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DIGITIZED WAX. MIEVEAL SEALS IN THE FOCUS OF CRIMINAL INVESTIGATIONS

Abstract:

This contribution covers the 3D-digitization of medieval seals: an aspect, which has up until now been much overlooked in the digitization of archival materials. In the digitization of documents, the seals attached to them, are generally not the center of attention but are instead regarded as an additional feature. The text introduces a small german pilot scheme, which attended to the previously not much-heeded fingerprints on medieval seals in 2015. A widescale dactyloscopic report based on CT-scans of seals from the city archives of Speyer was issued in collaboration with police forensics. The contribution closes on an outlook to the project's final workshop (the contributions will likely be published in 2017). The project is a small but so far almost singular effort to bring digital sigillography and forensic dactyloscopy closer together.

Keywords:

digitization, wax seals, computer tomography (CT), dactyloscopy

Izveček:

Digitaliziran vosek. Srednjeveški pečati v središču kriminalnih preiskav

Prispevek se ukvarja s tridimenzionalno digitalizacijo srednjeveških pečatov: vidik, ki je bil do danes precej prezrt pri digitalizaciji arhivskega gradiva. Pečati, ki so del dokumentov, pri digitalizaciji običajno niso v središču pozornosti, temveč veljajo kot dodatna lastnost dokumenta. Prispevek predstavlja nemški pilotni načrt, oprt na predhoden, ne preveč znan projekt iz leta 2015 v zvezi s prepoznavanjem prstnih odtisov na srednjeveških pečatih. Na podlagi CT-skenov pečatov iz Mestnega arhiva v Speyerju je bilo, v sodelovanju s forenziki, izdano obsežno daktilografsko poročilo. Prispevek se osredotoča na zaključno delavnico projekta (prispevki le-te bodo objavljeni v letu 2017). Projekt prstavlja majhen, vendar doslej edinstven poskus približevanja digitalne sfragistike in forenzične daktiloskopije.

Ključne besede:

digitalizacija, voščeni pečati, računalniška tomografija (CT), daktiloskopija

1 STARTING POSITION

The progress made in the digitization of archival material is apparent. It is however not the focal point of this short report, which will instead adress a rather important field of transmission from the middle ages and the early modern period: seals.

Seals on documents are not only their own »auxiliary science« (von Brandt. Werkzeug, pp. 132-148) in the domain of sigillography, they are also a sign of authority,

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especially in the middle ages. In the field of digitization they are however as of now rarely at the center of attention.

Seals were impressed into soft materials, most often wax, using a stamp and then attached to the corresponding document. Since the middle ages seals have been treated as foreign parts of written records in archival organization. Due to their materiality they are fragile and more likely to be damaged through normal use (for ex. frequent submission in the reading room of an archives) as well as through accidents and bad storage conditions than their corresponding document.

In big digitization projects of medieval document inventories such as the well-known document portal “Monasterium” ([www.http://monasterium.net](http://monasterium.net)) seals only play a subordinate role because of their focus on optimal legibility of writing. Their priorities lie on the accessibility of documents; the seals are generally not specially digitized but photographed together with the front and back page of the documents. This is done due to financial reasons and to optimize work efficiency. However, the seals’ digital reproduction is still “flatware” and therefore unable to correctly showcase the three-dimensionality of their picture and text composition. Users of these digital reproductions will not be able to notice important elements not least of all body traces like finger prints left willingly or accidentally in the wax.

2 SEALS AND DACTYLOSCOPY (PROJECT 2015)

Such three-dimensional digitization of medieval seals first took place in 2015 within the scope of a cooperation project between the Justus-Liebig university Gießen, the City archives of Speyer (Germany, Rhineland-Palatinate) and the Rhineland-Palatinate state office of criminal investigations, where forensics specialists were involved. The project was also a part of a habilitation project done by the art historian Dr. Markus Späth from Gießen (personal data: <http://www.uni-giessen.de/fbz/fb04/institute/kunstgeschichte/personen/spaeth-markus> - the habilitation was submitted in 2016; the chapter “Bild – Abdruck – Körperspur” [“Picture – Imprint – body traces”] is especially relevant). To simply depict the seals in separate good quality scans was not the goal of the digitization, but to generate forensically evaluable models of the fingertips imprinted deeply in the wax. The medieval town seal of Speyer was taken as an example; the results were then assigned to individual people involved in the sealing process. Through this they were able to reconstruct structures of participation in a central legal act of late medieval citizenry in the 14th and 15th century. Still various attempts to find a suitable method for the 3D-digitization of seals were necessary to reach this aim. The project turned out to be difficult to realize but far from mundane: Connecting dactyloscopic and criminological methods to sigillography had already been proposed by the French archivist and historian Gandilhon many decades ago (Gandilhon, 1931/32, pp. 98-99), it had however been deemed impossible and was therefore abandoned.

A short note concerning the object itself: The town seal of Speyer was used continuously by citizens, mayors and town council from 1231 up to the end of the town's independence as an imperial city (up to the end of the 18th century) to seal deeds and treaties.

It is beyond doubt that the 9,7 cm wide town seal with its detailed depiction of the cathedral of Speyer represents a milestone of German medieval art history. Its mould was likely manufactured by an outstanding rhenish goldsmith in the first third of the 13th century. Like many other medieval seals, the many hundred still-existing copies of the Speyer seal exhibit deliberately left human fingerprints on their backs. In Speyer however, these were left in a characteristic pattern of three finger prints in a vertical line, in which the papillary lines of the person responsible are often discernible, over the course of centuries.

Was it one person or were there multiple people respectively, who left their marks on one imprint? How long is one and the same person traceable in the repeated manufacturing process (with multiple seals in several years)?

One may ask these or similar questions when faced with these findings. A new and innovative approach of art and town history done with forensic methods gave hope to make citizen participation in a central legal act of a medieval town at least somewhat more visible. The pilot project thereby proved itself to be basically unique in Europe, next to a parallel project in the UK, which covered different questions and is being continued at present ("Imprint-project", <http://imprintproject.blogs.lincoln.ac.uk/>). The project team from Speyer or Gießen respectively was able to recruit qualified experts of criminalistics after being authorized by the Volkswagen foundation with the dactyloscopy (finger print) expert Werner Comes, as well as his co-workers at the Rhineland-Palatine state office of criminal investigations. The forensic officers of the nearby situated directorate of the criminal police of Ludwigshafen supported the project in preselecting the seals (a question: which finger prints/marks can be evaluated, which cannot?).

The Heilbronn-based specialist firm BMB (corporation for material testing mbH [with limited liability]: <http://www.bmb-ndt.de/>) produced high-resolution CT scans to be the basis of the investigation. The digitization of the seals thereby turned out to be a time-consuming process, not only because of the several transports to Heilbronn, but also because, unlike "conventional" document digitization, where seals are as a rule digitized together with front or back of the documents, CT scans require several hours plus rework time. Of the 19 ultimately forensically examined copies of seals with times of origin ranging from 1327 to 1465, eleven finger prints could be unequivocally identified.

It was, for example, shown that the imprints were made by pointer or middle fingers on all seals that exhibited more than one legible print. In addition the specialists were able to confirm that the same person was active in the municipal sealing act even over a longer period of time (for example between 1339–1344, 1359–1360 or 1453–1455/1465). The extensive dactyloscopic report by the state office of criminal investigations expert, Werner Comes, provides numerous points of reference on how to

proceed with further and, more importantly, bigger projects. The report also revealed that the digitized finger prints were not always superior to the actual prints on the original documents, which is why the imprints were additionally analyzed with “traditional” forensic methods.

3 OUTLOOK

At the close of the project on the 14th and 15th of September 2015, the project partners conducted a workshop at the “International Graduate Centre for the Study of Culture” of the Justus-Liebig University Gießen, which gave cause for intensive exchange between “digital” sigillographers or archivists from Belgium, Germany, France and the UK.

Among others Colleagues from the Belgian state archives as well as the National Archives (UK) were present. Of course, the project introduced in this contribution was also in focus. A joint publication of the revised lectures, which will then also cover a comprehensive project report, is planned for 2017. Basic information about the project as well as abstracts and presentations of the workshop in Gießen can be found on the project website (project blog, run since 2015: <http://siegel.hypotheses.org/>).

An expansion of the project to other seal transmissions in other archives would of course be desirable. Recent technological possibilities of digitization plus the connection to natural sciences make many things appear to be possible – even for the up until now marginalized auxiliary science of sigillography!

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POVZETEK

DIGITALIZIRAN VOSEK. SREDNJEVEŠKI PEČATI V SREDIŠČU KRIMINALNIH PREISKAV

Prispevek obravnava do danes precej prezrt vidik digitalizacije arhivskega gradiva. Na digitalizacijo pečatov gledamo bolj kot na »dodatek« k digitalizaciji besedilnih dokumentov iz srednjega veka in zgodnje moderne dobe.

Sfragistika, kot neodvisna pomožna veda ob robu zgodovinskih pomožnih ved, do danes ni mogla popolnoma izkoristiti možnosti digitalizacije (vključno s tridimenzionalno digitalizacijo, možnostjo CT-skenov). Prispevek predstavlja nemški pilotni načrt, oprt na predhodni, ne preveč znan projekt iz leta 2015 v zvezi s prepoznavanjem prstnih odtisov na srednjeveških pečatih. Predmet študije je bil pečat nekdanjega cesarskega mesta Speyer, ki je pomemben tudi s stališča umetnostne zgodovine; na zadnji strani odtisnjenega pečata je moč videti tipičen in trden »vzorec« treh prstnih odtisov. Projekt je bil izveden vzporedno z večjim angleškim, ki se je ukvarjal s prstnimi odtisi na pečatih (Imprint project). Šlo je za objavo forenzično obdelanih modelov pečatov in prstnih odtisov na njih. V sodelovanju s policijskimi forenziki in na osnovi CD-skenov pečatov iz Mestnega arhiva Speyer je bilo objavljeno obsežno daktiloskopsko poročilo; prstni odtisi so bili dodeljeni posameznim ljudem, vpletenim v proces pečatenja. Forenziki so kljub evforiji glede vseh možnosti digitalnih CT-posnetkov uporabljali pri opravljanju svojih analiz tudi »tradicionalne« daktiloskopske metode. Pričujoči prispevek se osredotoča na zaključno delavnico projekta (prispevki bodo objavljeni v letu 2017). Pri projektu gre za majhen, vendar skoraj edinstven poskus približati digitalno sfragistiko in forenzično daktiloskopijo. Aplikacija, ki bi olajšala prenos pečatov v arhivih, bi lahko bila v prihodnosti dobičkonosna in bi poskrbela za nove vidike v arhivih. Marginalizirana sfragistika bi lahko na tej podlagi precej profitirala.