

Books and Borrowing

Requirements for the public website

This document gives an overview of the required features of the public website for the Books and Borrowing project, including all facilities through which the project's data can be searched, browsed and viewed.

1. Quick search

A 'Quick Search' box will appear on every page of the website. It will support the same wildcards as discussed in the 'Search' in Section 3 below and will search the following fields:

- Author:
 - Forename
 - Surname
- Book Work:
 - Title
- Book Edition:
 - Title
 - Language
 - Publication place
 - ESTC
 - Format
 - Genre
- Book Holding:
 - Original title
 - Standardised title
- Borrower:
 - Forename
 - Surname
 - Settlement
 - Occupation
- Borrowing:
 - Transcription
 - Date of borrowing, which can either be a specific date (year, year and month, or year, month and day) or a range. Each date element must be divided by a slash and start and end dates must be divided by a dash. For example, 1751-1755 or 1751/06-1755/02 or 1751/06/10-1755/02/21. The start and end date may have different levels of accuracy, e.g. 1751-1755/02/21 will return all records from 1751 up to and including the 21st of February 1755.

Users will be able to search for a single word or phrase, which will then be matched against all of the above fields. For example, a search for 'Smith' will find all authors and borrowers with 'Smith' as a surname and all book titles that mention 'smith'. It should be noted that the search will return borrowing records, so for 'smith' the results will display all borrowing records for borrowers with surname 'Smith' plus all borrowing records for books with authors that have the surname 'Smith' and all borrowing records for books with 'smith' in their title. The results of a quick search will be displayed on the 'View Results' page as described in Section 4 below.

2. Browse Libraries

This page will present an overview of all of the libraries in the system and will be an access point for viewing data relating to a specific library. It will consist of the following:

1. General introductory text about the libraries
2. An interactive map showing the location of each library. Pressing on a library location will bring up a popup containing:
 - a. Library name
 - b. Location
 - c. Date of foundation
 - d. Type
 - e. Number of registers
 - f. Number of books
 - g. Number of borrowers
 - h. Number of borrowing records
 - i. A link to open the library's page
3. A tabular list of libraries, consisting of the same information as the map popups. The user will be able to reorder the list by any of the columns (e.g. to order the table by number of borrowing records)
4. An interactive stacked column chart with one year per column and total number of borrowing records on the Y-axis. Each column will feature a coloured section representing the total number of borrowings in that year for each library and it will be possible to highlight or hide one or more libraries. The chart will enable users to understand the coverage of borrowing records over the period, the relative size of the libraries and where there are gaps in the borrowing records. An example chart is as follows:

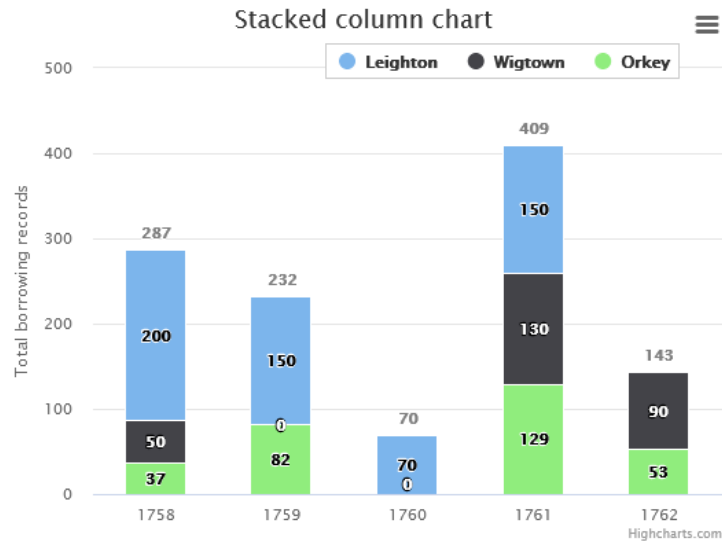


Figure 1: Stacked column chart showing borrowings across libraries over time

2.1 View Library

This page will contain information about a selected library, its books and borrowers. It will consist of the following sub-pages, most likely appearing as tabs:

2.1.1 Library introduction

This tab will feature:

1. An introduction to the library, featuring the data found in the library record as compiled in the CMS (e.g. name, name variants, settlement, address, descriptions)
2. An interactive map showing the location of the library and its proximity to other libraries. This will be the same map as discussed above, but the current library will be highlighted.
3. An interactive bar chart similar to the stacked column in Figure 1, but only featuring the current library, plotting the number of borrowings at the library across each year for which there are records. This will enable the user to easily spot where there are gaps in the record for the library. (Note: this should possibly be moved to the 'facts and figures' page – see 2.1.5 below)

2.1.2 Library registers

This will consist of a table of the library's registers, featuring the following columns. The user will be able to reorder the table by any of the columns:

1. A link to open the register (see 'View register' in Section 2.2 below)
2. The register's name
3. Start year
4. End year
5. Type
6. Description
7. Number of pages
8. Number of books
9. Number of borrowers
10. Number of borrowing records

2.1.3 Library books

The page will display a list of the library's book holding records, featuring:

1. Title
2. Author
3. A list of book items, together with counts of the number of times each item is borrowed
4. The catalogue URL for the holding record (if applicable)
5. Any additional fields for the book holding at this library, with a tooltip containing the additional field description
6. Information about the associated book edition and book work, with links through to the book edition / work entry on the browse books page (see Section 5 below)
7. The genre the book is part of
8. A count of the borrowing records the holding record appears in. This will appear as a link that when clicked on will open up a pop-up containing a list of associated borrowing records and links through to each specific record in the register (see 'View register page' in Section 2.3 below).

By default, the list will be ordered alphabetically by title, with books split across multiple pages with one page per initial letter and a list of relevant initial letters appearing as links at the top of the page, enabling the user to jump to books with titles beginning with the selected letter. It will also be possible to change the ordering to author surname, which will replace the alphabetical list by title to a similar alphabetical list by author surname. A 'view all' option will also be given, which will display all books (either by title or by author depending on which option is selected) in one long list rather than split over multiple pages. Finally, there will be a further option to list the books by number of borrowing records, which will display all books in one long list from most to least borrowed.

In addition, there will be two options to limit the display of book holding records. It will be possible to select a specific register to view only those books found in it and it will be possible to enter a year or range of years to view only those books that were borrowed in the selected period. Note that these limit options will be mutually exclusive.

There will also be an option to export the records as a CSV file. This will export the data that is currently displayed on the page, for example all book holding records with titles beginning with 'P', or all book holding records ordered by number of borrowings.

2.1.4 Library borrowers

This page will display a list of the library's borrowers, featuring:

1. Name (title, forename, surname, other titles)
2. Gender
3. Address (settlement, street)
4. Any cross references to other borrowers
5. Any additional fields for the borrowers at this library, with a tooltip containing the additional field description
6. A count of the borrowing records the borrower appears in. This will appear as a link that when clicked on will open up a pop-up containing a list of associated borrowing records and links through to each specific record in the register (see 'View register page' in Section 2.3 below).
7. Original occupation

8. Normalised occupation (the full hierarchy, e.g. 'Religion and Clergy > Minister/Priest > Church of Scotland')

The list of borrowers will be arranged alphabetically by surname, and as with the list of books, the borrowers will be split across multiple pages with one page per initial letter of the surname and a list of relevant initial letters appearing as links at the top of the page to enable the user to jump to borrowers with surnames beginning with the chosen letter. A 'view all' option will also be given, which will display all borrowers in one long list rather than split over multiple pages. Finally, there will be a further option to list the borrowers by number of borrowing records, which will display all borrowers in one long list from most to least prolific.

As with book holding records, it will be possible to limit borrowers to those referenced in a specific register or to those who borrowed a book in a particular period. There will also be an option to export the records as a CSV file, which will function in the same way as the book holding option.

2.1.5 Library facts and figures

This page will contain statistics and visualisations about the library's books, borrowers and records. This will not include any borrowing records that have been marked as excluded from the stats. The page will include the following:

1. The total number of books, authors, borrowers and borrowing records at the library
2. The average number of borrowings per borrower
3. The average number of times a book is borrowed
4. 'Top 10' lists, including the items and the number associated with them:
 1. Most borrowed books
 2. Most borrowed authors
 3. Most borrowed genres
 4. Most prolific borrowers
5. A summary of the gender of borrowers (if applicable):
 1. Percentage (and raw figures) of male / female / unknown
 2. Percentage (and raw figures) of borrowings by male / female / unknown
 3. 'Top 10' lists as above but broken down by gender.
6. A summary of the normalised occupations of all borrowers at the library, presented as a multi-hierarchical donut chart to enable the hierarchical nature of the normalised occupations to be visualised, for example:

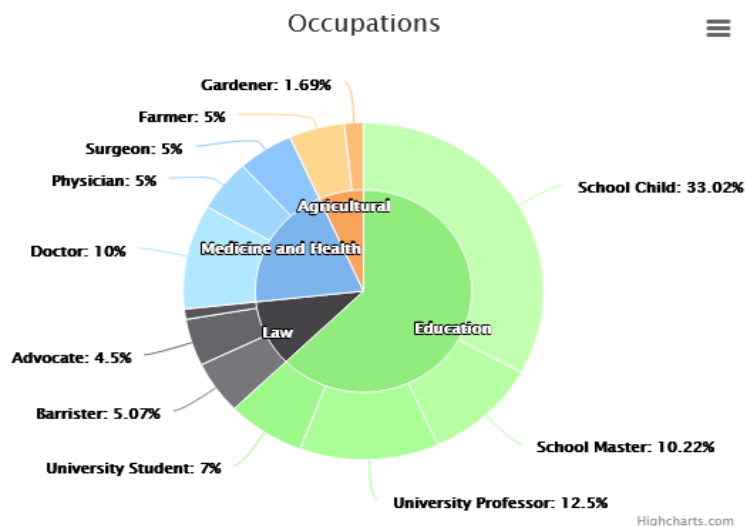


Figure 2: Borrower occupation donut chart

7. A summary of the number of borrowings per occupation presented using a further donut chart with the same colour scheme, to demonstrate which occupations borrowed the most (e.g. surgeons represent 5% of the borrowers but made 25% of the borrowings)
8. A summary of book genres at the library, represented as a pie chart showing percentages of total number of books
9. A summary of borrowings of each genre using the same pie chart and colour scheme, to demonstrate differences between the most common genres and the most popular genres (e.g. poetry represents 10% of books but 2% of borrowings)
10. A treemap showing each book's borrowings as a percentage of the total number of borrowings at the library, colour coded by genre, such as in the following example (with genres in place of continents):

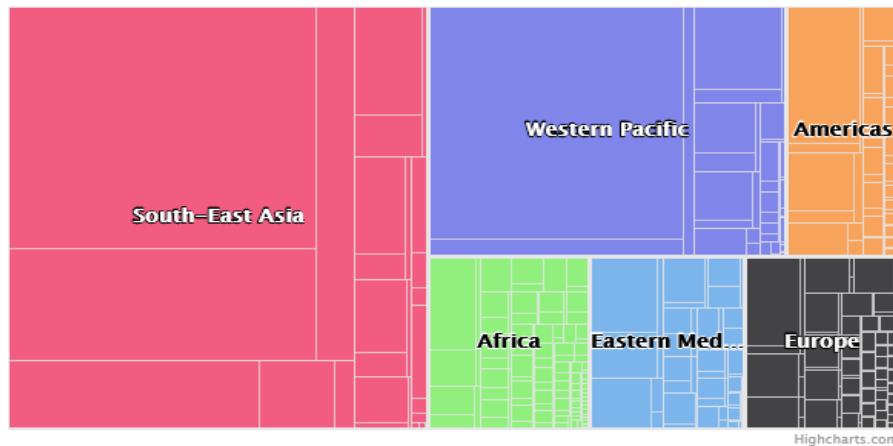


Figure 3: An example treemap

11. A stacked column chart similar to the one shown in Figure 1 above showing total borrowings per year at the library. An option will be given to divide the bars in the following ways:
 1. Book genre
 2. Borrower occupation

It will also be possible to click on a bar to expand the year into individual bars per month within the selected year.

12. A line chart through to which a user can add / remove one or more books to compare the frequency of borrowing records for each across the borrowing period, for example:

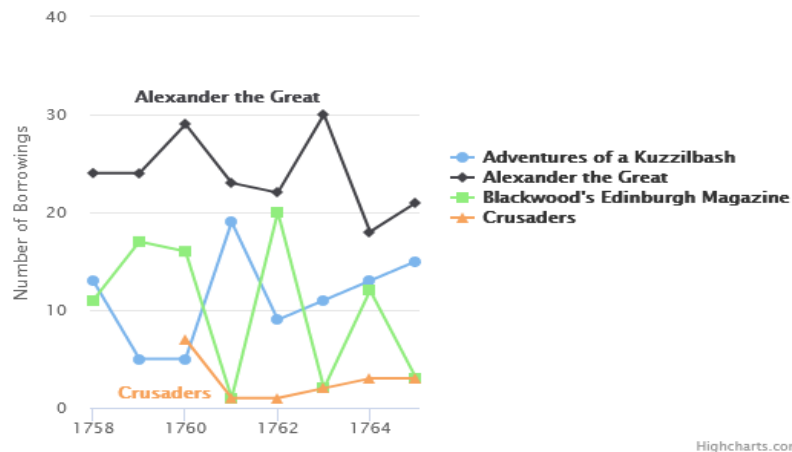


Figure 4: A line chart showing number of borrowings for four books

It will be possible to export each visualisation as an image file and also to access the raw data behind each visualisation as a CSV file.

2.2 View Register

When a register is selected from the list of registers as discussed in 2.1.2 above a page will load that lists all of the pages in the register. Each page will be displayed as a thumbnail image together with the folio number and a count of the number of records located on each page. Pressing on a thumbnail will open the register page. An option to download all of the page and borrowing records associated with the register as a CSV will also be offered.

2.3 View Register page

The view register page will contain all of the records found on a page, together with an image of the page that can be zoomed and panned. The page will consist of three tabs:

1. View text
2. View image
3. View both

When a register page is opened, either from the 'view register' page, via the search results or a browse method (such as the link through to borrowing records from the library borrowers page) the opened tab will be whichever tab the user last viewed, or 'View text' if no register page has yet been opened during the current session.

Above the tabs there will be navigation buttons for loading the next and previous page (as applicable), a drop-down list featuring all pages, enable the user to jump directly to a different page, and a button to return to the 'view register' page. If the page was loaded via the search results or a browse method a further link returning the user to the appropriate page will also appear.

2.3.1 View text

This tab will present all of the textual data relating to each of the records on the page. There is too much data to comfortably fit into a tabular layout and instead each record (listed in the order they appear on the page) will be given its own section of the page where all of the data relating to the borrowing record (e.g. the date borrowed, the transcribed text), the borrower (e.g. name, gender, occupation) and the book (holding / item / edition / work and related authors) will appear.

Data that can be browsed via other parts of the site will appear as links leading to the search results for the item in question, for example:

1. Borrower (view all borrowing records for this borrower)
2. Occupation (view all borrowing records by people of this occupation)
3. Book holding record (view all borrowing records where this holding was borrowed)
4. Book item record (view all borrowing records where this specific item was borrowed)
5. Book edition / work (view list of all borrowing records across all libraries where this edition / work was borrowed)
6. Author (view all borrowing records across all libraries involving this author)
7. Date of borrowing (view all borrowing records across all libraries on this day or month)

Any additional fields for the library's data will also appear on this page, as will links out to external sites such as ESTC. Such links will open in a new tab. An option to download all of the borrowing records on the page as a CSV will also be offered.

2.3.2 View image

This tab will present a high-resolution version of the digitised page image in a JavaScript viewer such as OpenLayers that will enable the user to zoom in and out of the image, pan around the image and view the image full screen. An option to download the image will also be offered.

2.3.3 View both

The tab will present both the textual data and the image viewer side by side, thus making it easier to cross-reference. While it will be accessible on all devices, this view is primarily intended for users viewing the page on a large monitor; on smaller screens the text and image view will be stacked vertically.

3. Search

The search page will enable users to construct their own queries in order to return a list of matching borrowing records, either focussing on one type of data (e.g. borrowers) or combining multiple types of data. Any field where free text can be entered will match the term anywhere within the form by default. It will also support the use of the following wildcards:

- An asterisk to match forms beginning with (e.g. term*), ending with (e.g. *term) or found in the middle of (e.g. *term*) the search term.
- An underscore to match any one character (e.g. h_ll will match 'hall' and 'hill')
- Double quotes to perform an exact match for the term

The page will feature two views: a 'simple' search with a more limited selection of fields and an 'advanced' search with an expanded selection of fields. The available search boxes are listed below. Any combination of boxes may be selected, and each box that is selected will be joined in the search by Boolean 'AND' – i.e. the more options that are selected the narrower the results will be. Any search box that allows multiple selections will be joined internally by Boolean 'OR' then joined to other search boxes by Boolean 'AND'. For example, if two libraries are selected and the year 1790 is entered the resulting search would return borrowing records that match "(Library A OR Library B) AND borrowed in 1790".

Users will be able to use a combination of the available search options to perform detailed or broad searches of the records available. It should be noted that in many cases combining different search options may yield no results, and to make it clearer how effective a search may be the number of borrowing records matching each entered search option will be displayed beside the search option, with a count of borrowing records matching the combined search options appearing alongside the 'Search' button. This approach is similar to the ESTC advanced search (see for example <https://tinyurl.com/ESTC-example>) but the figures will be calculated automatically as the user selects search options rather than requiring a button press to generate. However, it should be noted that this approach will be highly resource intensive as many queries will need to be processed to generate the figures as the user completes the form and this feature may need to be disabled if it affects the performance of the site.

3.1 Simple Search fields

Library:

1. A multi-select list of library names enabling any number of libraries to be included or excluded. A 'select all' option will also be included and will be the default selection. Where

two or more individual libraries have been selected these will be joined in the search with Boolean 'OR' – e.g. Leighton OR Haddington.

Borrowing:

1. Date of borrowing: featuring boxes for 'from' and 'to'. If a specific date is required the 'to' boxes should be left empty. Both 'from' and 'to' will consist of a box for entering a year, a drop-down list for selecting a month and a box for entering a day. 'Month' will only be selectable if 'year' has been filled in and 'day' will only be selected if 'month' has been selected. It will be possible to select just a year, just a year and month or year, month and day.

Author (authors associated with any level of book record will be searched):

1. Forename: free text
2. Surname: free text
3. Year of birth: free text accepting either a single year (YYYY) or a range (YYYY-YYYY). A negative year can be used for BCE dates
4. Year of death: free text accepting either a single year (YYYY) or a range (YYYY-YYYY). A negative year can be used for BCE dates

Book:

1. Title: free text. Will search book titles at work, edition and holding level
2. Genre: multi-select list containing all distinct genres in the system allowing one or more to be selected, joined with Boolean 'OR'

3.2 Advanced Search fields

Library:

2. A multi-select list of library names enabling any number of libraries to be included or excluded. A 'select all' option will also be included and will be the default selection. Where two or more individual libraries have been selected these will be joined in the search with Boolean 'OR' – e.g. Leighton OR Haddington.

Register:

1. This option will only be populated if one or more individual libraries have been selected. In such cases a list of all registers in the selected libraries will appear in a multi-select list. A 'select all' option will also be included and will be the default selection. Where two or more individual registers have been selected these will be joined in the search with Boolean 'OR' as above.

Borrowing:

2. Transcription: free text
3. Date of borrowing: featuring boxes for 'from' and 'to'. If a specific date is required the 'to' boxes should be left empty. Both 'from' and 'to' will consist of a box for entering a year, a drop-down list for selecting a month and a box for entering a day. 'Month' will only be selectable if 'year' has been filled in and 'day' will only be selected if 'month' has been

selected. It will be possible to select just a year, just a year and month or year, month and day.

Borrower:

1. Title: multi-select list containing all distinct borrower titles in the system allowing one or more to be selected, joined with Boolean 'OR' (e.g. Lord OR Lady)
2. Forename: free text
3. Surname: free text
4. Other name: free text
5. Occupation: A tree-based browser enabling one or more occupations at any hierarchical level to be selected. If a higher level in the hierarchy is selected or deselected (e.g. 'Animal Husband') then all occupations at a lower level will also be selected or deselected.
6. Settlement: An autocomplete field. As the user types, a list of matching settlements is displayed from which one can be selected
7. Street: An autocomplete field. As the user types, a list of matching streets is displayed from which one can be selected
8. Gender: A drop-down list containing 'Female', 'Male', 'Unclear' and 'Unknown' from which one can be selected

Author (authors associated with any level of book record will be searched):

5. Forename: free text
6. Surname: free text
7. Year of birth: free text accepting either a single year (YYYY) or a range (YYYY-YYYY). A negative year can be used for BCE dates
8. Year of death: free text accepting either a single year (YYYY) or a range (YYYY-YYYY). A negative year can be used for BCE dates

Book Work (help text will explain that book work is the top-level record for a book):

3. Title: free text
4. Publication date: free text accepting either a single year (YYYY) or a range (YYYY-YYYY)

Book Edition (help text will explain that book edition relates to a specific edition of a book work):

1. Title: free text
2. ESTC: An autocomplete field. As the user types an ESTC a list of possible matches will be displayed from which one can be selected
3. Language: multi-select list containing all distinct edition languages in the system allowing one or more to be selected, joined with Boolean 'OR'
4. Place of publication: An autocomplete field. As the user types a place a list of possible matches will be displayed from which one can be selected
5. Publication date: free text accepting either a single year (YYYY) or a range (YYYY-YYYY)
6. Format: A drop-down list from which one format may be selected
7. Editors: free text
8. Translators: free text
9. Genre: multi-select list containing all distinct genres in the system allowing one or more to be selected, joined with Boolean 'OR'

Book Holding (help text will explain that a book holding is a specific instance of an edition held at a specific library):

1. Title: free text (will search both the 'original title' and 'standardised title')

4. Search Results

The search results page will present the user with the borrowing records that match their search criteria and will be reached from either the quick search, the simple / advanced search or from links found in a variety of browse pages, for example when a borrower's listed occupation is clicked on from the text view of the 'view register' page as discussed in 2.3.1 above. When the page is reached from a quick search a 'Try a simple / advanced search' button will appear at the top of the page. When the page is reached from a browse there will be both a 'Try a simple / advanced search' button and a link back to whichever browse page the user navigated from. When the page is reached from a simple / advanced search there will be a button to refine the search and a button to try a new search. Pressing the former will load the simple / advanced search page with all previously entered terms remembered, enabling the user to customise their selection. Pressing the latter will clear the form.

Borrowing records that match the search criteria will be displayed in a similar manner to the text view of the 'view register' page as detailed in 2.3.1 above. In addition to the data mentioned in this section, each record will also feature its corresponding library, register and page details, each as links through to the relevant page. When the record's page link is pressed on this will load the register's page at the specific point where the record appears.

Unlike the text view of the 'view register' page, the search results will be paginated, with 100 results per page. 'Next' and 'Previous' results links will appear above and below the results, together with options to navigate directly to a specific page of results. In addition, there will be a facility to reorder the search results, which will include the following options:

1. By library, register and page (the default view)
2. By date borrowed
3. By borrower name
4. By borrower occupation
5. By author name
6. By book work / edition / holding title

5. Browse Books

This page will present an overview of all of the books in the system across all libraries. By default, it will list book edition records, presented alphabetically by title, with books split across multiple pages with one page per initial letter and a list of relevant initial letters appearing as links at the top of the page, enabling the user to jump to books with titles beginning with the selected letter. It will also be possible to change the ordering to author surname, which will replace the alphabetical list by title with a similar alphabetical list by author surname. It will also be possible to limit the list by genre, selecting one genre from a list of available genres. It will also be possible to limit the list by date of publication, either selecting an individual year or a range of years.

The list of book editions will include the following:

1. Title
2. Associated authors
3. ESTC
4. Other authority URL and type (if applicable)
5. Language
6. Place of publication

7. Date of publication
8. Format
9. Pagination
10. Editors
11. Translators
12. Number of associated borrowing records, which will appear as a link that when pressed on performs an advanced search for the book edition and displays the results
13. A list of associated book holdings, consisting of the library, the holding title, a link through to the external catalogue record (if applicable), a link through to the holding's page (see 2.1.3 above), the number of associated book items and the number of associated borrowing records, which will appear as a link that when pressed on performs an advanced search for the book holding and displays the results
14. Book work title
15. Book work publication date

Information in the above lists that appear on the advanced search page (e.g. ESTC) will appear as links that when clicked on perform a search for the item in question.

There will also be an option to export the records as a CSV file. This will export the data that is currently displayed on the page (e.g. all book work records with titles beginning with 'P' in genre 'History') and will contain the full edition and holding data for each book.

6. Browse Borrowers

This page will function in a similar manner to the library-specific borrowers page as mentioned in 2.1.4 above, but the data will also include the library the borrower is associated with. The limit options will also differ. It will be possible to limit the list of borrowers to those who borrowed a book in a particular period, borrowers who have a specified occupation, borrowers of a specified gender, and borrowers from a specified settlement.

7. Facts and Figures

This page will replicate the statistics and visualisations as found on the library-specific facts and figures page as discussed in Section 2.1.5 above but will default to using data from all libraries. In addition, the page will feature a multi-select box listing the libraries and enabling the user to select or deselect any of them. Doing so will update the statistics and visualisations, limiting them to data relating to the chosen libraries.

8. Chambers' Library Map of Borrowers, 1827-1830

This subproject will feature a map-based interface that will support the interpretation and dissemination of findings from the Chambers' Library project by visualising the geographic distribution of the library's 192 borrowers, primarily in Edinburgh's New Town.

The map viewer will be based on a geo-referenced version of John Ainslie, Edinburgh & Leith, 1804, provided by the NLS (currently available here: <https://geo.nls.uk/maps/books-and-borrowing/>). The Ainslie map will be overlaid on a basic modern map to catch the small number of borrowers located outside Edinburgh, similar to the approach taken in the Paul Jones map viewer: <https://regionalromanticism.glasgow.ac.uk/paul-jones/>.

On accessing the map, users will be presented with a brief introductory panel giving key information on the library and its context, and instructions on how to use the application. Geo-referenced pins will display the locations of borrowers and the library itself. The library pin and borrower pins will be

visually differentiated; borrower pins will also be differentiated (for example using different colours) based on the following attributes:

1. Occupation
2. Gender
3. Subscription type.

Users will be able to navigate the map by panning and zooming and an interface panel will provide filter controls and display information on selected pins. When the user zooms out the pins will form clusters to ensure the map is still readable, in a similar manner to this site:

<https://burnsc21.glasgow.ac.uk/supper-map/>. Selecting a pin will display the borrower name and address, along with any available biographical and membership information, and a list of related borrowers (e.g. family members). Users will also have the option to follow links through to register pages related to the selected borrower. Selecting the library pin will display basic background information on the library itself, and terms of subscription.

Users will be able to filter borrower pins according to the following attributes: gender, occupation, and borrower type (based on subscription information from the ledger). Additionally, it will be possible to limit the borrowers displayed on the map according to subscription dates: for example, selecting a date range of January 1828 – June 1829 would display the locations of only those borrowers who were paying subscribers during that period. Date range will be selectable via a double-headed date slider located in the interface panel.

It is intended that the subproject will launch before the rest of the online resource, therefore it will be relatively self-contained at the point of launch. It will not initially feature links out to the other parts of the interface described in this document, although such links will be added in once the main resource launches. This will include links to library and register pages and lists of books and borrowers.

9. Additional features

The following additional features will also be part of the online resource:

9.1 On this day

This feature will be added to the homepage and will dynamically load a random borrowing for the current day each time the user opens the page. If there is no borrowing for the current day then a borrowing from the current week will be returned instead, with a note stating this. The feature will list the library, borrower, book and author for the selected borrowing and will include two links. The first will lead the user to the register page containing the record, with the page focussed on the record. The second will lead the user to the search results showing all borrowing records for the current day (or week, if applicable).

9.2 Cite this view

Every page containing data will feature a URL that can be bookmarked and shared, leading to an exact view of the data as found on the page when the user copied the URL. Each data page will also feature a 'cite' option that will present a link to the current view of the data in three citation styles (APA, MLA and Chicago), plus a general citation for the whole resource in a similar manner to the 'cite this entry' option on this page: https://anglo-norman.net/entry/a_1

9.3 Download data as CSV

Wherever data is presented in the resource, either in search results, a browse page or in a visualisation, an option to download the raw data as a CSV file will also be offered to users, enabling

the data to be used and reused elsewhere. It will function in a similar manner to the 'Download data (CSV)' button on this page: https://berwickshire-placenames.glasgow.ac.uk/placenames/?p=results&source=browse&reels_name=A*#10/55.7650/-2.4094

9.4 API access

There will be a link from the public website to the project's API (see Section 10 below) that users will be able to access, either to query the data directly themselves or to connect their own scripts or systems to.

10. The API

The API (application programming interface) will be the access point to the project's data, accessible by the project's front-end, third-party programs and internet users. All of the queries that are required for the front-end to function will have an 'end point' in the API – a URL through which variables (e.g. a register ID) can be passed that return data (e.g. the pages of a register) when called. Data will be available in the JSON format (which is easily readable by scripts) and CSV format (more easily read by humans). The API will function in a similar manner to the one found here: <https://berwickshire-placenames.glasgow.ac.uk/api/v1/>