

## Beszámoló az előző évi tevékenységről

Információtörténeti Szakosztály 2012 június

### Bevezető. Az információ-történeti kutatások nemzetközi állásáról

Az elmúlt időszak az információ-történeti megközelítés felíveléséről, megerősödéséről szólt, amelyet gyűjteményes tanulmánykötetek fémjeleznek, illetve a *Library and Information History* után egy másik volt könyv-és könyvtártörténeti folyóirat, a texasi egyetemen kiadott *Information and Culture: A Journal of History* is programszerűen címbe emelte az irányzatot. Hasonlóan látványos fordulatot hajtott végre ebbe az irányba az ún. *kognitív régészet*. Az információ-történelemhez tartozó rész-témák közül különösen felértékelődött az *akusztikus történelem* és a *fénykeltés kultúrtörténete*, az egyes korszakok közül pedig a 19 század második felének illetve a kora-modernitásnak az információ-története. Az információ-történelem pontosan abba az életszakaszba került, hogy okkal javasoltuk a pekingi történész világkongresszus kiemelt témájává emelni.

### A Szakosztály működése és a hazai információ-történeti szcéna

1. 2011 októberében a Kos szigetén megrendezendő International Conference on Integrated Information (<http://www.icininfo.net/index.php>) konferencián önálló szekciót szerveztünk *Information History: Perspectives, methods and current topics* címmel, hét magyar előadóval. A konferencia előadásai megjelentek a kiadványban, de önálló e-könyvecskeként is összeszerkesztettük. (Mellékletben).
2. Ezt követően hét alapító taggal 2011 októberében megalakult a *Szegedi Információtörténeti Műhely*, amely, immár 13 fősre bővülve 2012. március 29.-én félnapos szakmai workshopot tartott 11 előadással. (A konferencia előadásainak leírásait tartalmazó programfüzetet, benne a SZIM alapító okiratával, ld. szintén mellékletben).
3. Lezártuk a szerkesztését az AETAS c. folyóirat 2012 második felében esedékes információ-történeti tematikus számának (a még nem végleges tartalomjegyzéket ld. mellékletben).
4. „Az információ-történelem klasszikusai” sorozat számára egy TÁMOP-projekt keretében *Hajdu Helga* két híres művének németről magyarra fordítása, a külföldi klasszikusok közül *Harold Adams Innis* valamennyi kommunikáció és történelem kapcsolatával foglalkozó munkájának (3 könyv, egy füzet és a vonatkozó tárgyú kéziratok) magyarra fordítását fejeztük be, elindítva mindkét könyv esetében a kiadás-előkészítést.
5. A Signum nevű markológiai tudományos társaság (International Society of Mark Studies, <http://www.markstudies.org/>) 2012. októberi, stockholmi konferenciájára (II. Signum Mark Studies Conference) mi gondoztuk a „The History of Information Architecture” c. szekciót (5 magyar és egy francia előadó lesz benne).

## **Tervek**

1. Az információ-történeti kutatásokkal foglalkozók 42 fősre duzzadt levelezőlistáját részben tovább bővítjük, részben csak az aktív tagokat tartjuk meg rajta.
2. A Szegedi Információ-történeti Műhely 2013. évi konferenciájának témája az *orvoslás információ-története* lesz, a felhívás hamarosan megjelenik a Műhely készülő honlapján.
3. 2013 tavaszán megszervezzük a hagyományteremtőnek szánt Vonyarcvashegyi Információ-történeti Napokat (WIN), az információ-történeti kutatásokkal foglalkozók családi hangulatú munkatalálkozójaként.

Szeged-Budapest, 2012. június 23.

Z. Karvalics László

# INFORMATION HISTORY: PERSPECTIVES, METHODS AND CURRENT TOPICS

THEMATIC WORKSHOP AT THE IC-ININFO (INTERNATIONAL CONFERENCE ON INTEGRATED INFORMATION)

Kos, Greece, October 2., 2011



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# EMERGING RESEARCH FIELDS IN INFORMATION HISTORY

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**Abstract:** After providing a fresh information history basics we roughly present three new, promising, deepening domains with growing importance, getting progressively into the center of intensified scholarly attention: *History of Information Architecture, Complex History of Measurement and Information Archaeology.*

**Keywords:** information history, information architecture, information archaeology, measurement history

**DOI:** It would be provided by publication house

## I. INTRODUCTION

„The field of information history has only been seriously theorized and discussed as an independent area of scholarship over the last ten years or so, and there remains much to be done in order to bring it into the wider academic spotlight. However, during this same period, scholarly work on information in history has been abundant and ever increasing”.

Toni Weller (2010a) presents the growing importance of information history research in her latest review in this way. Thanks to the emerging domain and the focused attention, information historians are facing with enormous challenges: deepening, enhancing and intensifying the „multitude” with new scholarly approaches, re-interpretations, experimental papers, and, simultaneously, setting up new theoretical frameworks, models, definitions, producing literary steps to the more and more needed synthesis.

Few years ago I tried to identify several rising information history research topics (trade routes as information channels, translation history, typologies of information revolutions, early networks and information flow, etc.) in a Hungarian language monograph (Z. Karvalics, 2004). In this paper I roughly present three new, promising, deepening domains with growing importance, getting progressively into the center of intensified scholarly attention.

Before that it seems to be indispensable to define the information history as a relatively new paradigm (Black, 2006, Weller, 2008, 2010) and summarize its main research directions for all those, who meet first time with the information history discourse itself.

The legacy of information history is a programmed re-discovery, re-conceptualization and re-interpretation of well known forms, technologies, tools, institutions, activities, flows, specialists and lot of other aspects of the universe of information and knowledge, transforming them a direct object of targeted research instead of

their traditional, simple supporting role of economic, political, cultural, legal, military (etc.) history writing.

It is easy to find information history relevance in every geographical and chronological crosspoints of the history of mankind. However, the theoreticians of information history could identify five or six special “domains”, research directions, schools, representing different approaches, aspects or topics.

	Z. Karvalics (2004)	Weller (2008)
1	Information-centered analysis	Cultural and social aspects of information
2	History of Information metabolism (sub)systems	History of Information Systems and infrastructures
3	Social history of Information Technology	Library and Book History
4	The History of the Information phenomena	The history of Sciences, dealing with the phenomena of Information
5	Pre-history of Information Society	Origins of Information Society
6	General Information History	

**Table 1.** Main research directions of Information history

“*Information-centered analysis*” focuses on a given historical period, process, or event and utilizes an information approach to achieve a better description of its subject.

The concept of an “*information-metabolism system*” places the complex set of information processes of a given era or of a given area into the focus of investigation.

The *Social History of information technology* is a multidimensional study of given information activities, information technologies or information institutions in a far more complex way than the simple description of the invention processes and their results as a tools, objects or methods.

The “*history of information*” (or the *natural history of information*) scrutinizes the information phenomenon, both in its qualitative and quantitative aspects, as a basic organizing principle of living systems, beginning with the emergence of early representation systems (Levinson 1997).

The *Pre-history of Information Society* is a constant investigation to find the historical roots of the contemporary post-industrial society. Beniger (1986), Black

(2001) and Weller-Bawden (2005, 2006), Weller (2009) are digging back to the mid-19<sup>th</sup> century, other scientists (Mattelart, 2001, Headrick, 2001, Darnton, 2000) propose to start the storytelling in the late 18<sup>th</sup> century.

"*General information history*" aims to develop a valid model and a uniform terminological texture of information-based historiography, as applied to the process of world history (Weller, 2008, 2010b).

Information history research domains are appearing in almost all these directions in varicoloured ways. It is time to zoom for the selected few "streams" of the literature to illustrate the latest improvements. I call them in order *History of Information Architecture*, *Complex History of Measurement and Information Archaeology*.

## II. HISTORY OF INFORMATION ARCHITECTURE

In the mid-11<sup>th</sup> century hermetic text, named *Picatrix* we can read about a large mythical city, Erdetentym (Adocentyn). All around outside the walls of the city Hermes lined up pictures in a well composed structure to influence the habitants' life and moral.

The "pictured wall of Adocentyn" represents only a short chapter in a history of (built, made, spun, carved, fabricated) artificial objects in closed or plain air space for *intentional information and knowledge management purposes*, i.e. memory support, warning, orientation, navigation, education or coordination, etc., from small items (aboriginal cycons, lunar calendars, stone landmarks, metes and bounds, advertisement tables in Pompeji, scratched beggar signs on walls) to complete architectural objects (lighthouses, clock towers, code steles, like Hammurapi's, etc.). The Roman *portico* and *exedra* was designed for triggering the thoughts and the *cubiculum* to host the meditation. The Renaissance *studiolo* has educational and memory training functions. Kirkbride (2009) could show that the famous Gubbio and Urbino studiolos of Federico da Montefeltro were simultaneously *recombinatoriums* to generate new ideas.

The other aspect of information architecture is the art and profession of *presenting, arrangement, structuring, combining, sizing, coloration of the sets (clusters) of information on the given information carriers* for the most effective transmission of meanings, relationships and contexts. The alphabetic order used for information storage by the early encyclopedia makers was an information architecture innovation. The *history of mapping* and the *history of typography* are also sub-domains of this "Infographic History".

The excellent review of Friendly (2009) presents more than 330 bibliographical items, listing the milestones of Infographic history. We observe growing interest about the life and work of *William Playfair* (1759-1823) the inventor of modern diagrams (line graph, bar chart, pie chart and circle graph), developing them between in 1786 and 1801 in his *Commercial and Political Atlas and Statistical Breviary* re-published few times since the late 18<sup>th</sup> century. However, the "diagram

history research" is going back to the early medieval times, see Kühnel (2005) about the "Karolingian infographics".

Summarizing the prospects of research on early forms of information architecture, there are open doors and windows to expand and augment the concept of environment in historical context, shifting the reconstruction of *Information Environment* aside of other popular and well-processed "environments" (ecological, geographical, settlemental, political, etc.).

## III. COMPLEX HISTORY OF MEASUREMENT

At the end of the 16<sup>th</sup> century Tomas Digges has proudly constructed his *Pantometria*, the science of *measurement of everything* (Digges, 1591). Later, Theodor Mommsen, the famous 19<sup>th</sup> century archaeologist and linguist was standing the art of measurement aside to writing in his influential *Römische Geschichte's* (1854-1856) 14<sup>th</sup> chapter (Measurement and writing) as the most important tool of mankind while conquering the World. After all, the positivist turn degraded the role of history of measurement to be a useful and diligent *auxiliary science* of economic history and history of technology and science, with a clear mission: to collect, list, explain and interpret every small and even local units of weight, length, size, distance, time, value, etc. in encyclopaedic form with concordances, supporting the scientific papermakers with up to date conversion tables.

In the last decade, blissfully, a new and prolific era of more and more complex history of measurement was born. The bugle call for a re-emancipation was an important book of Witold Kula (1986) with a strong need to find macro-patterns and longitudinal relations, getting over the good old measurement unit reconstructions. Few years later Crosby (1997) made a giant step towards creating a complex measurement history framework, analyzing the role of quantification in pre-modern Europe. But the real "detonation" of the socially, economically and culturally embedded measurement history is taking place ahead of us. Morley and Renfrew (2010) edited an excellent book on the holistic role of measurement in ancient societies, exploring archaeological evidences. Gooday (2011) "*shows how the advent of commercial electrical lighting stimulated the industrialisation of electrical measurement from a skilled labour-intensive activity to a mechanised practice relying on radically new kinds of instruments*" (as the product description briefs). Allen (2011) explains the revolution of (governmental and corporate) control bodies with the innovations of standardization and performance management, putting a new "puzzle" to the analysis of industrial revolution.

## IV. INFORMATION ARCHAEOLOGY

The school of cognitive archaeology (see Renfrew, 2009) puts the thinking process into the center of the

examinations, using such a concepts like symbols, beliefs, motivations, or - *horribile dictu* - ideology. Otherwise: they are dealing with the *prehistory of the mind* (Mithen, 1996).

Information archaeology is a kind of vestibule of cognitive archaeology, focusing the basic perception and information sharing processes.

The *artificial lighting*, for example, has a 70.000 years old history, and we have iron age evidences of *light telegraphy*.

The acoustic factor is falling into line with the visual: the new, most popular targets are the (many a time 30000 years old) *musical instruments* (the discourse is now about the tuning of the flutes, and the scientists are trying to play on them experimentally) and the *ancient rock gongs* (a giant piece was found recently by a Westfälische Wilhelms-Universität Münster researcher, Tim Karberg, in Sudan). The archaeologists could also identify lot of important acoustic moment studying prehistoric *Maltese temples*, *Stonhenge ruins* and the pre-columbian civilizations in the Andes and Mezo-America. John Rick discovered a special voice-duct system in caves, used by the religious leaders of ancient *Chavín de Huántar* civilization, and Jonathan Abel (Stanford University) identified them later as “acoustic weapons”. (Kolar et al., 2011).

And this is not the end. In a previous monograph on the cultural history of smell (Classen et al, 1994) the authors could compose an almost 40 pages chapter about the *aromas of antiquity*. The research of *early hallucinogenic materials* now locking into each other with the *interpretation of cave drawings and paintings*.

However, and of course, the primary target of information archaeology is the *objectivated information itself*: pre-writing marking systems, signs, tamgas, motifs, symbols. The families and clusters of these signs, their inter-cultural migration, recombination, development or reuse. The discovery of previously unknown cave paintings and drawings, petroglyphs, scratched bones and other archaeological objects and the growing publicity of these results are gradually enhancing the need for a worldwide, unified pool of the mankind’s full early sign asset (a well designed, conceptually univoque, quality assured, open online database). Probably the brand new International Society for Mark Studies, *Signum* will undertake this lesson. Their coming out book (Pim et al., 2010) seems to be a good starting point.

## V. CONCLUSION

It was strongly arbitrary to choose these three research domains and call them “rising”. However, we are absolutely sure that in the next few years we’ll meet lot of excellent and thought-provoking new books and papers on these topics, affecting and touching many information history directions. Instead of mentioning again the names, I try to denominate the next generation “hot domains” in information history. My prediction is

the accelerating strengthening of the following four topics:

- *History of Data Culture*

(The origins of data recording, early database technologies and the formation of complete data cultures, including standards, specialists and user training)

- *Early warning, alarming and signalling systems*

(Especially the history of fire services and other *disaster prevention* technologies, like the old tsunami stones in Japan. This direction is also in close connection with the *paleoastronomy*).

- *Origins of numeracy*

(New evidences are expected about the Neolithic roots. Concerning to the early civilization centers’ numeric culture, the revival of *accounting history* is foreseeable.)

- *Information management protosystems*

(Professional “workflow” of state and corporate bureaucracies, in particular in the early modern Europe and the century of the control revolution – from mid-19th to mid-20th century (Beniger, 1986).

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# Information management through elementary data clusters – New observations on pridianum-type Roman statistical documents

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**Abstract:** *The topic of this article is the comparative analysis of the data structure of the extant pridianum-type documents from the Roman Empire. The pridianum is a report on the status and the changes of a cohort, which was compiled once or twice a year. Though we don't have any contemporary sources on the data recording methods of the Roman army, with the analysis of these documents we can discover some regularities referring to conscious recording of statistical data. These regularities in the macrostructure of documents also can help us to get more information about fragmentary documents.*

**Keywords:** *information history, military records, pridianum, Roman Empire, statistical documents*

**DOI:** It would be provided by publication house

## I. INTRODUCTION

All of our information about data being recorded in the Roman Empire came from primary sources: papyri, tables and inscriptions. In my paper I will present a small part of a research with a purpose to examine the data structure of these records. The aim of this research among others is finding similarities and regularities in the records and discovering some conventions, in order to gather new information about the methods of recording data in the Roman Empire.

The main objective of the first phase of the research was the methodical grounding of a comprehensive study on the macro and microstructure of these documents. The latter stages will demand the analysis of significantly more documents.

## II. THE PRIDIANA

The topic of my paper is the comparative analysis of the extant documents of a certain type. This type is the *pridianum*, a report on the status and the changes of a cohort, which was compiled once a year – twice a year in Egypt (Fink, 1971). Four *pridiana* and another *pridianum*-type document are extant from the Roman Empire, but one of these, the ChLA 501 is not suitable for the analysis, because only the first lines of this document are intact.

The earliest of the four documents is from the end of the first century AD from Vindolanda, a Roman fort in Northern Britannia, its tablet number is 154. It is accessible at the Vindolanda Tablets Online database. This is not a *pridianum*, just a *pridianum*-type document, as the article of Bowman and Thomas (1991) states: *it is per*

*haps more likely to have been an interim report compiled for the commanding officer.*

The CPL 112 or RMR 63 papyrus, published by, among others Fink (1971), was written in Moesia in the Balkans between 100 and 105 AD.

The PBrook 24 papyrus, published by Thomas and Davies (1977), is very fragmented, but on the basis of its content it can be doubtlessly classified as a *pridianum*. It was written in Egypt around 215 AD.

The BGU 696 or RMR 64 papyrus is from the middle of the second century AD from Syria. It is the *pridianum* of the *cohors I Augusta praetoria Lusitanorum equitata*. We only have the first section of this papyrus, which informs the reader of the arrivals of new soldiers in a regular structure.

The four documents of the same type came from different times and places, so with their analysis we can draw up some universal statements about the *pridiana*.

## III. STRUCTURE

Analyzing the data structure of the documents I have sorted them observing two criteria:

1. Graphic structure (primitive tables or simple text)
2. Regularity

Three of the four examined documents are regular, graphically structured documents: the British, the Moesian and the Egyptian documents, while the fourth document has some regularity and is slightly structured, but not as much as the other three.

These documents demonstrate that data recording personnel of the Roman Imperial Age often made an effort to graphically structure the data. These so-called tables could be very useful regarding the handling of these documents.

### A. The Tab. Vind. II. 154

In the British document a graphically structured section (line 5-27) follows a four line long introduction that details the date, the name of the cohort, the prefect's name, the net number of the soldiers and the number of centurions. Following the *ex eis absentes* (of whom there are absent) expression the graphically structured section begins. This so-called table consists of two graphically separated columns and the second column always contains a number.

This section divides the cohort in two parts: absent and present soldiers and the latter has two subgroups, one detailing the sick, and one detailing the healthy



people. There are three kinds of lines in this document: status-describing lines, summing lines and detailing lines. These indented lines inform us, if there are any centurions in a single category (for example in line 7-8: at Coria 337 / including centurions 2).

### B. The PBrook 24

The PBrook 24 can be divided in three sections: the first one elaborates the arrivals of new soldiers, the second contains data about deceased or permanently departed soldiers and sums the actual manpower of the cohort, while the third one details the temporarily absent soldiers' numbers and the causes of their absence. The document contains the same three line-types as the previous.

Though this document is not as regular as the British or the Moesian, it has some eye-catching regularities. For example if a single detailing entry occupies two lines, the second one is always significantly indented.

### C. The CPL 112

The CPL 112 is also a regular document. Two columns are extant, but the first 19 lines of the first one are almost completely destroyed. The most that can be said is that at the end of lines 12-19 there are dates and city names. This section probably contained information about the date of arrivals into the cohort and the origin of these soldiers. After line 21 the text details the actual number of the cohort on the 1st of January, then the arrivals between January and September, and the last entry of the first column sums the number of the cohort. There are also detailing lines after the summarizing lines.

The second column can be divided in three parts; all of which have a headline. The first one informs of lost soldiers, the second of temporarily absent soldiers, who are outside the province, and the third of *intra provinciam* absent soldiers. The numbers are always on the right-hand side, as in the previous two documents. This papyrus has also detailing lines and summarizing lines.

### D. The BGU 696

The first 18 lines of this document contains an introduction of the *pridianum* that is similar to the first lines of the British document. This section is followed by the enumeration of soldiers who arrived at the cohort between the 1st of January and the 31st of August. The order of data is strict: 1. Origin, 2. Rank and number of simultaneously arriving soldiers, 3. Detailing line (if needed), 4. The *centuria* or *turma* of the soldier (not always represented), 5. Starting year of soldiering, 6. Name, 7. Date of arriving. If more than one soldier arrived simultaneously, the last four elements are repeated. If the fourth and the fifth are the same, only two last two are repeated.

The order and the disclosure of the data is regular, but their arrangement seems to be random. After analyzing it, the document contains some more regularities in structure, thus it can be classified as a graphically structured, but not strictly a regular document. These regular-

ities are, for example: the number of arriving soldiers being always represented on the right-hand side, the more or less consequent use of line breaks, and the conscious use of two different styles of writing, the latter is confirmed by Fink (1942).

## IV. MACROSTRUCTURE

If we try to compare the macrostructure of the *pridiana* we cannot use the BGU 696 document, because its remaining part contains only the first two elements of the fourteen.

With the CPL 112, the Tab. Vind. II. 154 and the PBrook 24, we have an opportunity to draw up a universal picture of the macrostructure of the *pridiana*. It is not a problem that the British document is not specifically a *pridianum*, just an interim report, because its content is parallel with the other two documents' similar sections. At first glance, the following are common in the three documents: summarizing lines, detailing lines and the representing of numbers on the right side of the document. The following table shows the sections of these documents:

	TV II 154	CPL 112	PBrook 24
1. Earlier net number	-	I 26-28	?
2. Arriving soldiers	-	I 29-34	I 1-18
3. Summarizing the 2.	-	I 35	?
4. Net number (with the lost)	-	I 36-II 2	?
5. Lost soldiers	-	II 3-11	II 1-6
6. Summarizing the 5.	-	II 12	II 7-9
7. Arriving stragglers	-	II 13	-
8. Actual number	3	II 14-16	II 10-12
9. Temporarily absent soldiers (see below)	4-16	II 17-37	II 13-III 18
10. Summarizing the 9.	17-18	II 38-40	?
11. Summarizing the present	19-20	II 41-43	?
12. The out-of-service soldiers	21-24	II 44-	?
13. Summarizing the 12.	25	?	?
14. Summarizing fit soldiers	26	?	?

**Table 1.** The macrostructure of *pridiana*

I used question marks, where the part of the document is lost, and dashes, where the given section does not appear in the document. The detailing lines don't appear in the table, as the use of these is not as consequent, as the other elements'.

All of the differences between the extant parts of the documents can be adequately explained, so the similarities become even more striking. The first difference is the lack of the first seven elements in the British document. One possible explanation is very simple: the net

number of the cohort did not change since the last interim report. As we cannot say anything about the interval between the recording of two interim reports, it is a mere supposition, but if the speculated time was short enough, the explanation is acceptable.

The second difference is in the section of temporarily absent soldiers. The CPL 112 document divides this section in two parts: absent soldiers, who are outside the province, and *intra provinciam* absent soldiers. This difference can be explained as well, if we think about the size and the location of the provinces. The CPL 112 is from Moesia, what was much smaller than Egypt, so it is more likely that a soldier was sent to another province from there, than from the Egypt. The same can be said about Britannia: if someone would be sent to another province, he would have to cross the sea, so it is not probable that someone was sent to another province from there.

The third difference is the lack of the entry about stragglers on two documents. The explanation of this is much more simple: if this kind of event didn't occur, this element had been skipped.

It seems there are no more differences between the macrostructure of these documents, but we can't state that with confidence as two of the three documents are fragmentary. On the grounds of what we have, we can draw up a more accurate hypothetical picture on the macrostructure of the *pridiana*:

1. Earlier net number
2. Detailing and summarizing of arriving soldiers
3. Net number (with the lost)
4. Detailing and summarizing of lost soldiers
5. Arriving stragglers
6. Actual number
7. Detailing and summarizing of absent soldiers
8. Summarizing the present soldiers
9. Detailing and summarizing of out-of-service soldiers
10. Summarizing of present fit soldiers

The first five elements appear only if the net number of the cohort changed since the last report. The second section, the third and the fourth section, and the fifth section only appear when soldiers arrived, became lost or a straggler arrived respectively. If it is necessary, the seventh section is divided, and soldiers absent inside and outside the province are represented separately.

This structure is not weakened by the extant part of the fourth *pridianum*, the BGU 696. This part contains the first two of the ten aforementioned elements, but we don't have any reason to suppose that the whole document did not record all of these sections. After an introduction, the line 14 of the first *columna* informs us about the previous net number of the *cohors I Augusta praetoria Lusitanorum equitata*, the next three lines are detailing lines, while the second section starts at line 19 and covers the whole extant part of the document.

In his book, Erdkamp (2011) presents a sketch of the structure of *pridiana* that he calls "Summary of structure of ideal *pridianum*." His description can hardly be

accepted, because at many points it doesn't match with the extant *pridiana* and with the structure demonstrated above.

## V. RECONSTRUCTION

Finally I would like to present possible further results of this kind of research. If we discover regularities in the macrostructure of documents, it may help us acquire information about fragmentary documents.

For example it could act as a base of finding out the original length of the fragmentary PBrook 24 *pridianum*. In their article, Thomas and Davies (1977) discussing the document state that "*All three columns are incomplete at both top and bottom, and the loss here is much harder to estimate.*" I wish to draw up a hypothesis determining the length of missing sections on the grounds of the CPL 112 and Tab. Vind. II. 154 *pridiana*. This reconstruction is very hypothetical, but in my opinion we can make very close estimations with the help of the regular structure, the other *pridiana* and a bit common sense. In the table the extant parts are written with roman typeface, and the lost parts with italic.

	col. I	col. II		col. III	
<i>Introduction</i>	5	<i>Net number with the lost</i>	3	<i>Absents</i>	8
<i>Earlier net number</i>	3	<i>Lost soldiers</i>	5		
Arriving soldiers	18	<i>Lost soldiers</i>	9	<i>Absents</i>	18
		<i>Summary</i>	3		
		<i>Absents</i>	3		
		<i>Absents</i>	16		
Arriving soldiers	10			<i>Summary</i>	3
				<i>Presents</i>	3
				<i>Out-of-service</i>	4
<i>Summary</i>	3			<i>Fit soldiers</i>	3

Table 2. Hypothetic reconstruction of PBrook 24

Before the entry about arriving soldiers only the earlier net number of the cohort is missing, and the detailing of arriving soldiers certainly started at the first extant line of the document, because there is a kind of headline: *accesserunt*. Before that there was an introduction that in my opinion was short like in the British document, otherwise the entry about lost soldiers would have been too long. On the grounds of that about eight lines lost from the top of the second column, in my opinion here was the entry of net number with the lost soldiers that in my opinion was three lines long. Because that was followed by a so-called headline for the detailing of the lost soldiers, probably the summary of arriving soldiers was in the bottom of the first column.

The following part of the reconstruction is mainly affected by the missing part of the end of the document. We may presume that the detailing of absent soldiers ended in the last extant line of the document, because

this section is already forty-five lines long, so it is not probable that it continued any longer. This is followed by its summary and the last three mandatory elements.

With this reconstruction one column of the document is thirty-nine lines long, and this is an acceptable length based on the length of other documents. As I already said, this kind of reconstruction is very insecure, and is just a hypothesis, but it is also a good example for the possible results of analyzing the data structure of these ancient documents.

## VI. CONCLUSION

Though the time and place of these documents' birth are far from each other, we can discover striking regularities between them. The interval between the oldest and the newest documents is nearly one hundred and fifty years, and they came from four different places: one from Britannia, one from the Continental Europe, one from Africa and one from Asia. The fact that, despite this distance, there are strong similarities between the documents implies that we can suppose something in the background of the *pridiana*. This may be the centralised briefing of their format, or the emission of a pattern demonstrating that, or maybe the military management sent a guide to the cohorts describing the methods of statistical data's recording.

The choice between these alternatives could be only a guess. However it looks like certain that the empire and the military leadership ensured that the recording of the *pridianum*, maybe the most important document-type of the army, produce perspicuous and manageable documents, and that could be crucial to the administration of the nearly half a million soldiers of the Imperial Roman army.

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# Information and Secrecy on the Silk Road. Methods of encryption of legal documents in Inner Asia (3th-4th century)

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**Abstract:** *The aim of this paper is to provide an overview of studies concerning the linkage between the very complex system of the great Inner Asian Silk Road and the history of information. In an era where literacy was acquiring larger and larger importance beside the verbal information transmitting methods, the “filtering” (that is, privacy management) techniques became especially important, whose purpose was to keep the information inside a defined circle by the encryption or coding of written documents. Hence this paper cover not just general problems of transmitting information along the Silk Road, but also deals with the special methods of encryption or coding of Kharosthi documents. These legal documents can shed light on everyday life of the Silk Road during the 3<sup>th</sup>–4<sup>th</sup> centuries, and they help us understand processes of administration, diplomacy and information techniques of that era.*

**Keywords:** *Silk Road, methods of encryption, legal documents, seals, Aurel Stein*

## I. INTRODUCTION

The examination of the complex phenomenon of information has cut out a significant slice of the space of scientific disciplines covered by the larger fields of information technology, economics, etc. The examination of the history of information in itself has become such a broad research area that we can almost consider it as an independent discipline. Questions like the history of the flow of information, which examines/examined the speed, the intensity and the topology, etc., of information, dispose of literature sufficient to fill a whole library. The thorough investigation of the most important trade routes of world-history raises some really exciting questions of information topology. While until the last decades of the twentieth century these trade routes had been regarded primarily as the movers of the circulation of the economy, or the scenes of the spread of culture, religion, and artistic trends, today more and more are drawing our attention to a more complex role of the network of such routes. The spread of information and innovation would have been much slower and complicated without the network in all certainty. Thus, these commercial systems functioned not only as a cache and generator (not to a small extent contributing to the ever accelerating pace of the growth of the common human knowledge, which now is almost advancing at the speed

of light), but due to certain counter-mechanisms they operated as an information filter, as well. The examination of these “filters” is an especially exciting, though almost undiscovered research area.

## II. SILK ROAD AND INFORMATION

A certain piece of information, an innovation, an invention ensuring positional or strategic advantage to its owner meant such value (as it does today, too) that motivated its proprietor to make serious efforts to preserve it. Thus, two basic factors clashed on these routes: to use a modern simile, the first was the free and flexible handling of information in a basically open source coded commercial system, and the other was the efforts to preserve and keep information secret. To illustrate this thought with a specific example: the functioning of the large commercial system discussed in my presentation, the Silk Road, which connected China to Rome and then to Byzantium on one hand, served China’s economic and political interests, on the other hand the secret of silk making becoming public was all the time considered as a serious loss to be avoided, so they tried to delay its happening as long as possible. Consequently, China tried to keep secret the way of silk manufacturing not only by legal, but also by administrative and military means. This worked so well that nothing was known about the nature of silk in the ancient Mediterranean before the arrival of the first cocoon in Byzantium. The people of the time had silk in their hands, they often took it apart into threads, but they could not exactly say what this great fabric was made of (Höllmann, 2004).

Thus, in this case we can speak about a kind of guided information filtering. At the same time there were filters in the system that did not inevitably worked due to state or “upper” will, what is more, in certain cases we can question intentionality in connection to them, nevertheless, these filters served the real or presumed economic, political, etc., interests of some states, social classes and communities well. The length of certain trade routes, the number of intermediaries or intermediary languages involved in the process of trade could be such factors in themselves. Each one of these factors could contribute to the slowing down, to the distortion, or God forbid, to the complete blocking of information. Because of the above factors it was clearly known already in the 19th century that, theoretically, the most valuable sources along the Silk Road are those which have a relatively small number of the intermediaries mentioned, thus the information goes through rela-

tively few filters (Elisseeff, 2000). Exactly that is why Marco Polo's travelogues were regarded among the most important medieval sources for a long time. The author had travelled all along the Silk Road to China, according to earlier theories, thus, his account is of first hand information, and the number of "filtering factors" is low in his book.

However, in his work, which has a new approach, a british China expert Frances Wood claims, opposing earlier theories, that Marco Polo's book is a typical example for the effects of the filtering factors mentioned. As it turned out, Marco Polo uses the Central Asian and Chinese proper nouns distorted, in Persian transcription, most probably he did not speak Chinese. Furthermore, there are several items in the book the authenticity of which can be doubted – and not because of the characteristics of the medieval genre. In addition, there should be a number of other things in the book if Marco Polo had really been to China. In Wood's final conclusion, Marco Polo had never been to China, and information reached him distorted and rarefied by many filters (Wood, 1995).

In an era where literacy was acquiring larger and larger importance beside the verbal information transmitting methods, the "filtering" (that is, privacy management) techniques became especially important, whose purpose was to keep the information inside a defined circle by the encryption or coding of written documents.

The wide range of encryption and coding is as old as information itself. The appearance of writing involved the appearance of sophisticated techniques of written encryption. Even in the cases of the earliest written records technologies obstructing the widespread of information were observed: closed envelopes, the use of seals, the coding of texts, or ciphers, all served the purpose of making information in the text available only for those whom it was destined to. Unfortunately, we know relatively little about these methods in the late antiquity due to the scarcity of archaeological material, consequently, findings providing information on the sophisticated methods of encryption from this period from the Central Asian section of the Silk Road are especially important.

### III. METHODS OF ENCRYPTION OF LEGAL DOCUMENTS IN INNER ASIA

In his expedition to the Central Asian Silk Road the Hungarian-British archaeologist Aurel Stein discovered an ancient town in ruins in 1900, in the area of today's China, at the edge of the Taklamakan Desert (Mirsky, 1977). Among the ruins of Cadota, a settlement flourishing in the third and fourth centuries AD, he unearthed hundreds of written documents. These documents, written with the so-called Kharosthi writing and preserved in an excellent state in the sand of the desert, depict an

incredibly exciting picture of the social, economic and cultural relations of the age (Atwood, 1991). They shed excellent light on the earlier unknown history of the Central Asian expansion of the Indian culture, and they also provide an insight into the everyday life of people once having lived there. The documents are especially important apart from their content, since their raw material, manufacturing, authentication, encryption technique make them unique documents on the chancellery practice of the age.

The majority of the documents were made of wood. (Few manuscripts written on leather were also found, but no paper or other materials were used to write on in Cadota.) The documents were created in an area where palm leaves, or birch bark could not be found, that is, there were no such raw materials which were widely used to write on in India and China at the time (Felföldi, 2005).

The "wooden papers", obviously made in the place by local joiners, are special regarding their shape, as well. Basically they can be divided into two main groups: elongated, wedge-shaped pieces, and rectangular ones. In the case of these documents the criterion of "content in the form" is really valid, since the different shapes were used for different purpose. Official messages, legal documents and the most important contracts were written on rectangular wooden tablets, while data referring to court cases, shorter messages, short orders and instructions were written on wedge-shaped tablets. The exact and accurate naming of the tablet types also appear in the documents (Burrow, 1940).



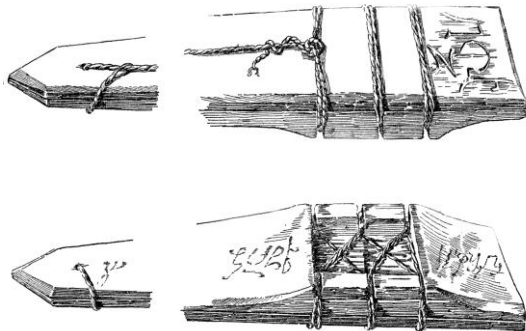
Figure 1. Rectangular double tablets

Thus, without exception, these tablets have important information on them. To hide and keep information secret, an exceptionally elaborate and sophisticated method was used by the literate of Cadota. The wedge-shaped and rectangular wooden tablets each had two, perfectly fitting pieces. In the case of the wedge-shaped tablets the lower piece and the precisely fitting covering piece were carved out of one single piece with the use of a saw. In the cases of the elongated, rectangular documents the lower and the upper pieces were not exactly the same. The lower tablets were a little longer, and their shorter sides had two prominent edges, which served as a frame, ensuring the perfect slide of the smaller covering tablet into the lower tablet. The majority of the text was on the lower tablet. If there was

not enough space for the text on the lower tablet, it continued on the interior side of the upper tablet, but well-hidden from unauthorized eyes in any case.

The text hidden in this way was made even less accessible by the use of special cording, and seals.

In the cases of the wedge-shaped double tablets a hole was drilled in the pointed end of the tablet through the lower and the upper piece, and then, in the wider end a rectangular shaped indentation was carved. The wood was thicker here than in the pointed end, and the edge of the indentation stood out of the plane of the tablet perceptibly.



**Figure 2.** Wedge-shaped tablets

After preparing the document the cover tablet was placed onto the lower tablet, and a cord was pulled through the hole drilled in the more pointed end, and in the end, the cord was strained towards the indentation in the wider end of the tablet. The edge of the indentation was scarified, helping to keep the cord stable, which was driven through the indentation several times, straight and diagonally, as well. The cord fixed in this way was strained, tied, and the indentation above it was filled with clay. The official seal of the sender, or of the person requesting the documents, was printed here.

The rectangular wooden tablets were not drilled through, only the closing cord was wound vertically and diagonally multiple times above the carving above the indentation made for the seal of these “letters”. Soft material was put on the cords, and seal was printed in it in this case, as well (Stein, 1907).

The seal prints found in Cadota could provide enough material for another, separate presentation, since they give an authentic evidence of the unique mixing of cultures along the Silk Road, of the intermingling of the Chinese, Indian, Persian, and ancient Greek and Roman civilizations. The seals of the documents that were found in the peripheries of China, written in Indian language and writing, although presenting more Central Asian character in their material, depict the Greek gods of Hellas of thousands of kilometres away, Eros or Pallas Athena, proving the cultural multi-colourness of the Silk Road in the third and fourth centuries.

Aurel Stein found several open, and seal-less documents on the site, but there were dozens of documents

where the tablets, their cords, and their wonderful clay seals were intact. A large part of these double wooden tablets revealed their secrets only after being cut in the British Museum, over 1600 years after being closed and sealed (Stein, 1921).

Obviously, this sophisticated system did not take shape in Cadota which had only prospered for a few decades in the turn of the third and fourth centuries, but another, mature and previously tested chancellery system was adapted to the local conditions. Thus, it is an important question where the excellent and complex system of encryption originated from out of the above mentioned cultures (Chinese, Indian, Iranian, ancient Greek and Roman civilizations). Unfortunately, the majority of the geographical conditions of the above mentioned great civilizations are such that do not make possible the survival of numbers of documents made of similar organic material. (No similar written document has been found in any of the above mentioned great civilizations.) The majority of the records written on perishable material have not survived, or have survived in very limited numbers in the normal climate of both India and the Mediterranean. In spite of this, there are certain signs that make it more or less possible to localize the birthplace of the technology. In one of his later expeditions Aurel Stein found the predecessors of these strange letter papers and envelopes in hundreds of years older excavation layers, much closer to the China in the strict sense, hundreds of kilometres to the east of Cadota, next to Dunhuang. So it seems highly probable that this encrypting and authentication method appeared more to the east, a few hundred years earlier, and it spread westward to become a definitive element of the chancellery practice of Cadota during the third and fourth centuries.

Thus, in lack of evidence, we cannot exclude completely the possibility that the birthplace of the complex, sophisticated technology was India or another region, nevertheless, the probability of the method’s arrival in the sand dunes of Taklamakan along the Silk Road from China is still higher.

And what secrets did these documents guard so carefully? Besides meticulously worded contracts on land purchase, or secret reports on the movements of Barbarians appearing at the frontiers, they contain information on all things that were important enough for a few people, or the local ruler, or his top rank officials to try to keep their content away from everyday readers as carefully as they, or their means could realize it.

#### IV. CONCLUSION

The image of another life has gained shape by today under the surface of life along the Silk Road (commerce, diplomacy, politics, etc.), where the acquisition and the hiding of information were in a fight of alternat-



ing success, sometimes deploying the devices of high politics, sometimes the simple devices of the chancellery of a small town. The stakes were obviously different, the means may have not.

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# THE ROLE OF INFORMATION AND DISINFORMATION IN THE ESTABLISHMENT OF THE MONGOLIAN EMPIRE – A RE-EXAMINATION OF THE 13TH CENTURY MONGOLIAN HISTORY FROM THE VIEWPOINT OF INFORMATION HISTORY

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**Abstract:** *The topic of this article is a reinterpretation of the establishment of the Mongolian Empire from an information history point of view. At the beginning of the 13th century Genghis Khan united the nomadic Mongolian tribes and established the largest inland empire, never before seen in history. The borders of the new state reached from China in the East and the Carpathians in the West. Research over the past 200 years based the success of this vast empire on many reasons including the nomadic military organization as well as the favorable political situation of that time. In the following I will demonstrate the fact that the role of information and disinformation in this subject was utmost importance.*

**Keywords:** *military intelligence, diplomacy, Mongolian Empire, military technology, postal system,*

## I. INTRODUCTION

The notions of information and disinformation are very important in our daily life today. In the 21st century the flow of information is faster than it has been any time before. At the same time governments, companies, political parties make enormous efforts to preserve information from their opponents at all costs. In this competition of getting and saving information disinformation is also a major factor. This phenomenon wasn't different throughout history. From the beginning of time people tried to get as much information as they could about their surroundings, while disclosing as little as possible about themselves. Military activities apply the same tactics. Historians have proved the existence of intelligence services during the time of the states of the Ancient Near East (Dvornik, 1974). A discipline of information history researches the role of the flow of information during wars throughout the history of mankind. This article aims to examine this flow of information and disinformation during the period of the Mongolian conquest in the 13<sup>th</sup> century. In addition I will examine the bureaucratic institutions of the Mongolian Empire. The role of information and disinformation appears in

many different situations during the analysis of the Mongolian conquest. I have divided the presence of these phenomena into four categories: diplomatic relations, military intelligence, postal system, circulation of military technologies.

## II. DIPLOMATIC RELATIONS

We can handle the presence of information and disinformation in diplomatic relations and military activities in history as a part of intelligence history. The German historian Hansgerd Göckenjan (2001) published an article dealing with nomadic intelligence, answering some important questions and contributing greatly to this topic. Nevertheless the nomadic intelligence has remained poorly researched. This study brought attention to the importance of strategic intelligence in nomad warfare. Here I have to state that from this point on I will use the strategic and tactical categories as used in B. H. Liddell Hart's indispensable book *Strategy* (1991<sup>2</sup>). On one hand he claims that strategy is the segment in the art of war that minds war in general and the different operational theories and practices. On the other hand tactics is the segment in the art of war that deals with the leading of troops in different battle situations.

Before engaging in larger campaigns, the nomads always tried to gather as much information on the internal situations of opposing forces as it was possible. Accumulating this information was done by using different methods, which can be observed in the events I researched. Firstly I would like to detail the above mentioned diplomatic connections used in nomadic intelligence.

The account given by Friar Julian on his second journey to the east from the Hungarian Kingdom in 1237-38, quotes a letter sent by one of the Mongolian leaders to the Hungarian King, Béla IV. The messenger had been captured by the Suzdal prince before the letter reached the recipient. According to the letter, this envoy was the 30<sup>th</sup> sent to the Hungarian King, but the Khan had received no reply so far (Dörrie, 1956). We might consider that number of 30 legations is an exaggeration. But a letter from the French traveler Yvo de Narbonne proves the presence of Mongolian envoys in the Hungarian court. The letter states that the Dalmatian governor captured 8 Mongolians, one of which turned out to be of English origin. This person acted as an interpreter and envoy on behalf of the Mongolian Khan, who travelled twice to the court of King Béla IV (Gombos, 1937). On the basis of this information sole, we can state that the envoys of the Mongolian Empire were well prepared and spoke many different languages. The account of Friar Julian's first journey (1235-36) supports this fact as well, which tells us about his meeting with a Mongo-

lian envoy in the course of the Eastern Hungarians. According to the description, the envoy spoke Russian, Cuman, German, Persian and Mongolian (Gombos, 1938). The movement of these envoys in the Mongolian Empire was brought to perfection in a way which had never been seen before in nomadic states. Using a method practiced by Persians and Arabs, postal stations (called *jam*) were built throughout the Empire. Below I will give further information on this subject. The Mongolians not only sent but also received many envoys. In the account of Polonus regarding his travel in the court of Güyük Khan, he writes of 3000 envoys from different countries being present at the election ceremony of the Khan (Dawson, 1955). Meanwhile we can notice that in the accounts of monks travelling to the East, only a few pieces of information could be gathered regarding the Mongolian military organization. The main reason for this was that after entering the Empire, the monks were guarded by Mongolian escorts. This implies that although many envoys travelled throughout the Empire, they were successfully hindered from acquiring accurate information regarding Mongolian military. I believe this to be an early version of counter intelligence and disinformation.

### III. MILITARY INTELLIGENCE

The military intelligence can be also divided in to two parts: strategic and tactical intelligence. We can find perfect examples for both in the military history of the Mongols. Strategic military intelligence has two major parts as well: one is the above discussed diplomacy, the other are the preliminary campaigns. The goal of these campaigns was not to occupy a territory. During these expeditions the Mongols aimed to gather as many information about an unknown region as they could. In connection with the preliminary or investigative campaigns, we may say that the first Mongolian expedition to the West which started in the autumn of 1219 and ended in 1224 where the ending point was the Russian steppe, is regarded by scholars as a campaign to acquire knowledge of the area in preparation of a large scale attack. A large part of the territory was not occupied by military troops, although the whole area was investigated by them. We may regard this action as a success, since the scattered scout groups travelled the Western territories of the steppe, gathering firsthand information on Middle and Eastern Europe.

The other important part of military intelligence is the tactical intelligence. The main goal of these military activities was to serve the campaign's success with information. Fortunately in our sources many precedents of this activity can be found. During the actual large scale attack a method used in acquiring tactical information, was incorporating leaders with a wide knowledge of the terrain. In the case of the Mongolian conquests in Europe, among the works of Jan Długosz, there is a source which suspects Rus captives in Poland, leading the Mongolian troops.

The troops functioning as scout groups were called *manglai*, which means forehead (Rachewiltz, 2004). Even Friar Giovanni DiPlano Carpini mentions that the scout groups march ahead of the army. He says: "*When they are going to make war, they send ahead an advance guard and these carry nothing with them but their tents, horses and arms. They seize no plunder, burn no houses and slaughter no animals ; they only wound and kill men or, if they can do nothing else, put them to flight. They much prefer, however, to kill than to put to flight. The army follows after them, taking everything they come across, and they take prisoner or kill any inhabitants who are to be found. Not content with this, the chiefs of the army next send plunderers in all directions to find men and animals, and they are most ingenious at searching them out.*" (Dawson, 1955)

We can find more precise information in the reports on Mongolians, which can be connected to the Southern Chinese Song dynasty. This source writes that the primary assignment of the scout troops was to settle on the hills and higher terrain that fell in the path of their armies, as well as to capture enemy prisoners. The source also lists the questions with which the troops interrogated their prisoners (Meng-Ta-Hei-Ta, 1980).

In the book entitled *The Secret History of the Mongols* – which is the oldest surviving Mongolian literary work -, we can find several references that the scout groups set up camps at certain distances and sent even more troops forward from these points: "*Činggis Qa'an sent Altan, Qučar, and Dāritai, as a vanguard; the Ong Qan sent Senggüm, Jaqa Gambu, and Bilge Beki. Patrols were also dispatched ahead of these vanguards: at Enegen Güiletü they set up an observation post; beyond that, at Mount Čekčer, they set up another observation post; and beyond that, at Mount Čiqurqu, they set up a further observation post. Altan, Qučar, Senggüm and the others of our vanguard arrived at Utkiya. While they were deciding whether to camp there, a man from the observation post wick had been set up at Čiqurqu came riding in haste and brought the news that the enemy was approaching.*" (Rachewiltz, 2004)

Based on this data we can say that the Mongol troops were able to do long-range, efficient exploration on the enemy's territory. The description of these camps can also be found in the reports already mentioned. On the basis of this we know that the horses were both tended to and fed inside of these camps while in normal camps they were kept outside. With this method the Mongol scouts could prove their quick response ability. Another interesting piece of information is that the cooking was done before sunset, and the fires were left burning at night while they moved to a different location to mislead and misinform the enemy.

Overall it can be said that the well-organized military intelligence (strategic as well as tactical) was a very important part of the Mongol warfare.

#### IV. POSTAL SYSTEM

The Mongol postal relay system is very well known from Marco Polo's report. The Mongol postal system was established during the reign of Ögödei (1229-1241), the third son of Genghis Khan. This network of post stations (*jam*) was known much earlier in Inner Asia and was used before the Mongols had even established their empire. The vast size of this network was far more extraordinary than any postal system used before (Allsen, 2009). In the 13<sup>th</sup> century the extent of this network covered almost the whole empire starting from Central Mongolia to China in the East and reached the lower Volga in the West. The aim of this huge and sophisticated system was to help the flow of information and goods throughout the empire. There were three types of postal stations: *morin* or 'horse' stations for moving people, messengers, and officials; *narin* or 'careful [-handling]' stations to enable the direct communication with the great khan; and *tergen* or 'wagon' stations used for the transportation of goods. The *jam* was maintained by the Mongol military establishment, although the provision of horses and supplies was the responsibility of the local population. The supplies were given by the locals as a tax to maintain these stations. At every relay station horses and other necessary supplies could be found. Messengers could change their horses at these stations, and by so doing did not have to stop to rest. Important messages could be carried at an accelerated rate. Marco Polo who travelled around China during the Mongol rule says: „*Thus it is so expeditiously conveyed from station to station, that in the course of two days and two nights his Majesty receives distant intelligence that in the ordinary mode could not be obtained in less than ten days.*” (Polo, 1958)

Even though it may sound like an exaggeration, we can say at that time this was the fastest way of transmitting information. To be able to use the services of these postal relay stations the travelers had to have a *paiza*, which was a Mongol office emblem that served as a passport throughout the empire.

In general we can say the Mongols built up a postal relay system that had been known before, but they developed immensely. This network was the largest, most sophisticated and fastest at that time. It can't be overemphasized that this system and the speed of the information relayed by it, was a huge advantage for the empire against their enemies. As I stated before, the foreign envoys and their Mongol escorts used this system as well. In this way this system also prevented the intelligence activities of other states against the Mongolian Empire. The accurate and fast information flow was one of the Mongol's biggest advantages against their enemies.

#### V. MILITARY TECHNOLOGY

At the beginning of the 13<sup>th</sup> century the Mongolian army was equipped with almost the same types of weap-

ons as their nomadic predecessors since the first centuries A.D. As they conquered lands beyond the steppe zone they met with new military technologies. The main difference between them and their predecessors was that they started to use these developments and incorporate them into their warfare. The research of this subject today is well processed, especially in the works of Thomas T. Allsen. In the following I want to summarize his results.

The Mongols interacted with many sedentary people from the Chinese to the people of the Muslim states of Middle- and Western-Asia till the Eastern-European countries. The armies of these states had their own style and equipment's of warfare. One of the secrets of the Mongol successes was that they could incorporate these equipment's and apply them to their own style of warfare. The biggest innovation of the Mongols was that they did not just incorporate the military techniques, but they captured the enemy technicians. The Mongols regularly moved craftsmen from the occupied lands to the center of their empire (Allsen, 2009). After so doing, these professionals commenced working for the good of the Mongolian Empire. During the campaigns against North China the Mongols sent commissioners (*shizhe*) into the cities to bring out scholars, artisans and technicians before raiding them. We know from the Chinese sources that the population registers of the Mongols contained separate categories for military, merchant, agricultural and artisan households. With this practice within only a few decades the Mongol rulers created a huge data base that contained a great deal of information about the useful talents in the empire (Allsen, 2009). Allsen state that there existed different types of data bases like maps of strategical points and postal relay systems (Allsen, 2001).

Over all we can say that the Mongols had a systematic practice to incorporate military technology and technicians. With this method they could improve the effectiveness of their army. Moreover we have to say that this practice was not only for military technologies and professionals. Recent researches on this subject clearly proved the fact, Mongols incorporated technologies and experts from many disciplines: for example their taxation system, the state bureaucratic practices, religions, etc.

#### VI. CONCLUSION

In this article I introduced a new aspect of analysis of the establishment of the Mongolian Empire. The exploration of this subject with the aspect of information history presented the fact that the fast flow of information and the well-used disinformation were very important factors in the successful conquests of the Mongols. The well trained diplomats could gather much information from other countries while foreign envoys were prevented from it. The military intelligence was also well organized, and worked effectively in both tactical and strategic dimensions. The subjects of the postal relay

system and the military technologies show us a special talent of the Mongols. They not only incorporated and used new technologies and systems, but they also developed and applied them to their attributes. As we can see the threads of information met at the center of the empire. The well-organized information relay system and the data bases helped the great Khans to make the most effective decisions.

In this paper I emphasized those aspects of information and disinformation that were controlled by the state. Another very interesting subject could be those aspects what were not under the control of the state. For example the religious and all the cultural interactions in Eurasia, initiated by the Mongols in the 13<sup>th</sup> century and after.

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# Early warning systems and the Hospitallers in the eastern Mediterranean

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**Abstract:** Having briefly surveyed the history of the Hospitallers as well as the political situation in the Aegean, the present paper attempts to trace the establishment and the functioning of the early warning system of the Knights of St. John built up on the islands of the Dodecanese from the early fourteenth up to the beginning of the sixteenth century.

**Keywords:** Hospitallers, naval warfare, warning systems, fire and smoke signals, middle ages

**DOI:** It would be provided by publication house

## I. THE KNIGHTS OF CHRIST

It is worth outlining the history of the Hospitallers since there are numerous misunderstandings concerning their function and activity. The fundaments of the Order of St. John of Jerusalem was established well before the success of the First Crusade (1099). The Jerusalem hospice was originally founded by southern Italian merchants and the house functioned as an outpost for Amalfitans stationing in the Holy Land. Soon after the Christian capture of Jerusalem the religious community of the hospice received papal recognition (1113) and performed a strictly charitable activity. The militarization of the Hospital has been developed by the 1160s (Burgtorf 2008) and from this time onwards the double function earmarked the activity of the brethren of this military-religious order well until modern times.

The Hospitallers supported the crusading activity in the Latin East from the revenues of landed estates they received as donations from European fellow Christians. The military-religious orders introduced a new and highly centralized administrative system: its basic unit was the preceptory or commandery while the Order was headed by the (Grand) Master, by his major officers and by the Chapter General which met in three–five years intervals. The preceptories were grouped by priories while the latter were organized into Langues (*linguae*) supervised by the leadership of the Order. The Master and the Chapter General levied annual tax (*responsio*) on the preceptories, theoretically 1/3 of their net income which have been transferred to the center (*conventus*) of the Order. (Sire 1994)

The financial support, the man-power of the knightly brethren together with their sergeants, as well as other supplies provided by the Hospitallers helped the Christian forces in their mainland operations against the infidel in the Holy Land until 1291. After the Fall of Acre, the last Latin mainland stronghold, the Hospitallers moved their headquarter first to Cyprus but by 1309/10

they occupied the island of Rhodes – with some Genoese backing – and the knights stayed for more than two centuries. Rhodes became neither a colony of the European priories of the Order, nor it functioned as the *Ordensstaat* of the Teutonic Knights. The island was lost to the Ottoman 1522 and after some years of planning the Order received the Malta from Emperor Charles V in 1530 which island they managed to hold until 1798.

## II. THE AEGEAN: Crusaders, merchants, pilgrims



Figure 1. The Aegean and the Dodecanese

The new headquarter at Rhodes and the settlement on the islands of the Dodecanese, augmented with the rearrangement of European crusading plans remarkably altered the role and function of the Order. First of all, the charitable and caring activity has been virtually reduced in their preceptories and hospices. On the other hand, the sea-based center initiated the increase of the naval activity of the Hospitallers which proved to be a proper reaction upon the challenge caused by the changing political situation in the Aegean.



Figure 2. Hospitaller presence in the Dodecanese



The establishment of their navy during the first third of the fourteenth century was fully in accordance with of the needs of the region. The naval *status quo* maintained by the Venetians, the Genoese and ghazi emirates of Asia Minor seemed to be increasingly disturbed by a raising new power, the Ottoman Turks. (Bosworth 1996) Due to bilateral agreements or tax-paying, even after the loss of the major part of the Levant both merchants and pilgrims visited the Holy Land, Egypt and some of the Mediterranean islands. Besides the raising Turkish menace, pirates (e.g., Catalans, other Latins or Muslims) caused bitter experience of peaceful travellers of vessels. These pirates often landed on smaller islands and raided the goods either of the local Greek population or Latin *casalia*. In order to cure or counterbalance these problems, both Christians and Muslims frequently sailed in convoys towards their targets. Moreover, captains of ships or those in charge of the cargo employed “patrol service”, for instance, provided by the Knights of St. John. There are legendary images of the medieval Hospitaller navy or fleets but in reality it never was large or comparable to, for example, the later developed Ottoman fleets. The members of the Order were expected to serve in the Hospitaller navy, called the *caravan* which usually consisted of four–eight galleys and was led by admiral of the order from 1291 the latest.

The patrol activity of the Hospitallers proved to be so successful as to induce the Order to institutionalize this service. The knights acquired papal license to confiscate not only the cargo of Muslim ships but also any of those carried by Christian galleys, cogs, carracks when they suspected that the goods found have been obtained through trade with the infidel. (Riley-Smith 1999) This activity (known as *corso*) of the Hospitaller fleet from the beginning of the fifteenth century defamed the knights of Christ in the eyes of their fellow Christians as they regarded it “licensed” piracy (Luttrell 1995); especially it led continuous tension with the Italian maritime communes. By the beginning of the sixteenth century, almost the half of the annual income of the Order originated from its corsair activity. *Horribile dictu*, they continued the *corso* from Malta (where shortage of sweet water often caused difficulties) and sources made mention such abuses as the confiscation of water supplies of sailing Christians. (Sire 1994)

These measures, however, helped little the Order to defend its own outposts or lands in the Dodecanese. This sort of patrol service was inadequate to control the islands or the coastal lines, particularly Smyrna (1344–1402) or following its fall, Bodrum (Turkey), off Cos, on the Anatolian mainland. Aiming at the establishment of an effective defensive system, the Hospitallers built up an early warning system augmented with other means of communication from the first third of the fourteenth century onwards.

### III. WARNING AND LONG-DISTANCE COMMUNICATION SYSTEMS

Many of the warning and long-distance communication systems are surprisingly old techniques,; at least their ideas born relatively early as far as either written history or material culture can attest. Already the books of the Bible contain clear references to the existence of such systems (Exod 13:21, Deut 1:33, Judges 20:38) but there are also traces from the eighteenth century BC (Dossin 1938), the twelfth century BC (Edwards 1989) or from the sixth century BC (Borowski 1988). More recent and thorough survey (Woolliscroft 2001) revealed how the Roman military signaling functioned (intervisible line of watch-towers, flare signaling, sema-phores, heliographs, home pigeons). The author of the study, however, drew attention to the fact that mere references in the Classical literature do not necessarily prove the very existence of these means of communication or the very functioning of the technology remained somewhat obscure. For instance, the well-known code-system of the Polybian tables which was hardly widespread among contemporary strategists, or the famous beacon chain of Agamemnon, since his sight-line contains an interval of c. 170 km which seems unreliable regarding intervisibility. As for the latter, there is no satisfactory scholarly agreement. All that can be stated that intervisibility depends on geographical, climatical, weather- or day/night conditions. Modern experiments (Wooliscroft 2001) seem to provide more reliable data but we always have to bear in mind that, for instance, medieval mirrors were far less effective than modern ones. In addition, climatologists noted that the climate of fourteenth-century Europe – including the Mediterranean – was significantly colder which, most likely, ensured longer distance of visibility. Despite hard climatical or weather conditions beacons were used as early warning system in the foggy Albion well until the eighteenth century and sources prove that intervisibility reached 30 miles even in case of foggy or rainy weather.

Unsettled disputes earmark the question of the planning of such systems. Lacking informative sources, however, researchers often guess whether a certain system, either along the Roman limes (Woolliscroft 2001) or the Byzantine line leading from Asia Minor to Tarsus through deserts or forests (Pattenden 1983, Rife 2008) were prearranged or rather the presence of already existing posts reached a “critical mass” which induced rulers to link distant points.

### IV. THE HOSPITALLLERS’ EARLY WARNING AND LONG-DISTANCE COMMUNICATION SYSTEMS

In the case of the Hospitalllers it is very clear that the defence of their people and properties forced them to create a warning system either against pirates or raiding Mameluks or Turks who at times not only sacked but also temporarily occupied the smaller islands of the

Order. Most of these islands or islets had smaller or larger fortified sites either of Hellenic or Byzantine origin. The knights, after having acquired the islands and parts of the coast-lines, established their own outposts (castles, watchtowers [viglas], preceptories, churches, agricultural building-complexes, etc.) utilizing these already existing entities (at times by further fortifying these but rarely they only utilized the building materials at a new site). Nonetheless, these sites or *casalia* were controlled by only a few members of the Order, the far majority of the population of these islands was Greek (Luttrell 1989). These fortified sites provided shelters for the locals in case of attacks against their island and thus it was not only their duty but also their self-interest to maintain or rebuild these buildings.

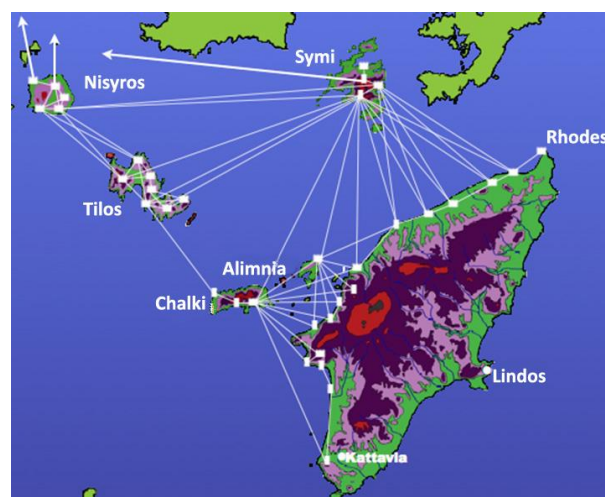
Island	castles	watchtowers	fortified sites
Castellorizzo	1	1	?
Rhodes	+20	9?	+
Chalki	1	2	
Alimnia	1		
Symi	1	4	?
Tilos	3	4	?
Nisyros	4	?	
Kos	8	8	3
Pserimos		1	
Kalymnos	4	5	3
Mount Rakhi	1		
Leros	4	3	3?

**Table 1.** Hospitaller castles, watchtowers, fortified sites

The first mention of the existence of the Hospitaller warning system established on the above mentioned sites is to be found in the description of a mid-fourteenth-century traveler, Ludolph von Südheim (Ludolphus 1851) who reported the signal system of the Order. The medieval author noted that at daylight the brethren used smoke at daylight and fire signals by night between the islands of Castellorizzo, Rhodes and Cos. He also emphasized that the proper signaling was the duty of the brethren. Modern readers of Ludolph's report, however raised questions concerning the credibility of his information. The minor problem concerns the weather conditions. Either humidity or wind would heavily encumbered the transmission of the signals from one point to another. What is more problematic is the distance between Castellorizzo and Rhodes, especially as there are no medial islands around. Since there is otherwise no ground to doubt the traveller's report, we may suppose that the knights used the Anatolian coastal line to bridge the relatively huge gap.

Much more can be reconstructed concerning the fifteenth and early sixteenth century as far as the warning system is concerned. Recent scholarship – historians,

archeologist and geographic surveyors (Spiteri 2001, Triposkouf – Tsistouri 2002, Zafirios – Brokou 2002, Heslop 2008, Heslop 2011, Luttrell 2011) – attempted to identify the function of the strongholds on the Hospitaller islands and they managed to reconstruct the theoretical network/matrix of sight-lines. Lacking fully convincing pieces of evidence, while proving the very function of each sites (castles, watchtowers, viglas, etc.) one should be very careful with such reconstructions. There are, however some extant documents which may shed some light on the fifteenth century situation.



**Figure 2.** Example of sight-lines between the islands (Heslop 2011)

The first three decades were relatively peaceful but by this time the Mameluks lost their patience towards the Hospitaller port of Rhodes which let pirates, on a regular basis, to anchor and station, those pirates who often raided Mameluk ships. The interest of the knight was to gain information through an *ad hoc* system of intelligence. The Mameluks arranged an attack against Rhodes and first they occupied Castellorizzo in order to cut the warning lines. Finally, they failed to cause major blow on Rhodes but they managed to hold Castellorizzo from 1443 until 1450 (Williams 2005) thus the island could not send signals in the course of the second Mameluk attack in 1444.

Having experienced the importance of the early warnings, the Order made measures about the functioning of the system in 1449 (NLM Arch. 361). The leadership of the Order threatened those brethren who neglect the signaling with public humiliation (Heslop 2008). These provisions proved particularly important with regard to the approach of the new enemy, the Ottomans. The Turks regularly tested the Hospitaller warning system from the 1470s (Luttrell 2011). However, during the first major Ottoman siege of Rhodes (1480) their fleets failed to identify the geographical importance of Alimnia and the defenders were informed in time about the approaching Turkish fleet. But four decades later, the attackers of the second and conclusive siege of Rhodes (1522) were more prudent than their predecessors and first they tried to blank off the Hospitallers' warning system. Certainly, there were many

other, more serious reasons which led to the surrender of the knights by New Year eve. Soon after the fall of Rhodes, the knights abandoned the islands they still controlled thus their warning system collapsed. There remained nothing to defend.

## V. CONCLUSIONS

On Byzantine premises, the Hospitallers established an early warning system to defend their people and properties from pirates, Mameluks and the Ottoman Turks on the islands of the Dodecanese by the first third of the fourteenth century. Despite the scattered nature of the sources at our disposal, it can be assumed that the system functioned successfully until the beginning of the sixteenth century. The losses of the knights against the Ottoman navy had little to do with the efficiency of their warning system.

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# Information Management as Establishment Dutch Navigational Knowledge on Japan, 1608-1641

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**Abstract:** *I examine some topics concerning knowledge management through the activities of the factory of the Dutch East India Company in Japan. I use Dutch archival materials to show the movement from the tacit dimension of knowledge to concrete, written forms. I focus not only on the collection of data, but also on the methods of dissemination and usage of the collected information, and the connection between these dimension and the organizational structure of the Company.*

**Keywords:** *Dutch East India Company, early modern history, information history, information management, maps.*

**DOI:** It would be provided by publication house

## I. INTRODUCTION

The Dutch East India Company (VOC) was a new actor in Asia at the beginning of the 17th century, and this fact left its mark on its stock of available knowledge. However, the 1620s and the 1630s brought significant transformation of Dutch navigational knowledge. The European side of management of Dutch navigational knowledge touching Asia in the 17–18th century (that is the activities of the Hydrographic Office of the VOC) is well known from the thorough study of Günter Schilder (1976). Kees Zandvliet (2002) provides a similarly exciting review of the activities of Asian hubs of the VOC. His text, besides allowing insight into the work of the cartographic workshop in the primary Dutch base, Batavia, details the role of a mid-level centre, Taiwan, too, in completing such tasks. At the same time much less data is available on the bottom levels. My paper intends to improve the situation in this respect and as such it is basically a case study. My main emphasis is on the role of a unit at the lower part of the organizational hierarchy in handling navigational information: I examine what part the VOC-factory in Japan played in a special segment of the information management of the Company.

## II. METHODS

### A. Primary Aims

Work in factories and on ships included different information-related activities, therefore the simultaneous examination of these two spheres can shed light on both general topics – such as the various sides of information handling – and on such concrete and individual historical details that have not received enough attention. On the one side, I implement a problem-centred approach. This provides wonderful opportunity to detail some “timeless” problems (and especially their manifesta-

tions) that appeared in most historical eras. I will examine such topics like the expansion of the pool of information available to actors (mainly its coordination) or the multiplication, dissemination and sharing of information collected and “shaped into proper form”. The events, for example, show perfectly how different stations of the knowledge handling process were based on each other: starting with a problem and the birth of an idea, through the collection of data, up to dissemination of acquired information in the system. Such examination may show how these issues took shape in the early modern era, how they were answered, and may even serve as raw material for a broader research on the history of information-related phenomena.

At the same time, I try to give better insight into some minute details of the information system of the VOC. The profound examination of the Japan factory helps with this, since it reveals additional tiny particulars of Dutch presence in Asia. A description of the Japanese situation highlights how specific the Dutch information-system could be in different regions and allows some comparisons. For instance, Zandvliet (1998) applied a well-structured model on Dutch cartographic activities on Taiwan. However, the chronological stages described in his paper were based largely on Dutch military power exercised there. The situation was fundamentally different in Japan. The Dutch had no similar power in Japan at all, and this characteristic made a fundamental impact on specifics related to navigational and cartographic knowledge, too. To sum it up: my other aim is to present one – slightly special – of the many faces of the information-system of the Dutch Company. This can be all the more important, because such an analysis allows highlighting and emphasising many not trade-related activities in this Dutch factory, too.

Last, one terminological issue should be mentioned. I try to focus not only on cartographic knowledge (though probably this is the most concrete and obvious portion of the stock of knowledge in question), but on a slightly different category: navigational knowledge. I lay bigger emphasis especially on the unwritten – accordingly, in the sources often invisible – dimension. Within this, I will try mainly to grab the role of “experience”, which – despite of the constant expansion of cartographic knowledge – had paramount importance even on ships of the mid-17th century.

### B. Available Sources

Making up an idea of the role played by the Japan factory in its first one and a half decades concerning carto-

graphic and navigational matters, due to lack of primary sources, is a difficult task. The majority of the Dutch correspondence is still available in the archives, but before 1625 it has very big gaps, and there are hardly any available sources for the years before 1623. The majority of the letters that can be consulted today was written after that year. Between 1629 and 1633 there was another nadir, but this was the result of a temporary deterioration of Dutch–Japanese relations (the so called *Nuyts-affair*, a serious clash with Japanese authorities). However, after this period a huge corpus of sources – supported even by Dagregisters held in Japan (1974), Taiwan and Batavia – is available. Accordingly, I can present a more detailed picture on the 1630s.

### III. JAPAN IN THE VOC SYSTEM

The establishment of the VOC-factory, seated in *Hirado*, South Kyushu, in 1609 should be viewed in a given geopolitical constellation. It was not only a commercial centre: the Dutch used it mainly as a base in their war against Portugal and Spain. Logistic tasks of the factory were as important as commercial or economic ones. Japan played a role as a centre providing support for ships operating in the South China Sea region, and the Dutch exported much provision and war materials from the country. Exporting foodstuff from Japan and founding guns and metal accessories of ships played significant role in the wars of the Dutch. At the same time, the country was used as a base for military (often privateering) operations. It played an equally important role in careening ships, and only the *Nuyts-affair* altered this.

Things started to change in the 1620s. The factory in Hirado slowly transformed into a fundamental element of the Dutch – especially intra-Asian – commercial system. First, Japan was less and less able to fulfil its mentioned role as a naval base. The shogun in 1620 prohibited the export of weapons and Japanese persons, which was a severe blow to this role. Careening ships was no more possible in Japan around the end of the 1620s, and was held no more economical in the 1630s. On the other hand the factory became more and more important economically. By 1633, Taiwan evolved into a very important commercial centre, so the volume and profitability of Dutch traffic from Taiwan to Japan increased firmly. The other primary partner region was Batavia, which played crucial role as the headquarters of the VOC-system in Asia. Wares from Europe and other parts of Asia reached Japan usually through this town.

### IV. DUTCH CHARTING ACTIVITIES IN JAPAN

#### A. A Problem to be Solved

Emphasising that “experience”, unwritten knowledge was very crucial in the second half of the 1620s seems to be a good starting point. Sources before 1625 contain only few mentions on maps of Japan, though this of course does not mean that maps or navigational aids were completely missing. This relative absence of references rather suggests that – in this period at least – only few difficulties or questions to be solved arose concern-

ing such written aids. There are many more references to experience-related issues. The phrase “experienced pilot” appears many times, usually in a context describing how desperately such experts were needed. If we try to specify the underlying meaning of the term, it seems probable that the authors of these letters comprehended “experience” as tangible knowledge relating to a more or less definable region and to specific details of the area in question. That is, experience meant acquaintance with concrete situations and issues “around here”, in a given territory.

The question of experience, however, most often appears in a different way: through references to inexperience (that is lack of experience) and difficulties resulting from that want. The need for experienced specialists in Japan became more and more imperative, especially after the middle of the 1620s. While in the first decade of the factory there were even such years when no ship arrived at Japan at all, in the middle of the 1630s usually 7-8 Dutch ships visited Japan in a year, and in the end of the decade this number stayed steadily above ten. This was of course happy news from the viewpoint of trade, but these ships had to be manned with experts having the necessary knowledge (that is of Japanese waters) to conduct these voyages. This did not go smoothly at all. Another – Japan-specific – factor made the situation especially serious. An edict of the shogun prohibited local barks to meet Dutch ships arriving at Japanese coasts. The order may have caused serious confusion above all because Dutch ships seem to have used local experts extensively as guides. Open water navigation was more or less a routine and was supported by charts and rutters as well, attention especially was required when ships reached their target region. The exact locations of the places sought or safe havens had to be found on the – not necessary familiar – coastline; possibly dangerous parts or currents had to be avoided, and so on. If the pilot of a ship had not ever visited Japan and was not acquainted with the region, the result could easily be a series of “inconveniences”.

We find many references on difficulties originating from lack of proper navigational knowledge. Sometimes even reaching Hirado could be a serious challenge. In 1634, for instance, the navigators of the *Venloo* and the *Schaagen*, who had not been to Japan earlier, thought they were in Hirado – though they reached only the coasts of Satsuma, which is quite far from the town. After reaching Hirado calling at port still could be a challenge. Not only an underwater reef made this task difficult, but a strong current in the bay, too. They got a ship into a serious jeopardy in 1627, which grounded on some clips of rock. The writer of the letter describing the incident held it important to highlight that neither the commander of the ship nor the navigator had visited Japan earlier, thus they did not know the place.

#### B. Possible Answers

So, dangerous emergencies originating from lack of experience were not at all rare even in the 1630s, de-

spite of the fact that the Dutch factory had a past of a quarter of a century by then. Dutch decision-makers noticed these problems. They could consider many ways to improve the situation. “Teaching” specialists and endowing them with the necessary knowledge presented itself as an obvious solution. Considering the nature of the task, this could happen mainly through practice. For example, in 1625 the cape merchant sent an “experienced” pilot to Taiwan on board of a Japanese ship. The cape merchant charged the pilot with taking good notice on every detail, and after reaching Taiwan he had to give an account to the Governor there. This kind of learning, however, was not a consistent strategy. “Lending” pilots does not seem a completely unique practice in these early years, but such situations more often were taken as inconveniences, so had to be avoided. The situation could be improved (instead of getting more information) with bettering the distribution of available knowledge, too. In practice it meant that specialists with necessary expertise were stationed in primary centres, visited ships in distress if necessity required, and guided them to safety. On Taiwan sending out ships to meet those that just were arriving from Batavia or Japan was a regular practice. The Hirado factory, too, got such experts in the 1630s. The two most famous were Frans Visscher and Matthijs Quast. Nevertheless, none of them were especially sent to Japan to solve such situations, but had different assignments.

These methods, however, were not perfect, and could not be used for a longer term. Teaching specialists through sending them on voyages required very much time and resources; moving experts was slow, and there were never enough of them around. Finally, the most perfect solution was “untying” knowledge from individuals, and making it accessible on material carriers.

Demands on new maps appear in the second half of the 1620s first. The head of the Hirado factory highlighted the problem detailed above first in 1627. The letter contains several interesting details. The mentioned edict of the shogun, which prohibited local barks to meet arriving Dutch ships, explains the exact timing of raising the problem. The Dutch practice of relying on local people – an effective method at first sight – gives a reason why the Dutch had not made any effort at all to reconnoitre the coasts of Kyushu and why such an expedition had not even been suggested at all. Besides, it accounts for the detail why the Japan factory advised the project. The merchant – as a reaction to the new situation – suggested sending a navigator to Japan to survey the broader neighbourhood of Hirado (concretely the regions of the Goto Islands, Arima and Satsuma). He argued that the project did not involve heavy expenses, since only one person had to be sent over. This supports again the idea that the ignorance of making detailed charts was not due to financial reasons. However, the proposal – mainly as a consequence of the Japanese-Dutch conflict developing at the end of the decade – was dropped, and even a letter sent in 1634 from Batavia refers to the region in question as unknown.

Similar plans appeared again in 1633, but this time different demand was in the background, so a different place had to be examined. In earlier years moving the factory from Hirado had come up several times. This time a special *Ki no Kuni*, in the vicinity of Osaka was brought up. Drawing a map on the place was not touched upon, the documents prescribed only “discovery”. Parallel with this, the former project of the collection of navigation-related data and the reconnaissance of the seas around Japan was not mentioned at all. Examination of the site finally took place in the beginning of 1634, but the Dutch – probably due to lack of shipping experts – could not establish if the harbour was suitable for bigger vessels or only for barks. Thus, satisfactory closure of the case was delayed. Meanwhile charting the region of Goto and Arima became timely again. The merchants had to choose between the simultaneous projects. The council in August judged the discovery of *Ki no Kuni* secondary, and finally in the autumn of 1634 totally abandoned the idea.

The background of the new plans to map seas around South Kyushu was still the same: dangers originating from lack of knowledge of navigators of ships arriving in Japan. The question was brought forth again only in 1634. A pilot set off in June to collect data on the waters near the Goto Islands and to make a map of the region. However, the expedition had to turn back after few weeks since the regents there, after getting acquainted with the purpose of the Dutch ship, commanded her to leave forthwith. The Dutch reluctantly returned to Hirado. Not long after this failure, following the urge from Batavia, another try was decided on. The Dutch acquired an even stronger letter of recommendation from the lord of Hirado. Nevertheless, all this was in vain. The point of view of the regents of Goto did not change at all. Some places, regardless of the rejection, were charted, so the enterprise was not a total failure. However, surveys around Goto came to an end.

The voyages of discovery continued, but new places were put in focus. In 1635 two Dutchmen mapped the territories and islands north of Hirado. In 1636 steps were taken to find another port instead of Hirado. A bay not far was surveyed: experts finally visited it, drew a large-scale map of it, “took its depth at every point”, but the results showed that transferring the factory to this new port would not have been an especially advantageous move. This was the last Dutch expedition in the period examined. The pilots who played crucial role in gathering the data soon left Japan. Collecting data however was only the first step of solving the problem.

#### **D. Multiplication and Dissemination**

The first mention on the “new map of the coasts of Japan” appeared in a very short time after the mentioned expeditions. A letter sent to Europe in early 1635 had the map of Goto attached. In the same year, this new map of Goto found its way back to Japan. It was even used during the voyage. After this, maps on South Kyushu regularly appear in documents. So, in the second



half of the 1630s not only mapping expeditions were abundant in Japan, but – based on the information gathered – many maps were drawn also, especially on the regions that were crucial for safe coming and going of ships. However, one additional task still had to be done. The charts had to be present on all ships visiting Japan.

First of course, a number of maps had to be created through copying the original one. It is interesting that making copies did not take place necessarily in the cartographic workshop (in Batavia) and was not done by all means by professional “chart-makers”. The Japan factory played significant role in copying maps, though this time not merchants, but officers of ships had tasks to do. In directions given to ships moving from Taiwan to Japan duplicating maps (of both Japan and Taiwan) – according one order in 3-4 pieces – appear, that this activity was widespread in the second half of the 30s in the factory. They provide interesting contribution concerning division of labour also. Maps were made in Batavia, but the much more mechanical duplicating works were assigned to lower levels of the hierarchy. The Taiwan Centre often sent all copies of a specific map to Japan, and kept none by itself. Copies had to be made after the original one. After that all copies were to be distributed among ships, and the source map had to be sent back to Taiwan.

Dissemination of maps appears first in 1634, too, supposedly because the first new maps to be distributed were made then. Here some notes on the usage of maps are in order. Some ships reached Japan directly from Bantam, but many more arrived from or via Taiwan. Consequently, maps depicting coastlines and seas around China and Taiwan popped up in the factory as often as those of the South Japanese islands. The direction of movement of ships was a very important factor in the process of distribution. Maps of the destination areas were especially important, and navigators were provided with these immediately before setting off to the trip. Pilots, however, were allowed to keep these maps by themselves until they needed them – that is the termination of the voyage in question. The distributive actions at the Japan factory aligned to this structure.

The practice of moving maps around was fixed in the middle of the 1630s. The first mention of maps of Goto, Hirado and the Japanese waters given to navigators is from 1635. Navigators received these maps in Taiwan, and – since seemingly they were not needed any more after successful arrival – had to hand down them in Japan. After that, merchants sent those maps back to Taiwan, in order to provide next year’s ships with them. At the same time, several maps of the China coast travelled on the ships heading for Japan, too, but they were handled separately. The cape merchant had to have made copies of them and then he had to distribute the new maps among ships heading for Taiwan. Moreover, according to indications, navigators had only the maps of their destinations with them. All other charts which apparently were not used on the voyages – travelled in the batch of the general documents (letters, ac-

counts etc.), usually in the custody of a merchant. The fact that the orders given to the cape merchant at Hirado always detailed and emphasised collection of maps of Japan, while concerning Chinese maps no such directions can be found, hints again that latter ones were not with the navigators.

## V. CONCLUSION

The events I described are the in connection with a transformation of the VOC in the 1630s. This was not confined to cartographic issues; a background structural change is highly probable. Access to goods was one thing, but a solid information background was necessary to be competitive, too – and this was built and enhanced in the 1630s. Thanks to these changes, movements of ships became more predictable and the details of the system could be more accurately forecast. The mentioned change of handling and acquiring of navigational knowledge fits in this picture perfectly. Van Dyke’s (1997) example for this is bookkeeping, but several other, at first glance not necessarily related aspect of this change can be traced. The transformation of the mapmaking practices of the Company I detailed in this paper is one of them. It was not only – and maybe not even primarily – a question of quantity. The first maps created in Asia can be dated to the early 1620s and showed mainly zones of military importance. The situation, as the case of Japan shows, changed dramatically in the next decade. Several other – less striking – indicators and aspects of this change can also be highlighted. One is the movement from tacit knowledge towards the use of more objective, more material, more exterior “containers”. And if we focus on an even more general level, especial emphasis was put on *systematic* collection of data, which seems to indicate an altered mentality. That is, the topic of this paper should be handled not as a separate phenomenon, should not be treated in itself but as a part of a bigger transformation, as the rearrangement of the information patterns – and within this: the infrastructure – of the VOC.

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# A deluge of files - register and training of men for military and civil purpose in Prussia in the early 18th century

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**Abstract:** *The first steps of the modern bureaucratic state provide numerous interesting features for information management researchers. The original function and the first steps in the creation of databases can be perceived through historical observations. Furthermore, Prussian history provides a better insight into how being registered by the central authorities could have an impact upon peoples' lives.*

**Keywords:** information history, information integration, early bureaucracy, Prussia, absolutism.

**DOI:** It would be provided by publication house

## I. THE PRUSSIAN CASE OF INFORMATION HISTORICAL STUDY ON ITS OWN RIGHT

In my presentation I'd like to call attention to an important development in 18<sup>th</sup>-century Prussia. I'd also like to outline the irreversible stimulation this development meant in the process of bureaucratisation and show what information and information users facilitated the rise of the modern state.

Let me show you a slide with a quotation by Toni Weller, a researcher who underlined the importance of approaching history from the perspective of information history. "*Information history is a distinct form of historical study in its own right, which looks at the role of information within past societies.*" (Weller, 2007) I agree that we cannot reduce our attention to the development of info technology tools - from writing all the way to mobile communication.

In the context of information history a really important, historic breakthrough, or turning point, is represented by the reforms introduced by the Prussian king Frederick William I. The importance of these seemingly minor developments is indicated by the fact that they made Michel Foucault, the influential French historian and philosopher regard the state of Prussia as the first modern European State.

## II. THE REFORM OF PRUSSIAN SYSTEM OF CONSCRIPTION

### A. The problem of recruiting and supplying soldiers

The absolutist monarchies in the early modern period created new areas of state intervention by gathering information with the aim of having a stronger standing army than other states. Recruiting suitable men remained the main weakness of professional armies in the 18<sup>th</sup> century. The standing armies were filled with for-

eigners in search of adventure or on the run since recruiting citizens caused an array of conflicts. The aristocratic colonels (Regimentsinhaber, Regimentschef) tended to protect their own peasants while at the same time pressing other landlords' peasants into service.

The Prussian army solved this problem under Frederick William I in a single administrative step. In 1733, the king assigned the borders of specific districts supplying the regiments. In such regions (cantons), all the young men of an age eligible for conscription, except the nobles, were registered and a given regiment was filled up with recruits from a given canton from that time on. However, the colonels were drawn from other districts. Naturally, the regiment was allowed to continue recruiting foreigners.

The file about the soldiers of a given regiment, the so-called "Stammliste", had existed for a long time already, but this registration process of men could have been deemed unique in Europe at that time. The new "Stammrolle" contained some information about the physical condition and social status of the local young men. The height of the young recruits was especially important because the long muzzle-loading rifles needed long arms to handle them, and a taller man could shoot at a greater distance from the same standing position.

Not all young men were listed in this way since the officers found only one out of seven young men suitable. By law, their social status changed immediately, i.e. they were not subject to the ordinary civil jurisdiction led by local nobles but were instead placed under military jurisdiction from this moment on.

After the registration procedure, the potential draftees were allowed to go home, and they were then actually conscripted if the need arose.

### B. The benefits of the cantonal conscripting system

The registration process of the cantonal recruiting system based upon the principle of universal conscription was almost complete. Not every territory and settlement was covered by the network of cantons due to another basic principle of Frederick William. He wanted to be aware of and increase the revenue generating capacity of his country and the cost of supporting a standing army could easily disrupt the economy. Towns and special social groups could ask for exemption from service, for example artisans, peasants with their own farms, wealthy city dwellers (property worth over 10,000 talers), the sons of clerics if they were studying theology. The young men who were called up had to complete a two-year-long period of service, and then they were

allowed to return home in peacetime. The recruits remained reservists for 18 years, which represented a wholly new category in military history. They had to undergo refresher training for two or three months each year. Leave of absence was another innovative phenomenon in the history of standing armies, and it is hard to imagine it without the registration system.

The cantonal system had far-reaching social consequences. The social prestige of a man as the king's soldier increased, all reservists wore their uniforms in church on Sundays, which in fact was required by the authorities, although it must be noted that the reservists wore their uniforms with pride.

The state came to life from the perspective of the common people of Prussia in the moment that they were registered by the state. The military required discipline and the registration process made desertion almost impossible because the state had the power to sanction a deserter's family. At the same time, the state offered special career prospects and a certain degree of safety for poor men against the local landlords (Junkers) or patricians (in towns). Wearing uniforms made everybody aware of this change in the social structure.

Prussia became a unique country in the sense that young men knew from an early age if they would be enlisted in the future or not and if so for how long and where they would serve. Frederick William established education for peasants in order to produce sergeants who could read, write and were numerate. No other army in Europe used so many written instructions (Ordonnanz) and detailed regulations as Prussia did at that time. The act of "Enrollierung" could also be seen as a test of basic skills.

Frederick William I used the military-service as a training instrument for civilian life too. The barracks became the venues of an early form of vocational education and provided opportunities for better farming and for doing handicraft at home. Just as Frederick William envisioned it the state of "handy hands" was born. Frederick William believed that every citizen can be taught something useful.

The conscription system made it possible to develop the fourth largest army in Europe with considerable reserves, although Prussia ranked only tenth and thirteenth in terms of territory and population. The regiments became, so to stay, like the immortals, i.e. the Persian elite troops in ancient times. The cantonal system increased morale and cohesion. The regiments as well as the cantons were competing on the battlefields and in their training. The earlier high rate of desertion cases decreased rapidly after 1733.

Due to its obvious advantages the cantonal system was adopted by other countries (the Habsburg Empire, Hessen-Kassel) in a very short time, moreover, the major changes of a simple administrative measure encouraged bureaucratic methods significantly.

### III. CONCLUSIONS: THE SIGNIFICANCE OF "BEING ENLISTED" IN INFORMATION HISTORY

Military service did not become a simple burden but a protection against local nobles, moreover a chance for upward social mobility due to one single information gathering process. The service and exemption had a predictable system free from feudalistic ad-hoc interventions. The military was integrated into the population, and the population was discovered as a developable resource for the army and for the economy. Information gave the state and the population a remedy for planning. Such information provided an opportunity for a state policy, the aim of which was to augment the forces of the state from within.

First the army soldiers were trained for military and civilian life, and then the study and training of more and more social groups started. Foucault left the question of which steps and ideas of the Prussian government were the first that approached the various segments of the entire population as developable and potentially accountable. In my opinion it was the effects of cantonal system of drafting that confirmed the decision-makers in their ideas. That is why – I think – the study of the General Directory records may be centrally important in researching the rise of the modern empire and the concept of information. The question is how the names by which the objects and subjects of state intervention were referred to changed along with their justification under Frederick William I and Frederick II?

The annually supervised "Stammrolls" opened new opportunities for nation building. The Prussian commissars did not use any new medium in this process, moreover, this technique did not require printing in itself, indeed the same form of census was carried out in Egypt over 4,300 years ago (Jacoby, 22). The encouraging impact for other states and for other administrative methods could be considered as the special relevance of the Prussian conscripting system. The affectation for files increased tremendously inside the Prussian state in the 18th century.

There were so many files about issues and people everywhere in the Prussian administration that many European travellers viewed Prussia as the biggest prison in the world because of the "ubiquitous" registration of every phenomenon at the end of the 18<sup>th</sup> century. (Jacoby)

The local priests, and not civil servants, were usually entrusted by the officials with writing and refreshing the "Stammroll" of a given district until 1763. The registration process was not centralized and standardized in the modern sense of bureaucracy, so it did not enable sophisticated information management activities. These practical databases were not merged or synchronized into one or more central database but the data was rather refreshed by the officials each year. The king supervised the completeness of the regiments many times, so this data gathering could be perceived as a competitive task of military and civil officials with in the interests of all concerned, i.e. the soldiers of the regiments, the noble officers, and, in part, the population itself.

Frederick William did not institute efficient information management by methods available to him but developed a bureaucratic system and pool of officials open to using the new tools of statistics, cataloguing and cartography, especially in cases when they had previously proved useful. Frederick William

- achieved the cooperation of various offices and bodies by forcing them to regularly participate in joint sessions;
- had efficient information flow between colleagues investigated and tested;
- and filled bureaucratic positions with people from the innovative Pietist schools who had a strong sense of calling and can be regarded as the early managers.

The scope of competence held by Prussian officials seems chaotic today: the same official had competence in various affairs and various offices. However, these overlaps gave rise to a kind of competition in problem-solving and argumentation, and for the practical-minded king arguments could be best supported by figures.

The completion of decentralized data collecting opened up the opportunity to create a central database of the people. Prussia made one step towards this *control revolution of the state* – a hundred years before the industrial revolution, meaning that the material needs of heavy industry, the speed and freight capacity of traffic and big business ventures made the control revolution necessary according to James Beniger.

Being observed and being registered, being a case with statistical attributes meant that people could be controlled, led or manipulated from a great distance more directly than if they had been “unregistered”. Henry Jacoby observed the paradox relationship between bureaucracy and citizenship: more individual freedom from the local community or local authority correlate to bigger central administration. *The first step towards this tension of our era was made*: to be registered. Building a real bureaucratic state needed more connection of information, but the irreversible driver, the feedback in this direction was born under the Frederick William I in Prussia.

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