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## Preserving the Geographical Production Process

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Index of Figures.....	6
Index of Tables .....	6
Abstract.....	7
1 INTRODUCTION.....	8
2 FIRST WORKSHOP .....	8
2.1 List of participants.....	9
3 PRESERVATION INITIATIVES .....	9
3.1 From Lithography to Digital Data.....	9
3.2 Preservation of the Geographical Production Process. The Story of a Case: NGI/IGN (Belgium) .....	11
3.3 Lithography Museum of the Bavarian Agency for Surveying and Geographic Information, Munich .....	12
3.4 The web technology based relational data base of the heritage of the Belgian Royal Military Academy .....	13
3.5 Preservation at Swisstopo.....	14
3.6 Work in Great-Britain .....	15
3.7 Preservation and valorisation at IGN France .....	16
3.8 The colonial mapping of Ethiopia in 1935-1941.....	16
3.9 International collaboration for preserving and promoting the Struve Geodetic Arc 16	
3.10 Reconstruction of the library of Mercator .....	17
4 CONCLUSIONS.....	17
5 POST-CONFERENCE WORKSHOP INTERNATIONAL COUNCIL ON ARCHIVES .....	18
5.1 List of participants.....	19
5.2 Presentations .....	19
6 CONCLUSIONS.....	20
7 SECOND WORKSHOP .....	21
7.1 List of participants.....	21
7.2 Some excellent practices .....	22
8 CONCLUSIONS.....	23
9 ONGOING WORK .....	23

# Preserving the Geographical Production Process

With 9 figures and 3 tables

Author(s)

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## Index of Figures

Figure 1: By browsing forgotten bookshelves and rooms at NMCA's one still can find treasures: Photos demonstrating old production processes, instruments from the old times, and instruction books. When brought together they yield complete reconstructions of old geographic production processes and a better understanding of the maps of those days. (Source: NGI Belgium). .....	10
Figure 2: Replaying and recording of old geographical production processes. An example at the Abbey Ter Kameren, the premisses of NGI Belgium (Source: NGI Belgium) .....	11
Figure 3: A textbook example of the preservation of the geographical production processes by the Bavarian Agency for Surveying and Geographic Information. (Source: LDBV Bayern) .....	12
Figure 4: A proposed conceptual data model to register items, objects, publications, instrument and even people on the geographic production process. (Source: RMA Belgium) .....	14
Figure 5: At the 100th anniversary of Swisstopo in 1938, documentaries were made to demonstrate the geographical production processes, thereby in fact contributing to the preservation of the geographic production processes.. Recently these films have been digitised and brought online for the general public. (Source: Swisstopo). .....	15
Figure 6: IGN France set-up a channel with digitised old movies demonstrating geographical production processes. Like Swisstopo has done as well. ....	16
Figure 7. Finalizing the common understandings. Mr. Rickenbacher from Swisstopo (Source: rwk).....	18
Figure 8. Vivid interaction between the audience and the speakers. ....	19
Figure 9. Intensive discussions during the break-out sessions. Ingrid Vanden Berghe and Göran Samuelsson. ....	20

## Index of Tables

Table 1: List of Participants.....	9
Table 2: List of participants .....	19
Table 3: List of participants .....	22

## Abstract

This report Is the final report of the EuroSDR-project “Preserving the Geographical Production Process”. In two one day workshops (spread over two days) and one post-conference workshop at the first annual conference of the International Council on Archives (ICA, since 1948) we have investigated the problem of the fading away of knowledge on the geographical production process, identified initiatives in Europe that preserve crucial parts of the geographical production process and the need for further awareness raising and a European forum for further cooperation, as:

- we share a common history of the geographical production process (although not always happening at the same speed),
- different parts of that history are preserved throughout Europe,
- the awareness of the need to preserve the geographical production process – in order to understand our geographical products today and in the future – is not sufficient by many of the producers and could be improved by a forum,
- local preservation initiatives lack a European, collaborative, cross-domain (NMCAs, libraries, archives and museums) approach that could avoid multiplication of the same efforts (such as the design of a database) on institutional and country level, which is in many cases hampering the preservation process.

This report describes the project, presents the conclusions and contains the main deliverables of the project, which are:

- Two workshop reports
- Raised awareness amongst others at the relevant umbrella organisations: EuroGeographics, International Council on Archives (ICA) and the International Cartographic Association (ICA)
- International Council on Archives first Annual Conference post-conference workshop to grow awareness in the global, archival community of geographical information (the data itself, the preservation of its production process, and as instrument to open-up archival information)
- An overview of the scattered preservation initiatives related to National Mapping Agencies (NMAs) throughout Europe
- Books (“Cartography. Vision on the map” (2016) for Dutch speaking archivists, and a chapter on “Evolution in Knowledge and Technology” in a book about Historical Cartography (in prep.))
- Inherent to the project, new initiatives on the preservation of the geographical production process, including
  - a cooperation between the University of Gent and the National Mapping Agency of Belgium that digitized and inventoried documentation and objects, and documented working processes by replaying and recording old working processes
  - ongoing work on a standard to describe witnesses (items, objects, ...) of the geographical production process by the Royal Military Academy of Belgium, UGent, and the NGI-Belgium with the aim to develop a standard that could suit international cooperation
  - the inheritance by the UGent from Alan Wright of his extensive collection of survey instruments. This collection not only outlines the important innovations in the geodetic instruments after WWII, but is also a reflection of a remarkable life in service of science
  - an exhibition (2017) titled “Pushing the Boundaries” on the Wright-Draper collection of geodetic instruments in the Science Museum of Gent University



- an overview of institutions, societies, people, and their ‘local’ initiatives, as a starting point for collaboration
- a refined and reworked standard from the Royal Military Academy for the description of objects and documentation that could be potentially used as starting point for a European, collaborative database

We are grateful to all participants of the workshops. The exchange of knowledge and experiences has been a very valuable result to all of us, and could only be realized by the dear support of EuroSDR. We would like to thank EuroSDR for the support. We are also grateful for the support of EuroGeographics, the International Council on Archives and the International Cartographic Association.

## 1 INTRODUCTION

While the preservation of paper maps is well understood and put into practice, knowledge on the historical production process, and especially the pre-digital production process in the 20th century as it was practiced by many National Mapping Agencies (NMA), is now disappearing and has hardly been documented. The last witnesses of this era, people and objects, will be gone in just a few years. Hence, EuroSDR launched a working group on the Preservation of the Geographical Production Process. This initiative is also supported by EuroGeographics, the International Cartographic Association (ICA) and the International Council on Archives (ICA).

In order to get a hold on the current situation and to find common grounds and goals we have started with an exploratory workshop on the Preservation of the Geographical Production Process, in the form of a roundtable for NMAs, academic institutions, museums and relevant societies and networks that are concerned with the preservation of the geographical production process and willing to put their experience and knowledge into a joined project.

With the exploratory workshop the EuroSDR heritage working group created a roundtable for NMA’s, academic institutions, museums, private companies or ICA-members concerned with the preservation of the geographical production process and willing to put their experience and knowledge into a joined project.

## 2 FIRST WORKSHOP

The workshop was held on the second half of the 21st of May and in the first half of the 22nd of May at the Belgian National Geographic Institute, in Brussels, organized by a consortium of the NGI, Swisstopo and Ghent University. The first day was used to present different initiatives taken throughout Europe to preserve geographical production processes. And the second day was used to conclude the first day, a discussion the way ahead and the drafting and confirmation of a closing statement. The workshop was opened by Ingrid Vanden Berghe, administrator-general of the NGI and president of EuroGeographics.

The main target the exploratory workshop has to deal with is how to preserve knowledge on the pre-digital production process on a European scale. This implies:

How to

- Deal with the material sources: instruments and documents
- Make the authorities aware
- Open up the knowledge on the production process for researchers and NMA’s in the first place, and for a broader public on the long term

## 2.1 List of participants

First name	Last name	Association	Country
Maurice	Kavanagh	Ordnance Survey Ireland	Ireland
Michel	Bacchus	Institut géographique national France	France
Rob	Wheeler	Charles Close Society	UK
Paul	De Candt	Aquaterra	Belgium
Maurice	Kavanagh	Irish Ordnance Survey	Ireland
Erkki-Sakari	Harju	Surveyor Counsellor, hon., Chief Cartographer (retired)	Finland
Philippe	Ledent	Spacebel S.A.	Belgium
Martin	Rickenbacher	Swisstopo	Switzerland
Hugo	Pastijn	Royal Military Academy	Belgium
Jan	Nyssen	Ghent University	Belgium
Karen	De Coene	Ghent University	Belgium
Philippe	De Maeyer	Ghent University	Belgium
Rink W.	Kruk	National Geographic Institute	Belgium
Ingrid	Vanden Berghe	National Geographic Institute and EuroGeographics	Belgium
Joep	Crompvoets	Secretary General of EuroSDR	Belgium
Wolfgang	Stoessel	Landesvermessungsamt Bayern	Germany
Saulius	Urbanas	Struve Arc Geodetic Committee	Lithuania
Herman	Quee	The Dutch Circle (History of Geodesy)	The Netherlands
Herman	Prils	NGI (retired), Ghent University (guest)	Belgium
Jan	De Graeve	Surveyor and historian in surveying techniques	Belgium

Table 1: List of Participants

## 3 PRESERVATION INITIATIVES

### 3.1 From Lithography to Digital Data

The first presentation was a short Introduction to the manual cartographic production techniques in the National Land Survey of Finland, which somehow is exemplary for the history in Europe, although differing in time and evolution speed, by Erkki-Sakari Harju, Surveyor Counsellor and honorary Chief Cartographer (retired).

The Lithographic Printing House of the National Land Survey of Finland (later on called the Publications Division of the Finnish National Board of Survey) was founded in 1918, one year after Finland got its independence from Russia. We can say that this organization was the heart of cartographic production in Finland up to 1990. The time of first 20 years was the development of national mapping, both cadastral and topographic.

The Second World War brought its own demands for cartographic production: lack of paper and reproduction chemicals, bad production facilities and a constant need for rapid production. One solution was to replace lithographic stone by zinc plate.



Figure 1: By browsing forgotten bookshelves and rooms at NMCA's one still can find treasures: Photos demonstrating old production processes, instruments from the old times, and instruction books. When brought together they yield complete reconstructions of old geographic production processes and a better understanding of the maps of those days. (Source: NGI Belgium).

The time after the war brought a rapid development to the cartographic production. Transparent PVC plastic sheets for drafting and reproduction, new large size reproduction cameras, durable and stable polyester films for drafting and reproduction, diazo printing, new high quality graphic arts photographic films, phototypesetting, scribing, cut and peel masking etc. Lithographic printing went off and offset came instead of it.

Gradually from the year 1980 onwards the digital techniques began to step in, at first replacing typical manual production procedures as coordinate plotting, drafting and scribing, later on taking over larger parts of the production as simple generalisation procedures, digitizing data in raster form, performing the colour separation and plotting the printing originals in CMYK system. The last one was a remarkable change in printing as the four colour system replaced the five or six colour printing.

The presentation included also a short description of pre-press processes for lithographic printing.

### 3.2 *Preservation of the Geographical Production Process. The Story of a Case: NGI/IGN (Belgium)*

The second presentation gave insight in the danger of disappearing knowledge and steps to counter that awkward development and was given by Karen De Coene from Ghent University.

Since the Belgian independency map making has been the core business of four consecutive national mapping agencies of which the National Geographical Institute NGI-IGN is the last representative.

The enormous evolution in map making techniques throughout the twentieth century resulted in a constant change of the geographical activities. Although National Archives in most countries have an interest in preserving information about geography, knowledge on the historical production process is steadily disappearing and there is little awareness on the importance of the preservation of these processes, as they provide crucial insight in the information that a map can provide. The danger that especially the pre-digital production process of 20th century Belgian cartography will become a poorly documented topic in the history of science should be considered.



Figure 2: Replaying and recording of old geographical production processes. An example at the Abbey Ter Kameren, the premisses of NGI Belgium (Source: NGI Belgium)

Out of this concern a cooperation has been established between NGI and Ghent University (Department of Geography) with four main objectives. First, the physical heritage of the NGI-IGN should be preserved. Second, the knowledge on the production process should be opened up. Third, sensibilization and communication on the historical land surveying and mapping of Belgium is an important concern. And finally, there is a need for scientific research. The initial plan to achieve these results, was to make a digital repertory of the

remaining geographical heritage. The arrangement of this plan shed light on both opportunities and difficulties of the project.

### 3.3 *Lithography Museum of the Bavarian Agency for Surveying and Geographic Information, Munich*

The presentation was about the impressive work, history and its valorization and popularization for the general public of the Bavarian Agency for Surveying and Geographic Information and was given by Wolfgang Stöbel, Head of Department of Photogrammetry and Remote Sensing, Landesamt für Vermessung und Geoinformation (LVG) Bayern, Germany.

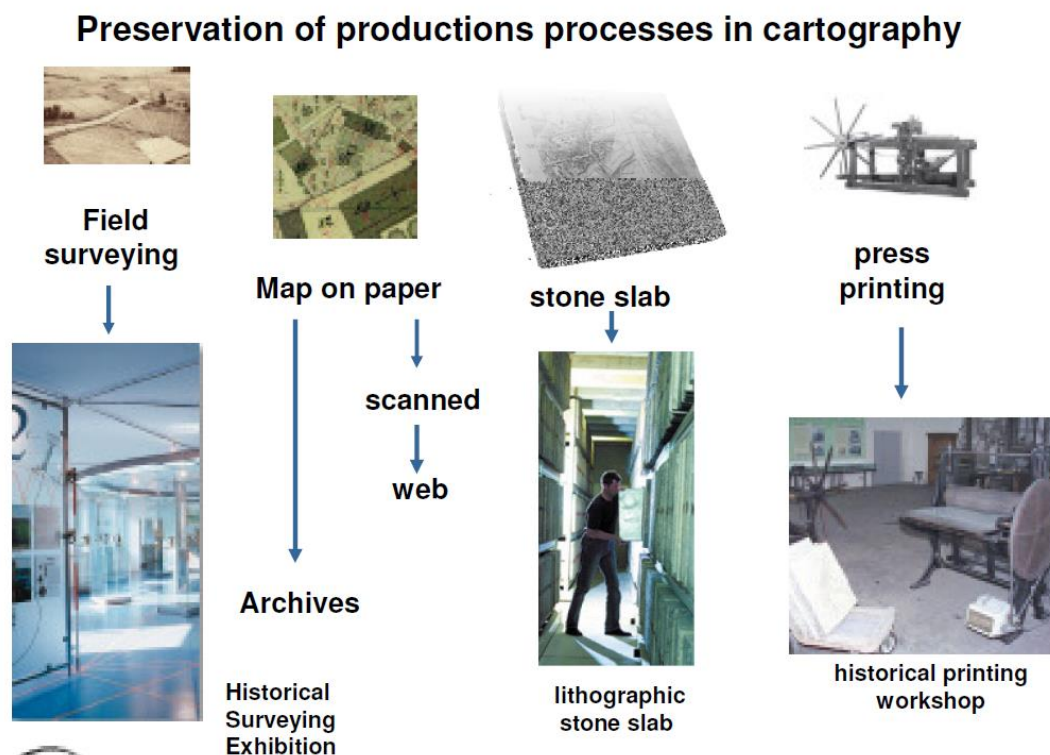


Figure 3: A textbook example of the preservation of the geographical production processes by the Bavarian Agency for Surveying and Geographic Information. (Source: LDBV Bayern)

The Bavarian Agency for Surveying and Geographic Information is one of the oldest and one the most modern government offices in Bavaria. At any time in history the land surveyors and the cartographers were inventing and trying out newest techniques, inspiring new developments in mathematics, physics, optics, mechanics and electronics. They have been pioneers and they are still pioneers today in many fields. The Exhibition of historical surveying equipment, the Cellar with the lithographic stone slabs and the Exhibition of historical printing techniques and equipment at the Bavarian Agency for Surveying and Geographic Information is showing this in a very impressive way. And of course it is a very good example of preserving cartographic and geographical production processes for the next future.

In the lithographic archive are 26.637 stone slabs stored, dating from the early beginning of the surveying and mapping of Bavaria in the early 19th century. They are now under national cultural heritage protection. The use of these stone slabs for reproduction of cadastral maps is shown in the Exhibition of historical printing techniques and equipment. On special occasions demonstrations are given, how this printing was carried out.

The investment in the preservation of historical production processes will be rewarded in a manifold way. It is great attraction to the public, pupils and students and professional colleagues from the country and from abroad. In Munich, the LVG is taking part in the annual Long night of the Museums, a joined nightly event of all museums in Munich and is attracting many visitors, who enjoy the “coolness” and ambiance of the cellar full of history. And it finds a great response in the media, newspapers and TV. Of course, the history has to be on the web as well. Presentation of historical geodata like topographic and cadastral maps and historical aerial images on the web, easily accessible to everyone, lively computer animations with combinations of actual and historical data are all helping to put your organisation in the limelight of the public.

### *3.4 The web technology based relational data base of the heritage of the Belgian Royal Military Academy*

The presentation was about a developed web-based relational data base of the heritage of the Belgian Royal Military Academy that we could potentially use, in an adapted form as a collaborative platform for European cooperation. In the course of the existence of the EuroSDR-working group, and thereafter, the standard used in the aforementioned webdatabase has been checked with existing collections (such as the one of the NGI Belgium) and adapted. The presentation was given by Hugo Pastijn on behalf of the designers G. Peene and Cl. Vloeberghs, Belgian Royal Military Academy.

The Public Relations department of the Royal Military Academy (RMA) with members of its Association of Alumni (AA) joining an existing informal group of volunteers, created since 2009 a team of about 10 members which is managing the historical inheritance of this Belgian military institution, which was founded in 1834 and was located at the premises of the current National Geographic Institute in Brussels from 1874 till 1908.

The collection of items includes i.a. scientific instruments, didactical devices, computational equipment, documents, lecture notes, books, photos, multimedia items, art, maps, architectural documentation, posters and digital documentation. The team is also running a permanent exhibition showing the history of the RMA. In addition it is managing a data base of alumni, personnel, staff, teaching faculty and researchers of the RMA since 1834. Till today all these items and data are registered in separate disconnected digital lists, mostly implemented in a popular spreadsheet format.

Since 2012 G. Peen took the initiative to develop a relational data model for geographic heritage, for which a prototype relational data base is implemented since the beginning of 2013, based on internet technology. This prototype is in its initial phase of testing on a server of the RMA.



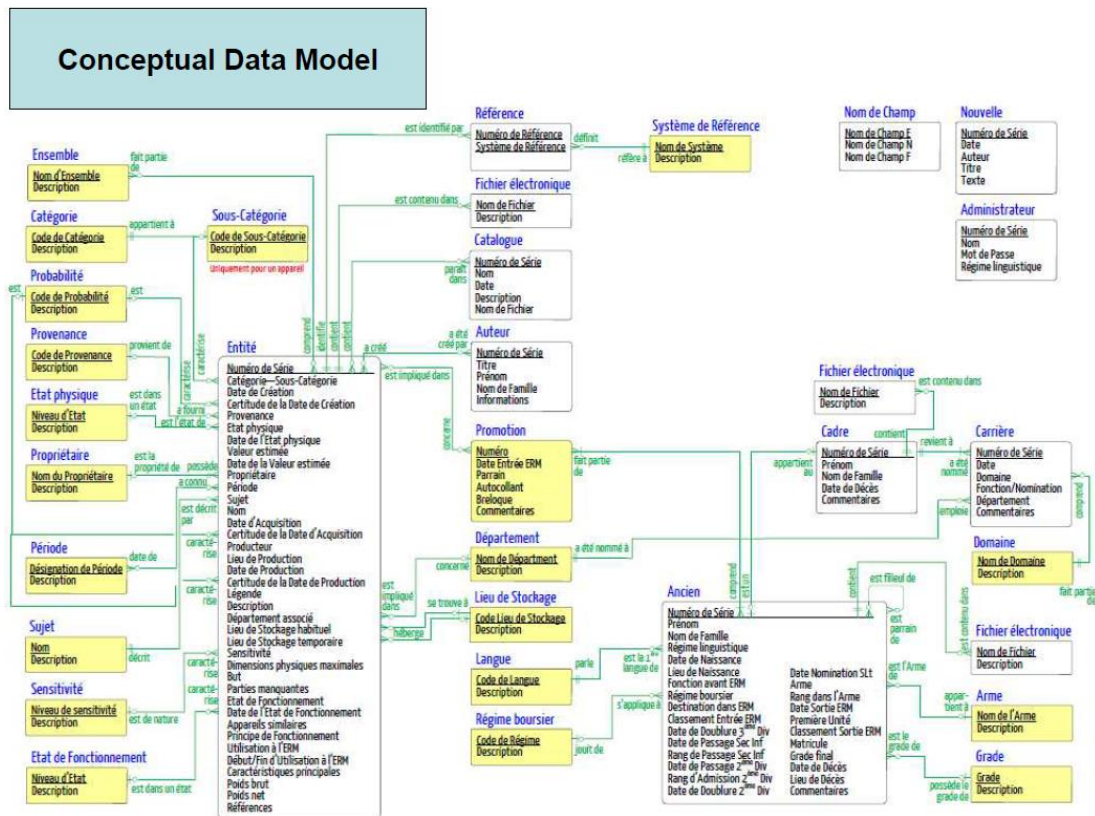


Figure 4: A proposed conceptual data model to register items, objects, publications, instrument and even people on the geographic production process. (Source: RMA Belgium)

The presentation to described the structure of the prototype, the remote access possibilities for different categories of users/customers, as well as the future possibilities for links with similar initiatives in the European context of data sharing of heritage in the fields of topography, geodesy, geography and map production technology.

### 3.5 Preservation at Swisstopo

The presentation was about the preservation of different types of information: (1) maps and images, (2) instruments, and (3) methods. It was presented by Martin Rickenbacher, Senior Scientist, Swisstopo, Switzerland. Swisstopo has digitized all of its old maps and is currently digitizing all of its aerial photographs and has published its metadata in web-accessible catalogs. During the digitization of the maps and aerial photographs they have realized that information about the geographical production process of those items is crucial for understanding the information on them. Swisstopo has been documenting thoroughly the production process of the maps (and photos) throughout the last centuries, which made them decide to publish this information together with information on the old map series on their website, including digitized version of old documentary movies. They have started inventorying and documenting the instruments that are stored on the attics of their buildings.



Figure 5: At the 100th anniversary of Swisstopo in 1938, documentaries were made to demonstrate the geographical production processes, thereby in fact contributing to the preservation of the geographic production processes. Recently these films have been digitised and brought online for the general public. (Source: Swisstopo).

### 3.6 *Work in Great-Britain*

The presentation was about preservation activities by the Charles Close Society (GB), given by Rob Wheeler.

The Charles Close Society was founded in 1980 by a small group interested in the practices of the Ordnance Surveys of Great Britain and Ireland, so was in the fortunate position to start a programme of recording processes before digital technology came in. Almost all of this work concerned the Ordnance Survey of Great Britain (OSGB): much less has been done on the Ordnance Survey of Northern Ireland; and the Ordnance Survey of Ireland was an early adopter of digital techniques.

The geographical production process can be seen as divided into three stages; (1) from the physical reality to the surveyor's record; (2) from the surveyor's record to what is intended to appear on the map; and (3) the way in which the physical process of map production modifies this last intention. For OSGB, the first and second stages were controlled by loose-leaf instruction manuals. We have facilitated the archiving of many copies of these at different states of amendment; to produce a continuous record of how the manuals changed over time is as yet only an aspiration. The importance of the third of the above stages declined in the era when drawn / scribed materials replaced lithographic stones (or zinc plates) as the reprographic base.

One of the Society's early successes was to save the production files for most of the pre-digital map series since about 1947. These are now held in Cambridge University Library and contain the production histories of each individual sheet. They are invaluable in demonstrating that the standard accounts are often generalisations. Different sheets actually followed slightly different processes. Official mapping institutions (at least in the UK) were bureaucratic institutions: things only happened if paperwork was generated, and that paperwork was routinely filed. So where archival material of this nature conflicts with peoples' memories, we are inclined to regard the archive as more reliable.



### 3.7 *Preservation and valorisation at IGN France*

The presentation was about initiatives to collect scattered documentation on old geographical production processes and the digitization of old documentaries on the geographical production processes and its publication on YouTube. It was presented by Michel Bacchus from the Institut géographique national, France.



Figure 6: IGN France set-up a channel with digitised old movies demonstrating geographical production processes. Like Swisstopo has done as well.

### 3.8 *The colonial mapping of Ethiopia in 1935-1941*

The presentation was about the importance of knowledge about the old geographical production processes, which was clearly demonstrated by this case: the creation of 3D stereo-models and orthophotographs from old aerial photographs from 1935-1941 of Ethiopia. The well-kept production history, as well as the camera parameters allowed the author to build such modern 3D models and orthophotographs of the past. It was presented by Jan Nyssen from Ghent University.

### 3.9 *International collaboration for preserving and promoting the Struve Geodetic Arc*

The keynote presentation of the workshop was about the Struve Geodetic Arc, the example of preservation of a fundamental geographic production process, the international cooperation to fulfil these aims and, especially its awareness rising even up to its recognition as World Heritage. The presentation has been given by Saulius Urbanas, EuroGeographics and Secretary General of the Coordinating Committee of the Struve Geodetic Arc

The Struve Geodetic Arc is a chain of triangulation survey stretching more or less down the 25th E line of longitude from Hammerfest in North Norway on the Arctic Ocean over 3000 km south to Izmail at the Danube delta in Ukraine. The Arc was set up and measured from 1816 to 1855. The goal was to most precisely determine the geometric dimensions of the Earth, its shape and size. To approach the goal, F.G.W. Struve and other leaders of the arc measurement have set a high level of international co-operation in various directions, from political and administrative to scientific and technical. The arc measurement had unprecedented stretch and accuracy; therefore it made substantial and long-term impact regarding science and practise. In today's geography the Struve Geodetic Arc passes through ten European countries, i.e. Norway, Sweden, Finland, Russia, Estonia, Latvia, Lithuania,

Belarus, Moldova and Ukraine. Each of the ten countries possesses some sites with reliable signs, which mark on the ground the positions of the geographical points where the measurements were performed.

The National Mapping and Cadastral Authorities (NMCAs) of the ten countries of the Struve Geodetic Arc have together submitted the “Nomination of the Struve Geodetic Arc for Inscription on the World Heritage List” 2004 and the World Heritage Committee inscribed the Struve Geodetic Arc into the World Heritage List in July 2005. Since then NMCAs under support of national UNESCO committees, research institutions and initiatives of GI enthusiasts successfully collaborate in exchanging best practice and progressing in restoration, preservation and population of Struve Geodetic Arc. The Coordinating Committee of the Struve Geodetic Arc comprises national nominees of each country meets regularly at each second year. Participation in the Struve Arc Coordinating Committee meetings are open to national and international experts, representatives of governmental and non-governmental organisations and individuals, whom deal with activities related to Struve Geodetic Arc or protection of antiquities in field of geodesy in the territories of the States.

Despite many countries completed the excavation, documentation and commemoration of the sites of Struve Geodetic Arc the reporting and sharing achievements in a number of initiatives, like the initiation of post marks production, producing books, movies other scientific and promoting means makes the international cooperation extremely useful. The international collaboration is necessary further progressing with research and organisational matters extending (rather linking) the Struve Geodetic arc with the Central European and 30th Arcs following the endorsement of World Heritage Committee.

### *3.10 Reconstruction of the library of Mercator*

A final presentation was given by Jan De Graeve, delegated from the Council of European Geodetic Surveyors, whose personal ambition it is to bring back together all the books (or copy of books) and publication of the original library of Gerhard Mercator. This, in order to be able to reconstruct the environment and building blocks of Gerhard Mercator’s groundbreaking contributions to the geographical production processes.

## **4 CONCLUSIONS**

The conclusion from the first workshop was a closing statement that was confirmed by all participants that stated that they observe:

- a loss of knowledge on superseded map production processes
- a lack of awareness of the importance of the documentation
- a duplication of efforts in conservation and recording
- that professional users need to interpret geographic products of the analogue era correctly

They consider that there is a need for:

- recording (pre-digital) techniques and processes of collection of geographical information and mapmaking in NMCAs
- conservation of historic geographic funds (instruments, reprographic materials, etc.)
- a forum for the exchange of Best-Practice on a European level

We came also to the following common understanding that one needs to:

- conserve knowledge & samples: maps, instruments, methods (books, notes) & technical descriptions, personal anecdotes.
- preserve different types of production processes: geodetic, geo-survey, cartographic work, production
- bear responsibility
  - institutions that produced geo-info, academic world, private sector
  - institutions that preserve geo-info, archives, libraries, academic world
  - for a mind-shift: documentation on current production is currently insufficient and needs to be improved.
- Sharing publications, best practices, ...
- Find answers to questions related to the objects we want to preserve, such as
  - What do you want to preserve (1, many)?
  - What when it does not work anymore?



Figure 7. Finalizing the common understandings. Mr. Rickenbacher from Swisstopo (Source: rwk).

## 5 POST-CONFERENCE WORKSHOP INTERNATIONAL COUNCIL ON ARCHIVES

The workshop ‘Everything happens somewhere: Archives and Geographic information’ was organized in cooperation with the International Council on Archives and with additional support from Eurogeographics on the 25th of november 2013 at the National State Archives of Belgium in Brussel. We would like to thank the State Archives for its hospitality.

Although sometimes worlds apart, cooperation of the archival and the geographic authorities has become essential with the fast electronic revolution. That is to say:

- (1) Digital Geographic information and its geographic production processes need to be archived and remain accessible for the long term, although no sound methods exist yet and data now and in the past is being lost;
- (2) Geographic information and technologies could play a pivotal role in the accessibility of archival information;

Although several initiatives have been taken recently, both burning questions remain largely unanswered today. Hence, both communities need to join forces, and a great opportunity laid in Brussels with the presence of archivists from all over the world, and the European headquarters of national geo-authorities and spatial research, at the very same location. The aim of the workshop was to crossbreed the skills and knowledge of the archival and geographic authorities to tackle the issues mentioned above.

The first part of the day consisted of a more theoretical introduction:

- a broad outline of the challenges we face
- an introduction to the playing field and institutions involved
- the importance of (digital) geographic information (technologies) for the data we handle every day

The second part of the day will consist of a few case studies and break-out sessions to connect the different worlds of archival and geographic institutions.

### 5.1 List of participants

<b>Name</b>	<b>Organisation</b>	<b>Country</b>
Rink Kruk	National Geographic Institute	Belgium
Marc Carnier	State Archives of Belgium	Belgium
Ingrid Vanden Berghe	EuroGeographics, NGI	Belgium
Karel Velle	European Branch of the International Council on Archives	Belgium
Karin Honnacker	State Archives of Belgium	Belgium
André Streilein	Swisstopo	Switzerland
Jonathan Holmes	Ordnance Survey	UK
Philippe De Maeyer	Ghent University	Belgium
Joep Crompvoets	EuroSDR / KULeuven	Belgium
Joost Depuydt	City Archive Antwerp	Belgium
Gijs Boink	National Archive	Netherlands
Dominique Taffin	AD Martinique	France
Njörður Sigurðsson	National Archives	Iceland
Michal Henkin	Israel Archives and Information Association	Israel
Eustache Sitaki	National Archives	Burundi
Zakaryae Bendrioua	National Archives	Morocco
Salvador Barragan	International Monetary Fund	USA
Philippe De Maeyer	Ghent University	Belgium
Gustavo Urban	National Archives	Argentina
Tommy Balle	National Archives	Denmark
Göran Samuelsson	Mid-Sweden University	Sweden
Egbert Jongsma	Dutch Court of Audits	Netherlands
Tine van Nierop	Digital Heritage Netherlands (Heritage & Location)	Netherlands

and a few unregistered participants.

Table 2: List of participants

### 5.2 Presentations



Figure 8. Vivid interaction between the audience and the speakers.

The meeting was cordially opened by the president of the European Branch of the International Council on Archives and was host of the day.

The first four presentations demonstrated the context of the issues addressed.

The first presentation was given by Ingrid Vanden Berghe (president of EuroGeographics) about connecting Archival and National Geographic Information Authorities.

The second presentation was given in

name of the president of the Dutch Court of Audits (Saskia Stuiveling) by Egbert Jongsma about the importance of geo-information, including the knowledge about the geographical production processes for the work of the national auditors and archivists.

The third presentation was given by Rink Kruk (NGI) and Marc Carnier (State Archives of Belgium) about Geo-information as a tool for accessing archives, in particular about the Cartesius initiative of Belgium.

The fourth presentation was given by Philippe De Maeyer about preservation of the geographic production process, and potential ways to improve the awareness of mapping agencies and archives about the importance of preserving this knowledge.

It then was followed by a framework for archiving of geographic information by the presentation of Jonathan Holmes about the EuroSDR-document: GI+100: Long term archiving of digital Geographic Information - 16 fundamental principles agreed by National Mapping Agencies and State Archives.

It then was followed by two practical examples that demonstrated the intertwining of roles of National Mapping Agencies and National Archives.



Figure 9. Intensive discussions during the break-out sessions. Ingrid Vanden Berghe and Göran Samuelsson.

The first presentation was an example from archiving geographic information seen from the Mapping Agency side by André Streilein (Director at Swisstopo, Chairman EuroSDR): Archiving and long-term availability of federal geodata in Switzerland (by Swisstopo).

The second presentation was on the Scandinavian way of archiving geodata, including the use of open source software, but then seen from the Archival point of view, given by Göran Samuelsson,

senior lecturer, Archives and information science, Media Mid Sweden University.

We then split up in small groups for discussions, departing from the 16 principles from the GI+100 EuroSDR-document.

## 6 CONCLUSIONS

Understanding the meaning and usefulness of geographic information for society, governance and business is acknowledged by the participants and also by the participants that could not come but discussed with us by mail and during the conference beforehand.

Archival standards do not include sufficiently a reference to location. And when they do, they are not conform the developed standards from the geo-community (such as for example comparable elements of ISO19115), which make these standards in fact unusable for geographic tools (such as a geographic search in a geoportal). Members of the archival standardization committees (discussions by mail beforehand and at the conference) consider it absolutely necessary to adopt the proper international geo-standards into archival

standards, but their peers find location a minor issue with regard to archival context and in fact insufficiently aware of its power.

Many Archives and National Mapping Agencies are not prepared for archiving modern types of geo-information. The data is produced, but not archived. Partly, because archives are neither experienced in handling geodatabases, nor in making these databases accessible, nor by keeping these accessible through time. It is often neglected to preserve the knowledge about the geographical production process, which means that geographic information that is preserved is harder to interpret later in time, if no records are kept of how that data was made.

Quote of the day: *I am so happy that you have invited me. Before this workshop I had no idea what geographic information is truly about and its power to open-up all kinds of evolution in society, government and business. In fact, I was quite reluctant to come and quite skeptical to the important role of geographic information and the importance of its preservation. You have opened my eyes and I am going to spread the word of Geo-information.*

## 7 SECOND WORKSHOP

The successful kick-off meeting organized in Brussels at the National Geographic Institute in 2013, was followed by productive and positive meeting at Ghent University on the 1st and 2nd of December 2014. The 2nd half day was held jointly with the symposium by the International Cartographic Association (ICA) commissions on Map Production, and on the History of Cartography.

Our workshop focused on the organizational aspects (future), on a framework for cooperation, which was illustrated by a few excellent practices from amongst others Norway, Sweden, Switzerland, the Netherlands, the UK (Charles Close Society) and Belgium. Main questions were: how to preserve our heritage of cartographic production methods and how to sustain preservation and research in a national and international context.

### 7.1 List of participants

First name	Last name	Association	Country
Nico	Bakker	Kadaster	Netherlands
Christopher	Board	Charles Close Society	United Kingdom
Paul	De Candt	Aquaterra NV	Belgium
Karen	De Coene	Ghent University	Belgium
Jan	De Graeve	IIHS&M	Belgium
Philippe	De Maeyer	Ghent University	Belgium
Alain	De Wulff	Ghent University	Belgium
Erkki-Sakari	Harju	The Cartographic Society	Finland
Francis	Herbert	RGS-IBG (retired)	United Kingdom
Rink	Kruk	National Geographic Institute	Belgium
Sidsel	Kvarteig	Kartverket	Norway
Elri	Liebenberg	ICA / University of South Africa	South Africa
Rose	Mitchell	National Archives	United Kingdom
Jan	Nijssen	Ghent University	Belgium

Jean-Luc	Parmentier	National Geographic Institute	Belgium
Hugo	Pastijn	Royal Military Academy	Belgium
Martin	Rickenbacher	Swisstopo	Switzerland
Thorsten	Ries	DARIAH-Network	Belgium
Martin	Schlatter	Swisstopo	Switzerland
Veerle	Van Eetvelde	Ghent University	Belgium
Helga	Vermeulen	Ghent University	Belgium
Soetkin	Vervust	Ghent University	Belgium

Table 3: List of participants

## 7.2 *Some excellent practices*

Norway's national mapping agency (Sidsel Kvarteig) demonstrated several excellent examples, such as the website [www.digitaltmuseum.no](http://www.digitaltmuseum.no) that gives us digital access to images of amongst others cartographic production tools. The website and metadata-standard is in Norwegian and Swedish only, but the company that built the website would be happy to be of assistance in an international framework. Another example is the small museum they built with the help of (retired) colleagues and volunteers that shows complete production settings from the past (as if the employee just walked away), which was even inaugurated by the King of Norway.

Swisstopo (Martin Schlatter) demonstrated several initiatives with regard to their heritage: (1) a dynamic and interactive viewer with time-slider that displays the maps produced over time on a base map of Switzerland (2) web-pages very neatly documenting map series, including their production processes (3) archiving system of digital-born geodata.

The Dutch Kadaster & National Mapping Agency (Nico Bakker) showed us their initiatives on (1) an elaborated and still growing museum of map production techniques (2) thorough inventories on the (history of) map production techniques in all its aspects (See the Dutch Kadaster Museum (<http://bit.ly/1DN1TSR>)) (3) their co-operation with the popular Geo-Fortress museum (4) plans to organize a meeting on map production techniques in the autumn of 2015.

Ghent University (Philippe De Maeyer) recently inherited the international Wright-Draper collection of instruments used in geographical production processes, comprising hundreds of items and descriptions from the last century. Together with the NGI (Belgium) they continue their efforts to digitize instruments and documents from the NGI and replay and record geographical production processes with old instruments and (retired) staff from the department concerned and the documentation department.

The National Geographic Institute (Rink Kruk) demonstrated their innovative geo-portal that takes away the barriers for accessing the largest old map collections on Belgium and Central Africa, using modern GIS-technology, adapted for use by the general public, to find and access old maps in archives, library and museum collections.

France (IGN France) and Germany (several Länder) built a few websites that document certain parts of the production processes documentaries in youtube-style format.



## 8 CONCLUSIONS

One of the initiatives that is brought forward by our group is to bring online existing standard glossaries-of-terms. Several excellent glossaries that well-document the production processes in terms of “terms” have been published before on paper. Our objective is to verify if such glossaries-of-terms could be brought online in cooperation with the publishers of these glossaries (e.g. ICA (several exists Dutch/English/French, German/French/Spanish, FIG, Swisstopo (French), ...).

One common standard to describe the map production objects is needed in order to bring our mutual heritage together and make it mutually accessible. Options to consider are the Nordic standard, the Dutch example, SIDOC-CRM (Standard from archeology), the standard from the Belgian Royal Military Academy, or a combination of best practices.

National Mapping Agencies should be encouraged to pick up the line, as information is lost rapidly these days and the importance of well-documenting production processes is taken seriously by only a few mapping agencies nowadays. A possible ways to push it forward would be the draft of a EuroSDR whitepaper, communications through closely related organizations such as EuroGeographics, ICA, FIG. More serious attention to the issue of archiving production techniques would solve one of our biggest issues up-till-now: the availability of qualified staff to document the production techniques and make it accessible.

## 9 ONGOING WORK

Inherent to the project, new initiatives were taken up in parallel on the preservation of the geographical production process, including

- a cooperation between the University of Gent and the National Mapping Agency of Belgium that digitized and inventoried documentation and objects, and documented working processes by replaying and recording old working processes
- ongoing work on a standard to describe witnesses (items, objects, ...) of the geographical production process by the Royal Military Academy of Belgium, UGent, and the NGI-Belgium with the aim to develop a standard that could suit international cooperation
- the inheritance by the UGent from Alan Wright of his extensive collection of survey instruments. This collection outlines the important innovations in the geodetic instruments after WWII, and is also a reflection of a remarkable life in service of science.
- a refined and reworked standard from the Royal Military Academy for the description of objects and documentation that could be potentially used as starting point for a European, collaborative database. The ‘digestion’ of the aforementioned, inherited collection has a severe impact on the availability on personnel for the work on the standard and database-design. However, it is probable that that work will be continued once the collection has been sorted out, with the advantage that the investment in a new inventory will also contribute to a consolidated standard and catalogue
- an exhibition in the Royal Palace in Brussels in the Summer of 2016, inaugurated by the King and Queen of Belgium, about the history of the map and the production processes behind it
- an exhibition (2017) titled “Pushing the Boundaries” on the Wright-Draper collection of geodetic instruments in the Science Museum of Gent University