Late Antique Epistolography:
Indexing and Mapping the Letters of Libanius

Libanius was a teacher of rhetoric during the fourth century AD whose school was in Antioch. He left behind an immense corpus composed of 64 orations, 51 declamations, 57 introductions to the speeches of Demosthenes, some school exercises and about 1544 letters. In the early 20th century, Richard Foerster made an edition of the whole of Libanius' work, which remains canonical to this day. After Foerster, editions and translations of the works of Libanius have been limited to a rather small number of cherry-picked orations and letters. While it is relatively simple to find your way through the orations (even if you have to consult more than 30 different editions/monographs to cover what has been worked on so far), the letters represent a more sizeable challenge, not only because there are about 1544 of them, but also because only about half of them have been edited or translated (with ample commentary[1]) since Foerster's canonical edition. To help scholars find their way through the corpus of letters, some scholars have made useful indexes for the letters on which they have worked. I believe this can be taken a step further.

In the context of this class, I plan to build the foundation of a database that would store metadata associated with the letters of Libanius. In addition to the creation of a solid architecture that would allow the database to be further expanded in the future, notably to include the actual text of the letters and even, ultimately, the other works of Libanius, I plan to collate the metadata of 100 letters (about 6.5% of the letters) and enter it in the database in order to demonstrate the efficiency of the data structure. Moreover, I plan to develop maps in Basemap and Folium in order to further show the capabilities of the database.

Over the course of the past few weeks, I was able to achieve all these goals and even some additional goals that arose along the way. The the database is composed of 8 tables, 7 of which I made myself specifically for the letters of Libanius and the last one contains the geographical information stored on the Pleiades GIS. The structure was made to respect the three levels of normalization as stated in the DatabasePrimer. A simple schema of the database can be found here. The main table, called the "Letter Table", contains all the basic information about each letter (Letter_ ID, Date_Min, Date_Max, Destination_ID, Recipient_ID, Carrier_ID). It is then connected with a many-to-one relationship with both the "Recipient Table" and the "Carrier Table" that both contain prosopographical information about the recipients and the carriers of the letters respectively (Recipient/Carrier_ID, Recipient/Carrier_Name, PLRE_ID, BLZG_ID[2]). The main table is also connected with a many-to-one relationship with the "Destination Table" that

[1] Instead of making new editions of the letters, most scholars who have worked on them in recent years have limited themselves to making translations, but with very detailed commentaries for each letter, often rivalling the length of the letter itself.

[2] The two prosopographical works used are the *Prosopography of the Later Roman Empire*, by A.H.M Jones *et al.* (Cambridge University Press, 1971) and Otto Seeck's *Briefe des Libanius zeitlich geordnet* (J. C. Hinrichs, 1906).

contains the necessary information (Destination_ID, Destination_Type, Pleiade_ID) for the mapping of the letters through python, with the exception of the latitudes and longitudes which are obtained through a one-to-one relationship between the "Destination Table" and the "Pleiades Table". The main table is further connected with the "Translation Table" through a one-to-one relationship, which contains the numbers that each editor and/or translator gave to the letters in their own editions and/or translations (Letter_ID, Norman_1992, Cabouret_2000, Bradbury_2004, Cribiore_2007). Finally, the main table is connected with a many-to-many relationship to the "Type Table", which contains all the information necessary to create a typology of the letters (Type_ID, Type_Name, Type_Definition), with the help of the "Mapping Table[3]" which acts as an intermediate between the two. This allows letters to have more than one type each. The creation of a typology is one of the goals that came up as I was creating the database. The typology that I have created is tentative and will definitely be refined as I read more letters, since the creation of a classification that would be understood and approved by a large number of people is an incredibly difficult exercise (perhaps even an exercise in futility). However, even this tentative typology makes the letter more easily searchable for people interested in a specific type of content.

This data structure allows for some interesting queries. I have listed seven such queries in an IPython notebook (cells 2 through 8) that illustrate the kind of information that users can retrieve from the database. Ultimately, I would like to create an interface that would allow users to retrieve this data through more familiar and universally understandable means, but this will be done later. These queries show all the relevant information of all the letters according to either a specific date, a specific geographical area, a specific recipient or carrier, or a specific type. Cells 3 and 8 also show that for any query, users can obtain either the different types associated with each letter or which scholar has worked on those letters. The translation information could potentially be included in any query, but was put separately to limit the amount of information given at once, while the types can only be displayed through a different query, since one letter can have more than one type.

The mapping of the letters of Libanius, originally conceived as a mere by-product of the database, quickly became the focus of my efforts during this semester, since it required a lot more autodidactic learning than the actual creation of the database and entering the data. I have made 3 maps for which the code is displayed in the same IPython notebook (cells 9 through 11). They all show the spatial distribution of the letters of Libanius in different ways. The main difficulty while creating these map was how to illustrate that the precise destination of several letters is unknown and that we merely know in which province they went. The first map uses Basemap, which produces a still image. Cities are represented with circles, while provinces are represented by squares. The name of the destinations along with the number of letters sent to that destination are plotted alongside the markers. However, the use of a small square to represent a

[3] Patrick Burns mentioned to me that this type of table is also called a "lookup table" in some circles. This table associates the Letter_ID with the Type_ID for all letters.

rather vast region is problematic for anyone not familiar with the layout of the Roman provinces during the life of Libanius. While trying to find the geographical data for the contours of the Roman provinces in the late fourth century, I realized that the data did not exist. This led to the inclusion of a new goal for this project: the creation of georeferenced polygons for all the Roman provinces where Libanius sent his letters. I chose to group divided provinces (such as Palestina Prima, Palestina Secunda and Palestina Salutaris) into one polygon for clarity and since it is not clear where the letters actually went. A GeoJson file containing those polygons can be found here. Since a still image created with Basemap might become too crowded and difficult to read if I were to add those polygons on the map, I decided to use those polygons only in Folium, which quickly became my main mapping tool. The first Folium map follows the exact same colour-scheme as the previous Basemap map, but the circles have been replaced with pinpoint markers, while the squares have been replaced by question mark markers. For every question mark marker, the province is drawn around it with the same colour. The second Folium map utilizes the choropleth function, which colours the polygons according to colorbrewer's colour schemes. Given the limitations in terms of the different colours that a Folium marker can have, the markers still use the same colour scheme as the other maps.

Related projects

As a database containing metadata about ancient documents, my project can be added to a pretty hefty list of similar projects. Here is a quick list of such projects:

- Trismegistos
  - Conceived initially as a database of published metadata concerning papyrological documents from Graeco-Roman Egypt, the project has since then evolved and expanded the types of documents and the temporal scope of the project.
- APIS
  - Contains extensive metadata about a wide variety of papyri, ostraca, wooden tablets and inscriptions.
- Roman Inscriptions of Britain
  - Closer to my project in terms of scope, this project catalogues metadata about Roman inscriptions from Britain.
- Petrae
  - Contains the text with extensive metadata for a series of inscriptions on which scholars from the *Institut Ausonius* worked.

The immense size of Libanius' corpus has led to the creation of other online resources that attempt to make it more searchable and accessible to a wider audience. Here is a quick list of such projects and resources:

- Summary of the translations of Libanius' Orations
  - Simple pdf document prepared by Christine Lund Koch Greenlee, a graduate student at St Andrews University. This was the inspiration for the creation of my database.
- Libanius Translation Project
  - Collaborative project to translate the works (mainly the Declamations) of Libanius.
- Libanius-dev
  - A machine-corrected EpiDoc version of the works of Libanius.
  - Hosted by the Open Greek and Latin Project
  - Lieve Van Hoof (Ghent University) is working on this project in order to do a social network analysis of the letters of Libanius when all the data will be available.