



eContentPlus

European Commission · Information Society and Media Directorate-General

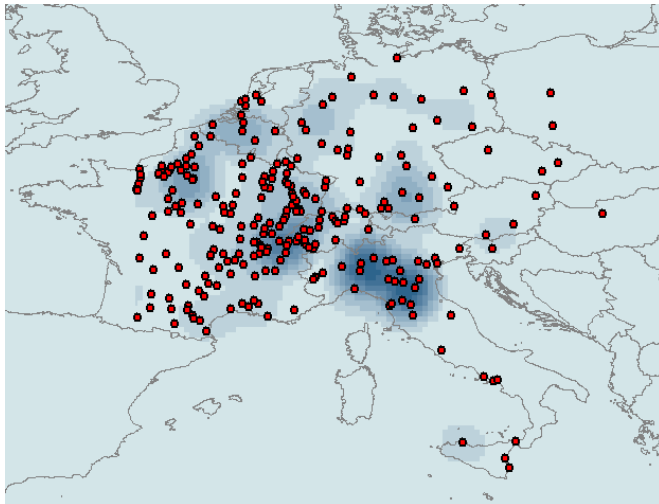


BERNSTEIN – THE MEMORY OF PAPER

Collaborative systems for paper expertise and history

ECP-2005-CULT-038097/Bernstein · <http://www.bernstein.oeaw.ac.at>

## Deliverable no. 28, ref. 4.5, Historical paper cartography tool



Map showing the locations to which the 19th century filigranologist Charles-Moise Briquet travelled to record watermarks (red dots) and how much time he spent there (shades of blue). Online at <http://bernstein.viskom.oeaw.ac.at/atlas/default.aspx>.

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# 1. What is the Bernstein Atlas?

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The Bernstein Atlas is a geographical information system for the study of paper and watermarks history. In particular it allows the following applications:

1. *visualization of spatial distributions* of papers and watermarks of the Bernstein databases and beyond;
2. *statistical analysis* of the spatial distributions;
3. *comparisons* between datasets;
4. *contextualization* of paper & watermarks history in regard to economical, cultural, political, etc. histories;
5. *theoretical reflection* on how to interpret the available historical data;
6. *link* from maps to a dedicated *paper bibliography* database;
7. *webservice* open to non-Bernstein datasets.

## *Access the Atlas*

Dynamic maps > [http://bernstein.iicm.tugraz.at:8080/BernsteinPortal\\_new/appl\\_start.disp](http://bernstein.iicm.tugraz.at:8080/BernsteinPortal_new/appl_start.disp) > Search > Map > Show Results

Static maps > <http://bernstein.viskom.oeaw.ac.at/atlas/default.aspx>

Documentation > <http://www.bernstein.oeaw.ac.at/twiki/bin/view/Main/GisServices> > Data > Dalek > Documentation

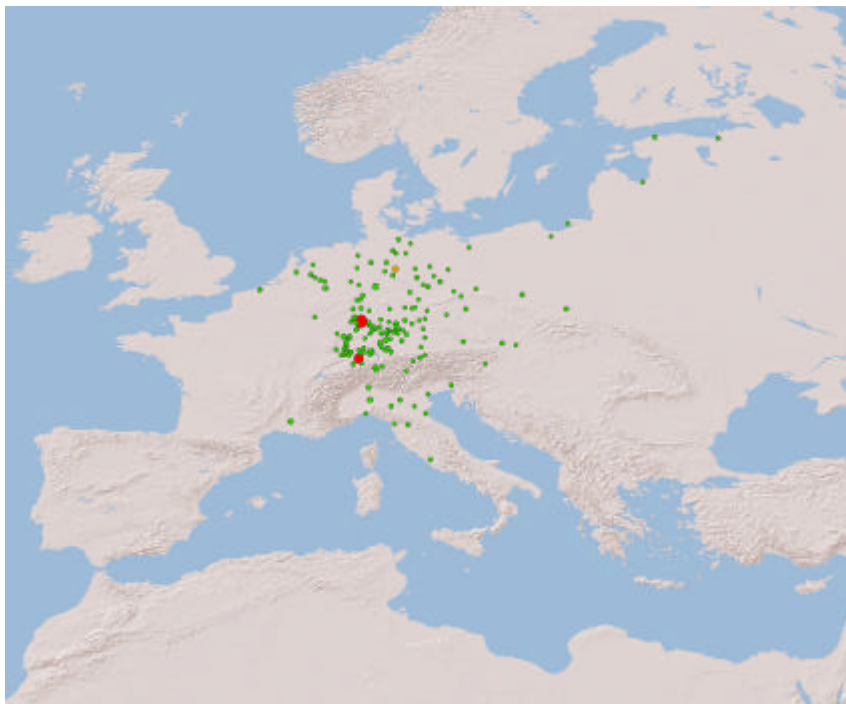
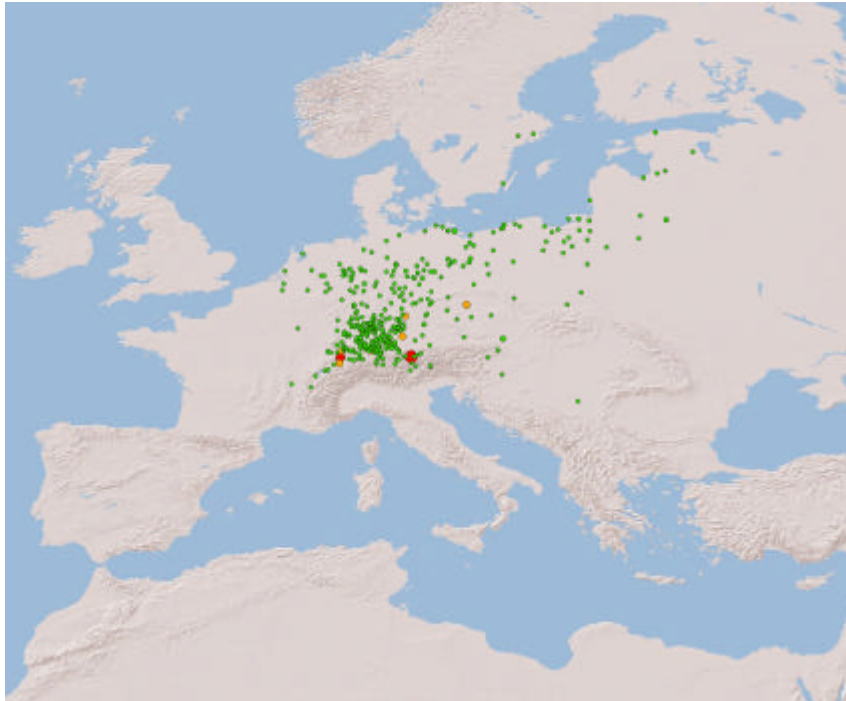
## 2. Maps examples

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### 2.1 Comparing watermark distributions

*Data* – Distribution for useplaces of watermark motifs “bear” (**top**) and “lion” (**bottom**).

*Discussion* – These maps reveal potential cultural preferences: bears are much used symbols in Transalpine Europe and Alpine areas (note the orange dot on Bern), while in Italy there are lions (green dot on Venice). It is interesting to note that regional preferences for these two animals are well documented in heraldry. The new knowledge that paper studies brings is that these cultural preferences had an economic impact: papers with different watermarks had also different markets.

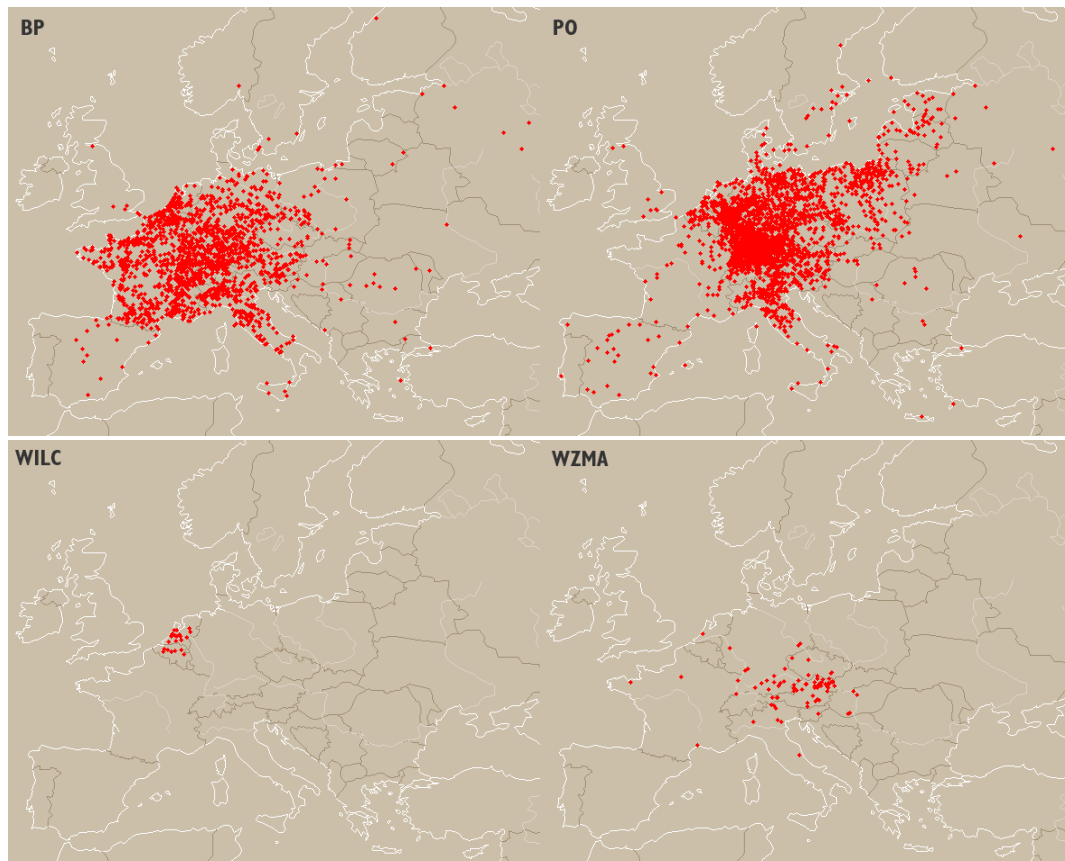


(Maps produced with the Bernstein Atlas for dynamic data.)

## 2.2 Interpreting distributions

*Data* – Global watermark useplaces distribution in Bernstein databases: Briquet (**top-left**), Piccard Online (**top-right**), WILC (**bottom-left**) and WZMA (**bottom-right**).

*Discussion* – The difference of distributions between databases is clearly visible in these maps and Bernstein inherits these particularities. When interpreting any subsample – such as the bear and the lion watermarks on the previous page – its meaning should be sought only in regard to the reference distribution. The interpretations are valid only in those areas covered by Bernstein. Because Bernstein doesn't show any bears in Spain, it doesn't mean that there are none – it's just that Bernstein doesn't know about it yet.

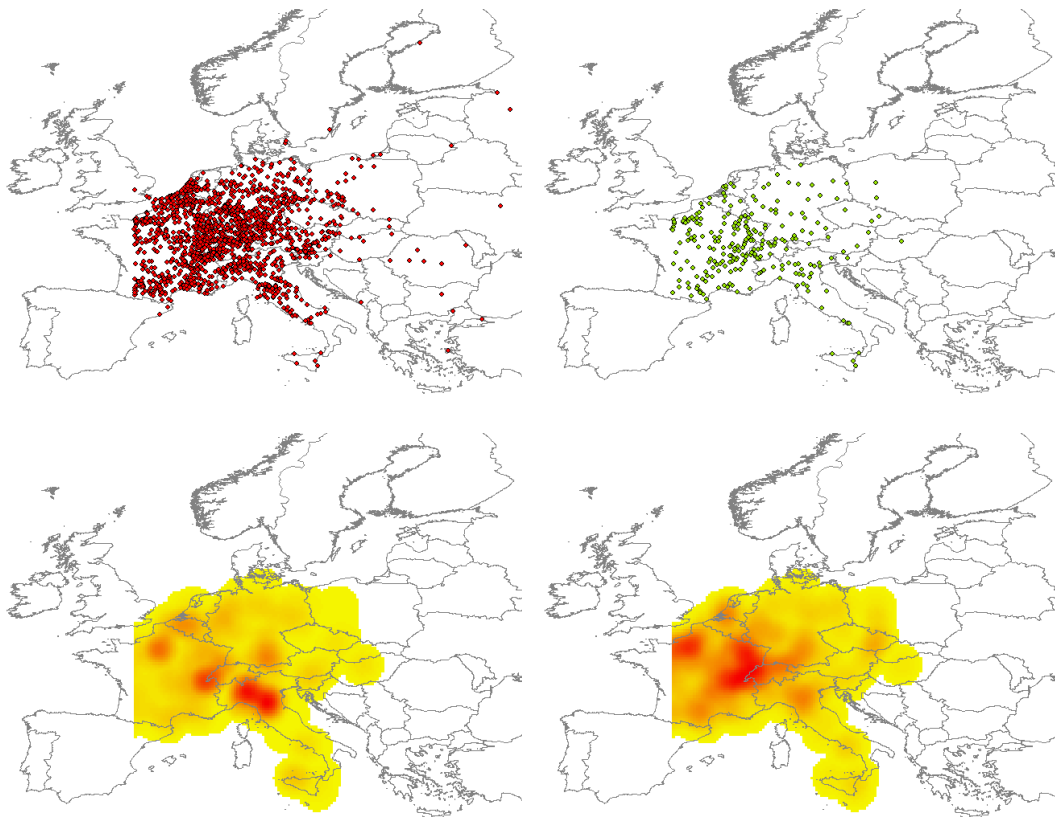


(Maps produced with the Bernstein Wiz software for the visualization of georeferences.)

## 2.3 Understanding distributions

*Data* – **Top-left:** Watermarks useplaces in the Briquet database. **Top-right:** Libraries and archives where Charles-Moïse Briquet (1839–1918) travelled to record watermarks. **Bottom-left:** Amount of time spent by Briquet in different areas based on the quantity of watermarks recorded in each location. **Bottom-right:** Most travelled areas by Briquet as given by the density of points in the repertoires map.

*Discussion* – These maps nicely underline the process by which the distribution in a database takes shape: papers are used in various places, those that survive the deprecations of time are collected in libraries and archives, usually nearby their useplace, then a scholar decides which institutions s|he should visit and records some of them in an opus. The Bernstein databases are entirely depended on the various interests and motives that moved the respective cataloguers. Briquet for example, a wealthy industrialist and famous filigranologist from Genève, has mostly travelled the regions close to home – the Rhône and Upper-Rhenan valleys. But, judging by the time spend, he mostly enjoyed dwelling in Lombardy and Toscana. Thus comes that his fancy is still permeating hundred years later the kind of knowledge we have on watermarks. More about Briquet’s life and work at [http://www.bernstein.oeaw.ac.at/papers/briquet\\_bio.html](http://www.bernstein.oeaw.ac.at/papers/briquet_bio.html).



(Maps produced with the Bernstein Atlas for static data.)

### 3. Functionalities

1. *Mapping* – The Atlas is mapping localities and regions as *graphical symbols* – dots, crosses, squares – or *textual labels*. Textual labels are particularly useful for rendering historical regions, which have notoriously *fluctuating boundaries*.

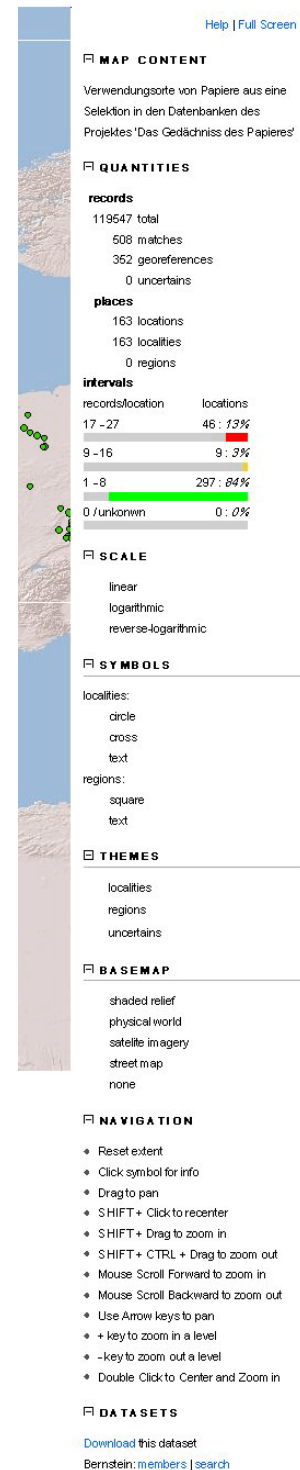
2. *Statistics* – Statistics are provided at three levels: [1] by the *size and color* of graphical location symbols, [2] by smoothed *density maps* of points, and [3] by *numerical summaries* on the displayed data.

3. *Layers* – The content to display can be manipulated in several ways. [1] The data can be *filtered* according to such attributes as locality/region, certain/uncertain localization. [2] In addition to data delivered by the Bernstein databases, *static datasets* generated by Bernstein and *external datasets* originating with third-parties can be mapped. [3] The displayed datasets can be *downloaded* for further processing by the user.

4. *Visualization* – The graphical *symbolology* of the maps, the type of *basemaps* and the *zooming/panning* can be modified.

5. *Language* – The user interface supports at the present time English, French, German, Italian and Spanish. Languages can be added as plug-in modules.

6. *Documentation* – The user interface, technology used and other aspects of the Atlas are explained in the accompanying documentation.



Help | Full Screen

**MAP CONTENT**  
Verwendungsorte von Papieren aus einer Selektion in den Datenbanken des Projektes 'Das Gedächtnis des Papiers'

**QUANTITIES**

**records**  
119547 total  
508 matches  
352 georeferences  
0 uncertain

**places**  
163 locations  
163 localities  
0 regions

**intervals**

records/location	locations
17 - 27	46 : 13%
9 - 16	9 : 3%
1 - 8	297 : 84%
0 /unkonwn	0 : 0%

**SCALE**  
linear  
logarithmic  
reverse-logarithmic

**SYMBOLS**

localities:  
circle  
cross  
text

regions:  
square  
text

**THEMES**  
localities  
regions  
uncertain

**BASEMAP**  
shaded relief  
physical world  
satellite imagery  
street map  
none

**NAVIGATION**

- Reset extent
- Click symbol for info
- Drag to pan
- SHIFT+ Click to recenter
- SHIFT+ Drag to zoom in
- SHIFT+ CTRL+ Drag to zoom out
- Mouse Scroll Forward to zoom in
- Mouse Scroll Backward to zoom out
- Use Arrow keys to pan
- + key to zoom in a level
- - key to zoom out a level
- Double Click to Center and Zoom in

**DATASETS**  
[Download this dataset](#)  
Bernstein: [members](#) | [search](#)

THE MEMORY OF PAPER

## 4. Impact

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It is expected that the Bernstein Atlas will have a significant impact on the study of paper and watermarks, as well as beyond, in the realm of Humanities.

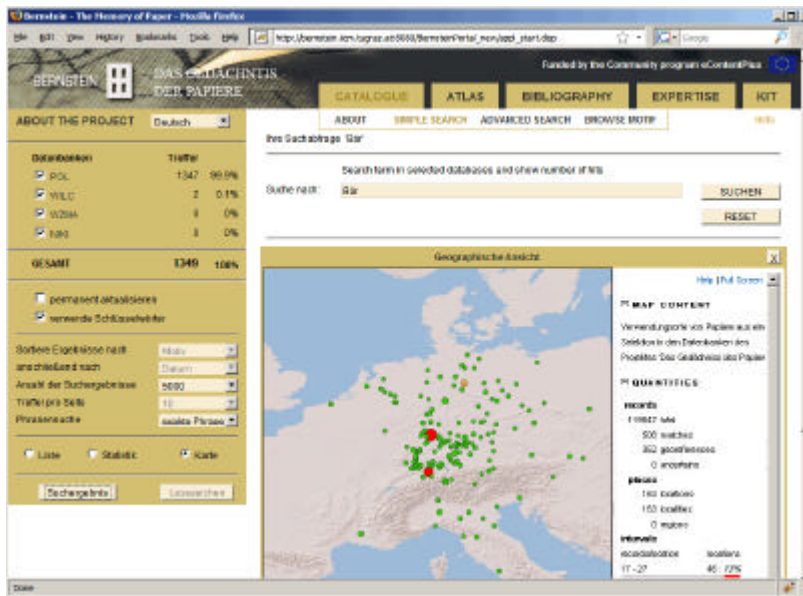
1. *Novel perspectives* – The Atlas promotes two rare yet powerful perspectives on paper and watermark history, that is the spatial and statistical approaches.
2. *Popularizing technologies* – It makes historical cartography and quantitative history easily doable to any interested individual by providing the necessary online technology and methodological description.
3. *Data assets* – It is supported by data that is both high in volume and represents reference material for paper and watermarks history: the Bernstein datasets.
4. *Open service* – It is open to use by third parties, which can map their own data.

## 5. Technology

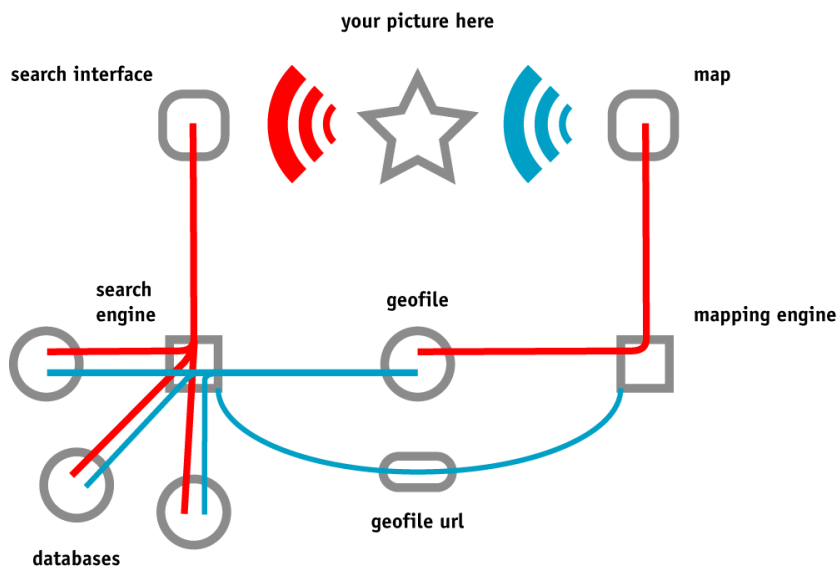
1. *Mapping engine* – The Bernstein Atlas mapping is based on the ArcGIS 9.3 software by ESRI, a world leader and successful standard setter for GIS applications. For the dynamic data generated through the workspace the Atlas uses Ajax technologies (JavaScript, HTML, CSS) as enabled by the ArcGIS JavaScript API. The density maps generated by the geoprocessor within the ArcGIS Webserver.

2. *Architecture* – Maps can be generated by the users via the search interface of the Bernstein website, by expressing search criteria and selecting the map as visualization method. The workspace gathers the appropriate data from the distributed databases, creates a file with geographical information, calls the Atlas webpage and hands via the URL the address of the geo-file. It is then the turn of the Atlas to read the given file and produce an online map. The user can then study the map and intervene through the Atlas interface on the contents and appearance of the map.

### The search/atlas integrated workspace.



### How the maps come to the users: software architecture.





3. *Data format* – The geo-file used to generate the map is formatted in a standardized JavaScript notation for objects and arrays, according to W3C schemas and RFC-4627 for JSON format. It incorporates Dublin Core metadata descriptors in a header to document its content.

**Insert – Excerpt of Bernstein geofile used to produce dynamic maps.**

```

datafeed(
{"header": {
  "content": {
    "title": "The members of Project Bernstein: The Memory
of Paper",
    "abstract": "The list of Project Bernstein members with
their respective contributions.",
    "subject": "history, paper studies, watermarks,
georeferences",
    "source": "Project Bernstein: The Memory of Paper",
    "creator": "Project Bernstein: The Memory of Paper",
    "publisher": "Project Bernstein: The Memory of Paper,
http://www.memoryofpaper.eu",
    "created": "2008.11.11 12:59:59",
    "rights": "Project Bernstein: The Memory of Paper,
http://www.memoryofpaper.eu"
  },
  "criteria": {
    "databases": "",
    "hits": "",
    "term": "",
    "motif": "",
    "dateStart": "",
    "dateEnd": "",
    "depository": "",
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    "measurementUnit": "",
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    "laidLinesUnit": "",
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    "useplaceStatus": ""
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    "nomenclature": "NUTS 2003"
  },
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  },
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},
"items": [
{
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  "placename": "Stuttgart",
  "latitude": "48.77",
  "longitude": "9.18",
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  "country": "Deutschland",
  "region1": "Baden-Württemberg",
  "region2": "Stuttgart",
  "region3": "Stuttgart, Stadtkreis",
  "region4": "",
  "records": "90000",
  "extra": "<a href='http://www.piccard-
online.de/'>Archives of the State of Baden-
Wuerttemberg</a>: data provider"
},
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  "placename": "Den Haag",
  "latitude": "52.08",
  "longitude": "4.30",
  "regionId": "NL332",
  "country": "Nederland",
  "region1": "West-Nederland",
  "region2": "Zuid-Holland",
  "region3": "Agglomeratie &#8217;s-Gravenhage",
  "region4": "",
  "records": "16000",
  "extra": "<a href='http://www.kb.nl/'>Koninklijke
Bibliotheek</a>: data provider"
},
{
  "status": "locality",
  "placename": "Wien",

```

## 6. Future

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The Atlas webservice developed by Bernstein opens vast perspectives for the visualization of cultures. At organizational level efforts have started to promote this topic through training events, collaborations, research and publications. A few of the technical development axes are new cartographic tools (representation of areas and networks, inclusion of the time dimension), optimization (map rendering speed, file sizes), cartographic visualization (more efficient information display, color schemes accommodation visual deficiencies), user involvement (for interface testing and identification of new needs), more pleasing designs.

## 7. References

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### *ArcGIS references*

JavaScript API > <http://resources.esri.com/arcgisserver/apis/javascript/arcgis/index.cfm?fa=home>

ESRI > <http://www.esri.com>

JSON format > <http://www.ietf.org/rfc/rfc4627.txt>

### *Related deliverables*

<http://www.bernstein.oeaw.ac.at/twiki/bin/view/Main/DocumentsArchive> > Deliverables

Georeferences datasets > Deliverable nr. 10, ref 2.2, GIS data batch no. 1; no. 27, ref. 2.6, Geographical & chronological metadata

Watermarks repertories > Deliverable nr. 26, ref. 2.7, Repertories concordances

Statistics > Deliverable no. 15, D4.4, Statistical functionalities

### *Image credits*

Maps & diagram – Vlad Atanasiu & Project Bernstein: The Memory of Paper, <http://www.memoryofpaper.eu>.

Watermarks (p. 5) & Briquet portrait (p. 7) – Hauptstaatsarchiv Baden-Württemberg, Stuttgart, project Piccard-Online, <http://www.piccard-online.de>.