The cemetery of St. Peter's church Berlin/Cölln 1200-1717

database project

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Berlin originally developed from two adjacent medieval towns on either side of the river Spree; one was named '*Berlin*' and the other '*Cölln*'. The phenomenon of the *Doppelstadt* (double-town foundation) appeared during the German eastward expansion of the medieval period. The name '*Cölln*' is derived from the Latin word *colonia*. Naming one of the towns of a double-foundation '*colonia*' is not unique, since the counterpart of medieval *Meißen* was also known as *Colonia*, which developed into the modern place name, *Cölln*. [1]
A large open area excavation took place between 2007 and 2009, in the heart of Berlin's *Cölln*. Within the site's limits were the foundations of the town's main church (*St. Petri*), an adjacent Latin school and houses in the area of *Cölln*'s town hall. Surrounding the church was a cemetery, densely packed with graves, which was closed in 1717 on sanitary grounds - many inner-city cemeteries were shut during this period on the same grounds. In total, 3,126 graves were documented in the cemetery of the church of *St*. *Petri* (St. Peter's). They contained at least 3,717 individuals since many mass graves were discovered, containing between two and eleven skeletons.[2]
All of the structural remains were documented with a 3D laser scanner,[3] as were many of the negative contexts from the medieval settlement, such as cellars cut into the underlying soil. Laser scanning is particularly suitable for recording such three-dimensional, negative features that are revealed by the sort of stratigraphic excavation methods employed on the St. Peter's site (*Petriplatz*).[4]
An internet-capable, user-friendly database was developed for the excavation at Petriplatz to assist in the compilation and management of the high quantity of data it produced (NADA 1.2.5.4 ©A. Teper, PhD J. Sewell, C. M. Melisch 2013). Information from the context sheets was linked directly with relevant photos and with information on bulk finds and special finds, using the context number as the primary key. It was not necessary to rename the photos for their use by the database. The photo's file names were linked to context

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[1] Pohl, H.-J. (2008): Cölln bei Meißen. Die Gründungsgeschichte eines Meißner Ortsteiles - Beispiel einer fehlgeschlagenen Stadtplanung?

[2] Melisch, C. M. / Sewell, J. (2011): Historische Chance – eine umfangreiche, mittelalterliche bis neuzeitliche Skelettserie vom ehemaligen St. Petri-Kirchhof in Berlin-Mitte. In: Mitt. BGAEU 32, 2011, 107-120.

[3] Melisch, C. M. (2011): Die Wiedergewinnung des mittelalterlichen Cölln am Petriplatz. Moderne Dokumentations- und Visualisierungsverfahren in der archäologischen Praxis, in: Acta Praehistorica et Archaeologica 43, 2011, 81–94.

[4] Melisch, C. M. (2009): Moderne Grabungsmethoden für die Erforschung und museale Präsentation am Beispiel der Ausgrabungen auf dem Petrikirchplatz Berlin. In: Archäolog. Nachrichtenblatt Bd.14, 4/2009, 319–322.

numbers on a regularly maintained Excel worksheet which was uploaded into the database; Exif-data from the photo files can be displayed in the database.

A graphically interactive, Harris Matrix module was programmed for the database by A. Teper, to which all the information from individual contexts (description, finds, samples, photos) is directly linked. Limitations in the graphic representation have been the traditional problem for Harris Matrix software. In some Harris Matrix software, the form or colour of context number-representations can reflect the type of context, but there is considerably more potential in the way matrix software can work for the archaeologist. Since a Harris Matrix assists in the interpretation of the relative chronology of a site's stratigraphic units, for example, it is possible to display for example a miniature photograph of the context or the currently applied date within the relative-chronological sequence.

With the access to all the information linked to a context number, the interactive format of the Harris Matrix module opens up a complete new spectrum of possibilities in post-excavation analysis. Already, the module is able to assist in the absolute dating of contexts, even those which did not contain any finds. This is achieved through the exploitation of the database's module for bulk and special finds, and the module for (dateable) samples which contain fields into which a date-range can be generated or entered manually against each entry. The full range of dates assigned to finds from an individual context produces an overall date range for that context. By linking these context-specific date-ranges directly to the individual stratigraphic units in the matrix, it provides a basis for automatically generating a date-range for otherwise undated contexts located between dated contexts up and down the matrix's vertical sequence. Effectively, the manual input of the stratigraphic sequence and of the dates of finds and samples, automatically assigns an absolute chronology to the Harris Matrix (which can be manually refined by the user within the database). Similarly, potential discrepancies between the relative and absolute chronologies of contexts are automatically highlighted in the process, revealing errors made during excavation, documentation or database entry, which would otherwise be labour intensive to pick up on.

Due to the particularly high number of graves in the cemetery, their chronological analysis presented a complex problem. Not many of the graves contained grave goods, and much of the ceramic within the grave fills was ultimately derived from the underlying remains of settlement into which many of the graves were cut (resulting from an expansion of the cemetery during the medieval period at the cost of neighbouring properties). Dating the graves on the basis of ceramic was thus problematic or impossible. However, the database generated a provisional date-range for each of the undated graves, based on the more securely dated examples located above and below them in the stratigraphic sequence. This was enormously useful for phasing the varying intensity of the cemetery's use over time. The results also assisted in the selection of candidates for C14 dating samples.

So the database, originally created with a view to assist in the management of data, has become a tool for its analysis, one with huge potential for further development. During the process of developing it, we have learnt much about our own requirements, as archaeologists, from such a database. We discovered, for example, that there was a distinction in the role that the database played during the excavation and during the post-excavation analysis. Inputting data regularly during the course of the excavation provided a means by which data integrity and lacunae could be checked, at a moment where discussion with the excavators was still possible about events still fresh in the memory.

This function was still useful during the post-excavation inputting of finds data, but once the stage of report writing and preparation for the publication had been reached, the focus shifted to the ability to analyse the data. We wanted to know, for example, how many spindle whorls had been found, or the overall quantity of window glass. By this stage, we could rely on the information contained in the database. More time could be spent by our team on research during the limited time allotted for the post-excavation analysis which, traditionally in Germany, usually involves the writing of lists and the renaming of photographs.

As well as all the context data, photos and descriptions, information on all the finds was also entered into the database. In total, 224,684 items under the grouping 'bulk finds' were recorded, and 4,348 'special finds'. The bulk finds have corresponding database-entries for category, quantity and date. Each special find possesses a photo, a description, geospatial data and is dated. The better preserved special finds (2,142 objects) have been added to the collection of Berlin's *Museum für Vor- und Frühgeschichte* (Museum for Prehistory and Early History). The museum's study collection was established in the nineteenth century. Its reference system is geographically based, and each of our finds was given a catalogue number which contains this information. This catalogue number, which has to be referenced in publications, indicates with a Roman numeral the specific excavation where the item was found; the letter 'f' denotes the find-spot within the *Mark Brandenburg* and the unique key is provided with a five figure number. Thus an inventory number of a special find from the *Petriplatz* excavation would appear, for example, as 'If 24796/0001' in the museum catalogue. This number neither conveys the context and special find numbers assigned during the excavation, nor the official site-code provided by the local government authorities responsible for the excavation. As a consequence, a visiting researcher to the museum would have difficulty in relating the museum's inventory number for an artefact with the context/finds number assigned it during the excavation. It has been possible to overcome this problem with the help of the database, which can generate a new inventory number and link it with the reference system of the excavation. Thereby it becomes possible to use the museum's inventory number as a search term, and instantly find, for example, the position of a artefact in the stratigraphic sequence or its actual find-spot. Naturally, the museum's reference system was not designed with our bespoke database in mind. In fact, the museum which, like many other state museums, belongs to the *Stiftung Preußischer Kulturbesitz* (Prussian Cultural Heritage Foundation), has its own computer database, *Museum Plus*. The purpose of *Museum Plus* is to bring together all the Foundation's collections in one application, and to make a selection of them available online.

Our database has been developed primarily to help the archaeologist, on the one hand to catalogue and check data during the excavation and, on the other hand, to provide a post-excavation tool, permitting the ordering and filtering of data. Additionally, it has been necessary to integrate information on where the archaeological material is stored at any given time during the post-excavation analysis. Diverse types of archaeological material require different forms of restoration, processes that take time and require temporary storage solutions and which need to be tracked.

In the last few years, the time required to process finds from commercial excavations is rarely calculated into the project at the beginning. Use of the database has provided us with more time to analyse the finds. Thus it was possible to assign 9,495 sherds of black and brown glazed stove tiles to 1,165 individual, reconstructed tiles (leaving 1,915 unassigned sherds).[5] Special finds were made of the reconstructed tiles, signifying changes in the way the finds were stored in the database. Maintaining flexibility in the structure of the database to allow these kinds of alterations is thus important.

It is also necessary to consider how the data can be made permanently available. The SQL format allows the contents of the database to be placed online, and for the data to be integrated within other database systems. This raises the question of rights-holding, a theme which we have not yet addressed due to the work load involved in processing the excavation data. Yet this topic will need to be resolved in the future since we intend to make the data available online.

A basic osteological analysis was carried out on all the 3,717 skeletons. When possible, gender, age and height were determined, as well as pathological manifestations in the bones and teeth. This information was recorded in an Excel worksheet and also uploaded into the database, linking the osteological data directly with the archaeological and geographical data. We aim next to compare the three-dimensional, topographical development of the cemetery with the development of the population over time (as represented by the osteological data). In the process, it may be possible to identify ways in which the cemetery was organised.

It was not our experience that the nature of archaeological data does not recommend itself for computer databases. For us, the use of a databases encouraged new approaches to the interrogation of the data itself. Going forward, our recommendation is for archaeologists to reconsider the ways in which different forms of archaeological data are, and can be, connected to one another through software tools. We also believe that a large quantity of new historical knowledge is still to be unlocked from existing historical databases; digital archaeology has a bright future.

[5] Melisch, C. M. (2012): Forschungsbericht Ofenkacheln. In: AiD 2/2012, 6-11. Knaut, M./ Melisch, C. M./ Radetzkyi, K./ Wemhoff, M. (2010): Erforschung, Restaurierung und 3D-Dokumentation der spätrenaissancezeitlichen Kacheln vom Petriplatz in Berlin-Mitte, in: EVA 2010 Berlin, 146–150.

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