<http://www.bcin.ca>

CCI (CANADIAN CONSERVATION INSTITUTE) 2002. *Conservation Information database*
http://www.cci-icc.gc.ca/document-manager/conservation-information_e.cfm

GETTY 2002. *Getty Conservation Center PDF Publications*
<http://www.getty.edu/conservation/resources/>

HERICARE. 2002. *Online database and documentation software.*
<http://www.hericare.de>

HORNEMANN INSTITUTE. 2002. *Website of the Center for the Preservation of World Cultural Heritage*
<http://www.hornemann-institut.de>

ABOUT THE AUTHOR

Cord Brune is Project Manager at the Hornemann Institute, Center for the Preservation of the World Cultural Heritage. He holds a degree in Conservation and Restoration of Cultural Heritage from the University of Applied Sciences Cologne. Contact information: *HORNEMANN INSTITUT, Kardinal-Bertram-Strasse 36, 31134 Hildesheim, Germany* Email: brune@hornemann-institut.de



Fig 8. *St. Michael's Church, Hildesheim, Germany: total view from southeast*