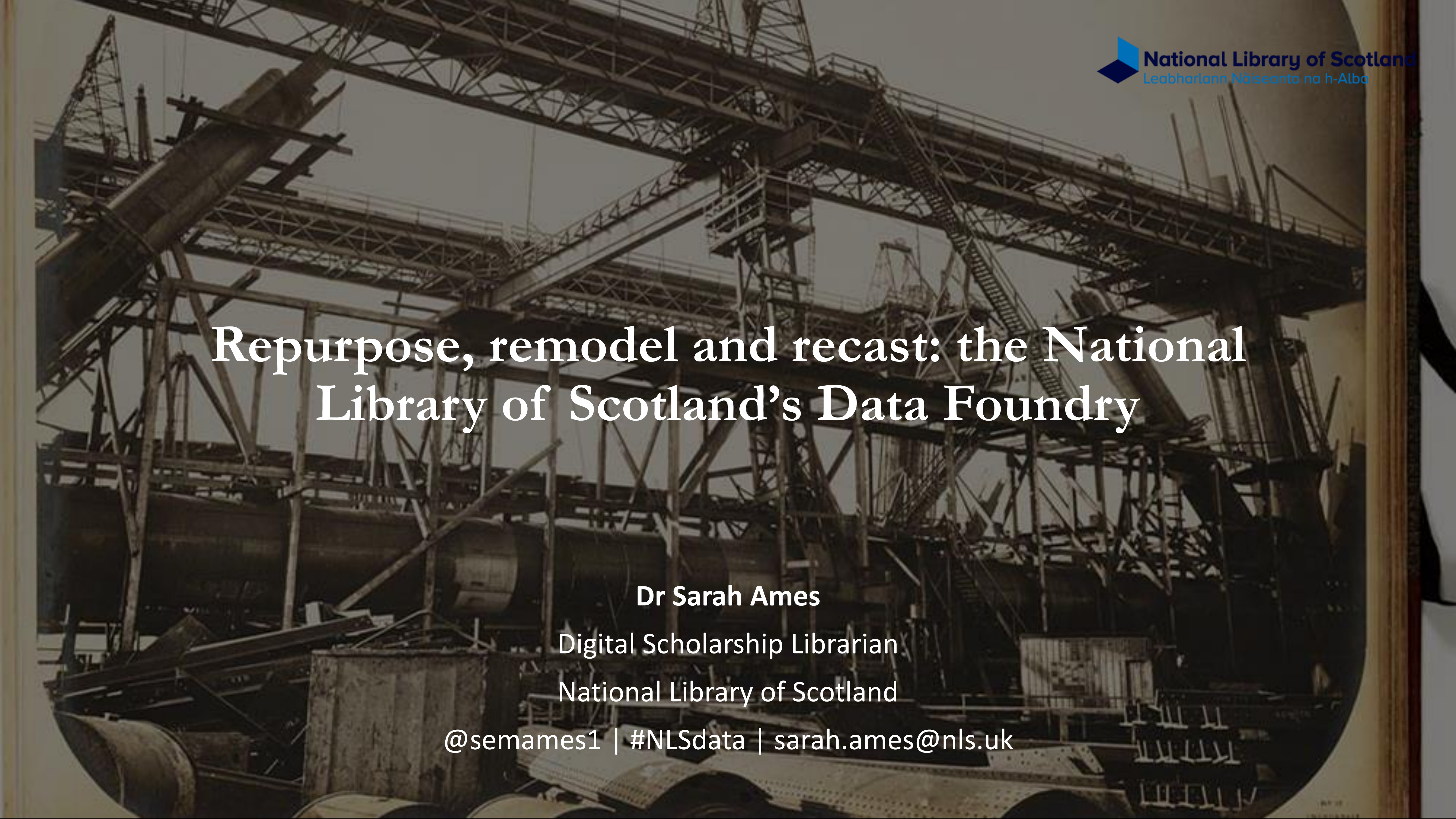

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Repurpose, remodel and recast: the National Library of Scotland's Data Foundry

Dr Sarah Ames

Digital Scholarship Librarian

National Library of Scotland

@semames1 | #NLSdata | sarah.ames@nls.uk

National Library of Scotland
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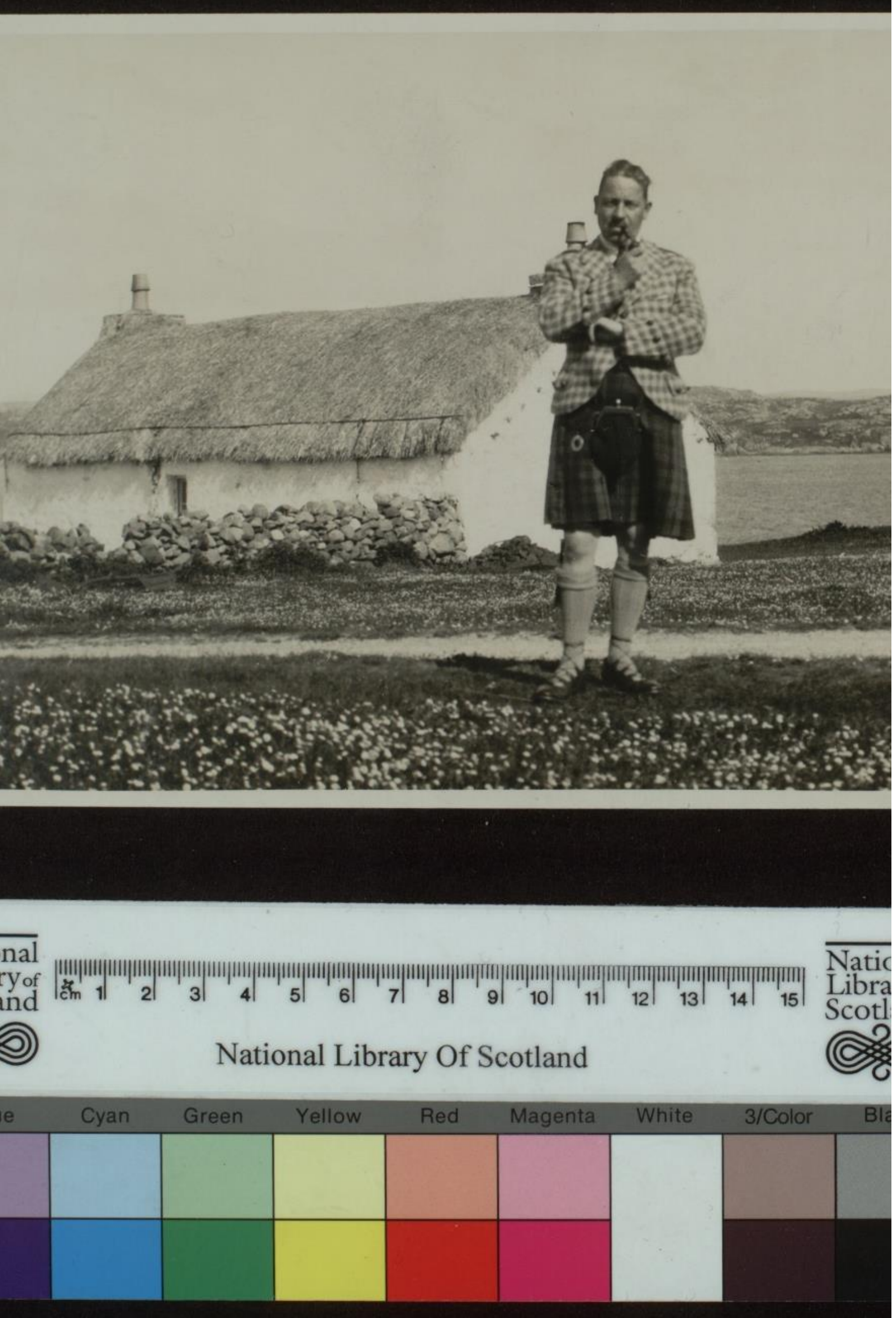
Today's talk

- Data Foundry and Digital Scholarship at NLS
- Engagement and collaborative activity and outcomes
- The way forward
- Challenges



The Scottish context

2015 Open Data Strategy, Scottish Government

2018 City Region Deal

- £1.3bn/15 years (government, universities, private & third sector)
- £60 million for data driven innovation
- Skills/Entrepreneurship/Growth

University of Edinburgh

- Bayes Institute
- Edinburgh Futures Institute
- Creative Informatics
- Centre for Data, Culture and Society

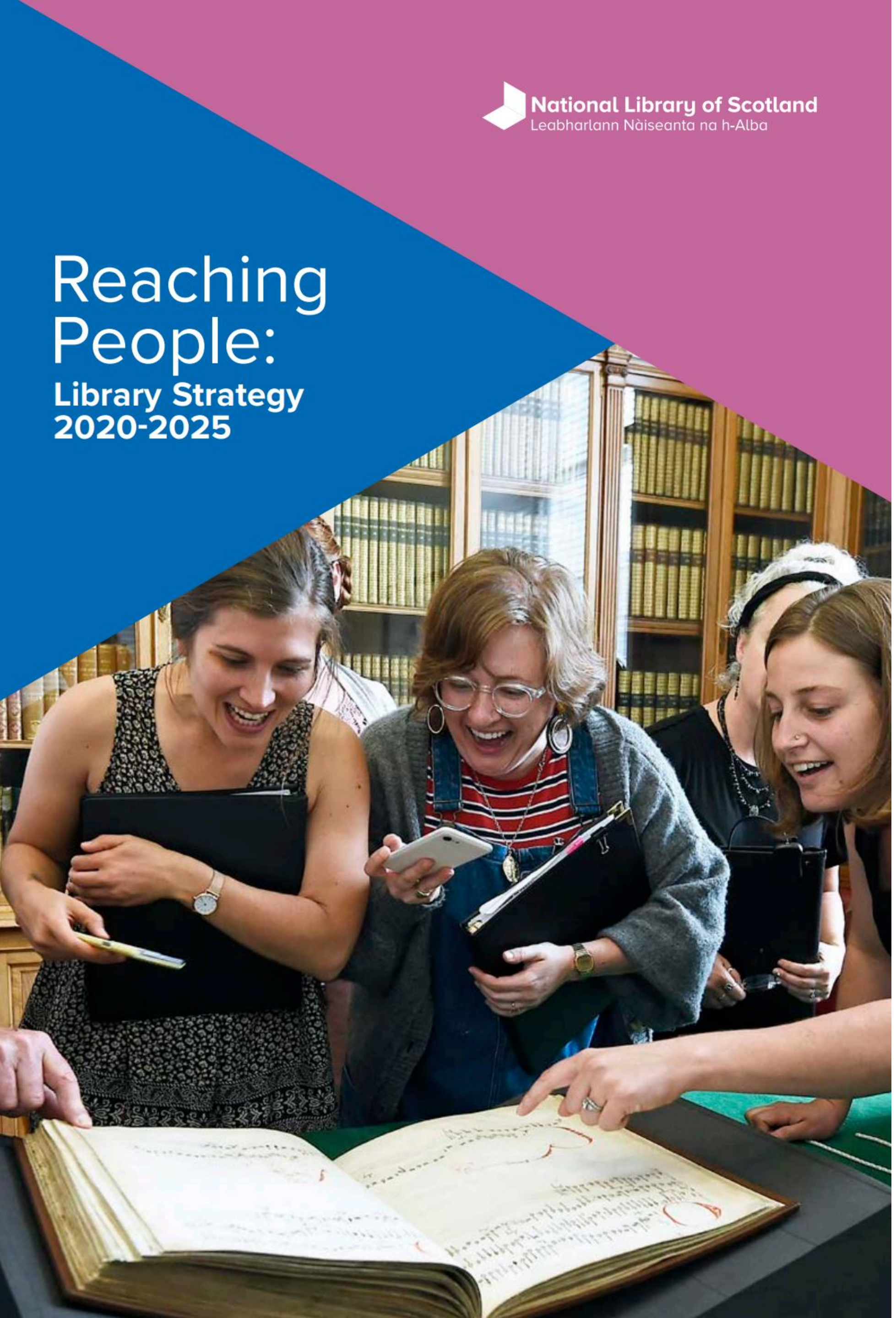
University of Glasgow

- Information Studies/Digital Humanities

Universities of Aberdeen, St Andrews, Stirling, Dundee

- Big data/data science

CodeBase/CodeClan



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Reaching People:
Library Strategy 2020-2025

National Library of Scotland
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The National Library of Scotland

Over 31 million items in collection (excluding web archive, and owned-in-perpetuity digital collections)

'One Third Digital' by 2025

In-house mass digitisation programme

Strategy 2020-2025, 'Reaching People': strong focus on engaging with new audiences through the collections

Digital Scholarship Service

ENCOURAGE, ENABLE & SUPPORT USE OF COMPUTATIONAL RESEARCH METHODS WITH THE COLLECTIONS

ENSURE THAT THE COLLECTIONS ARE USED TO THEIR FULL POTENTIAL

ESTABLISH A LIBRARY CULTURE WHICH UNDERSTANDS DIGITAL SCHOLARSHIP

PRACTISE AND PROMOTE TRANSPARENCY IN OUR DATA CREATION PROCESSES

ANTICIPATE THE FUTURE OF RESEARCH

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Data Foundry

No-nonsense data

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Identifying user needs

Pro	Intermediate	Beginner
All the tech skills! Will find a way to get the data no matter how presented But – has expectations of standards (where they exist) & consistency	Limited tech skills Understands value of different formats and approaches for research questions: theoretical rather than practical understanding Wants to get hold of the data easily to check what's there Likely to employ an RA to do the work	No tech skills Wants to use online tools to explore datasets Just wants the text

Plus broader audience includes other libraries (standards, presentation of data etc)

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Identifying user needs

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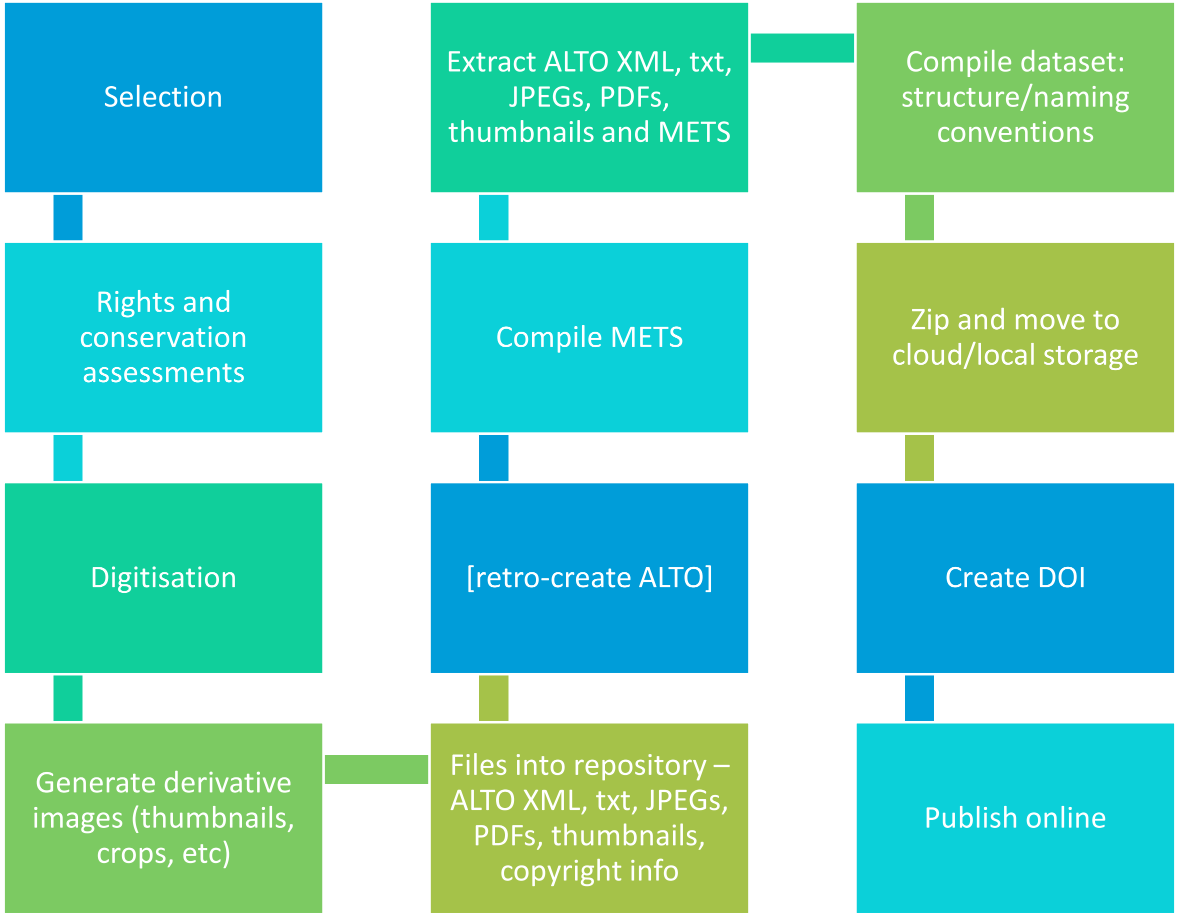
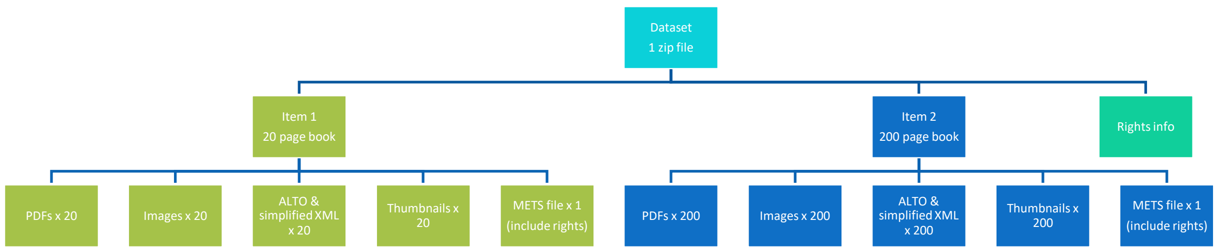
Changing processes: digitisation to data

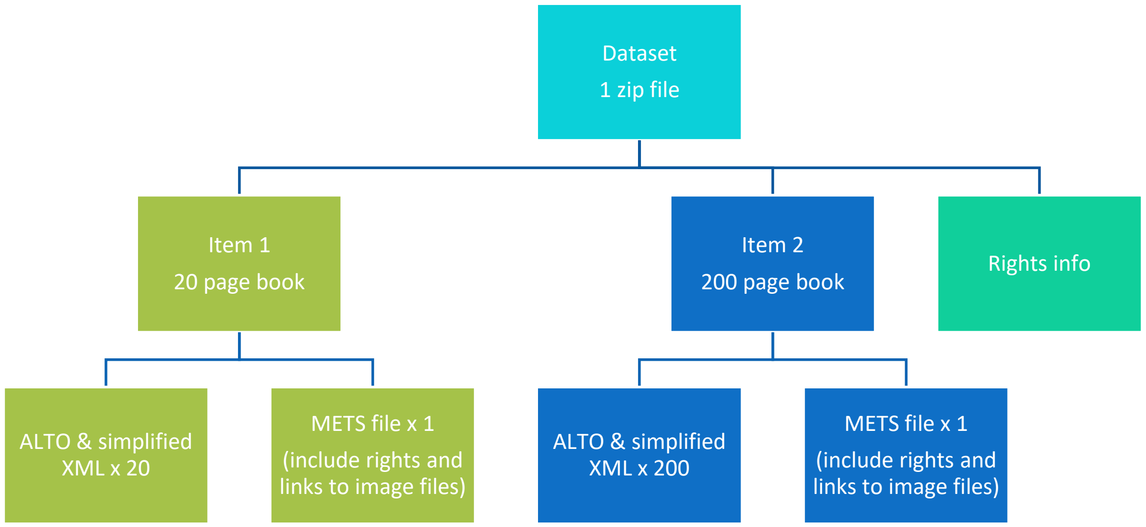

Selection
Rights and conservation assessments
Digitisation
Generate derivative images (thumbnails, crops, etc)
Files into repository – ALTO XML, txt, JPEGs, PDFs, thumbnails, copyright info
[retro-create ALTO]
Compile METS
Extract ALTO XML, txt, JPEGs, PDFs, thumbnails and METS
Compile dataset: structure/naming conventions
Zip and move to cloud/local storage
Create DOI
Publish online

A

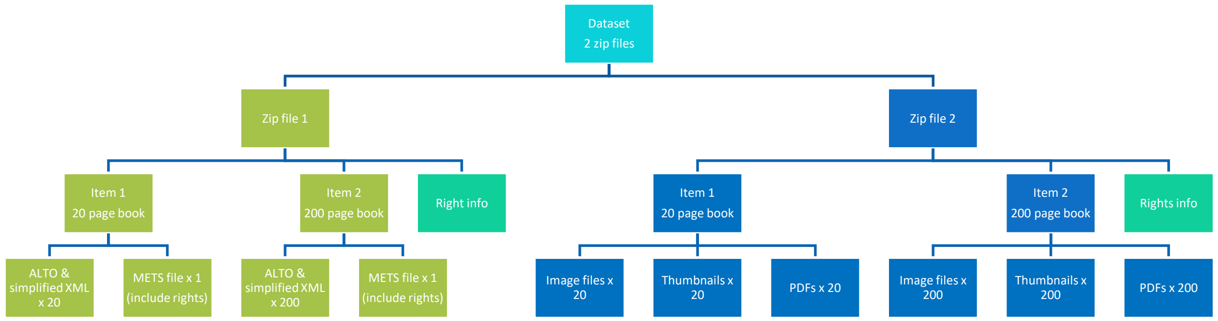

Dataset
1 zip file
Item 1
20 page book
Item 2
200 page book
Rights info
PDFs x 20
Images x 20
ALTO & simplified XML x 20
Thumbnails x 20
METS file x 1 (include rights)
PDFs x 200
Images x 200
ALTO & simplified XML x 200
Thumbnails x 200
METS file x 1 (include rights)

B

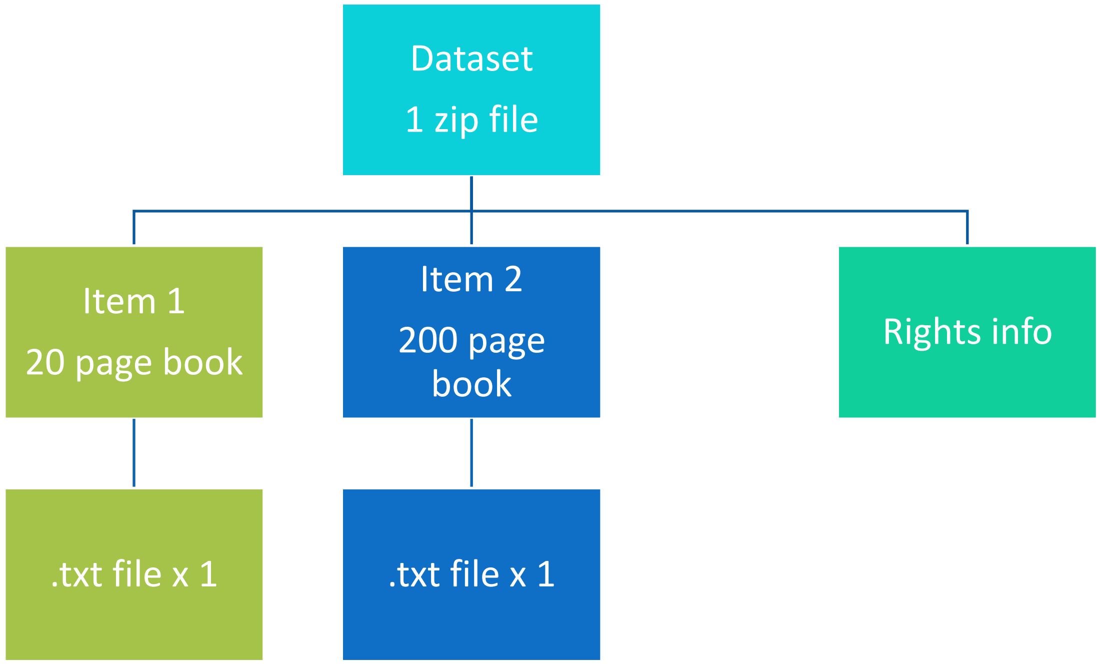
National Library of Scotland
Leabharlann Nàiseanta na h-Alba


Dataset
1 zip file
Item 1
20 page book
Item 2
200 page book
Rights info
ALTO & simplified XML x 20
METS file x 1
(include rights and links to image files)
ALTO & simplified XML x 200
METS file x 1
(include rights and links to image files)

C


Dataset
2 zip files
Zip file 1
Zip file 2
Item 1
20 page book
Item 2
200 page book
Right info
ALTO & simplified XML x 20
METS file x 1 (include rights)
ALTO & simplified XML x 200
METS file x 1 (include rights)
Item 1
20 page book
Item 2
200 page book
Rights info
Image files x 20
Thumbnails x 20
PDFs x 20
Image files x 200
Thumbnails x 200
PDFs x 200

D


Dataset
1 zip file
Item 1
20 page book
Item 2
200 page book
Rights info
.txt file x 1
.txt file x 1

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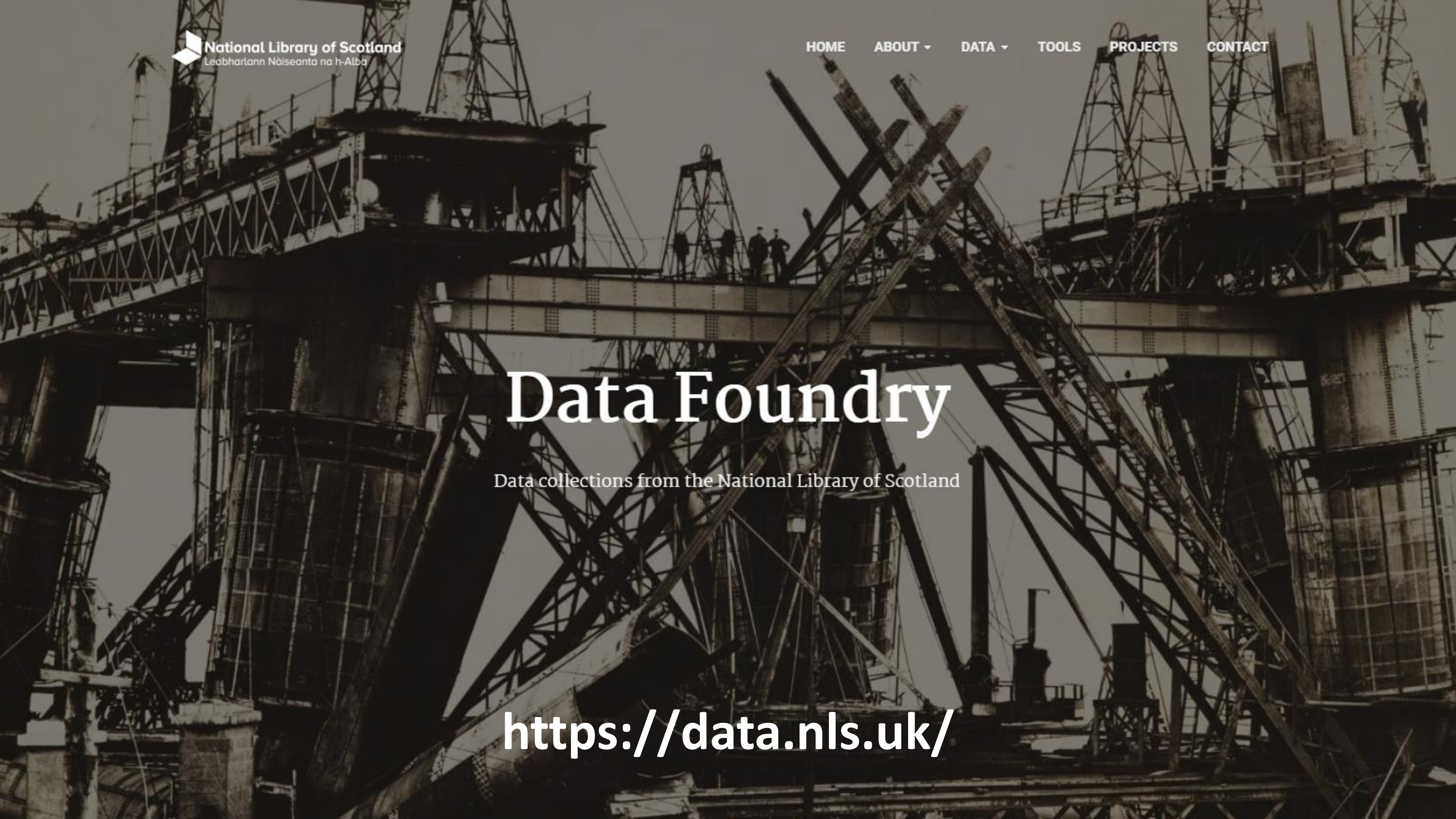
Making decisions

- Standards:
  - METS/ALTO and Plain text
  - MARC/Dublin Core
  - Tiered downloads
- Image sizes/quality to include
- Storage (local/cloud)
- What metadata to include and what is available
- How to be transparent: gathering and presenting dataset context
- Now moving on to more metadata collections, web archive data, spatial data

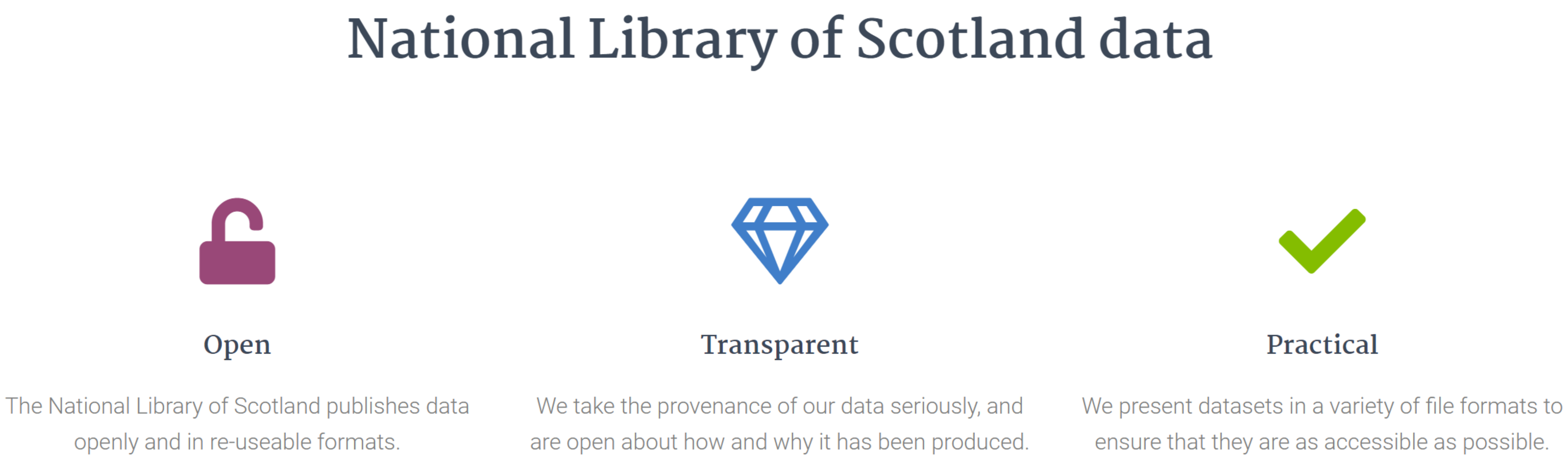


Data Foundry

Data collections from the National Library of Scotland

https://data.nls.uk/

Our principles



National Library of Scotland data

Open

The National Library of Scotland publishes data openly and in re-useable formats.

Transparent

We take the provenance of our data seriously, and are open about how and why it has been produced.

Practical

We present datasets in a variety of file formats to ensure that they are as accessible as possible.

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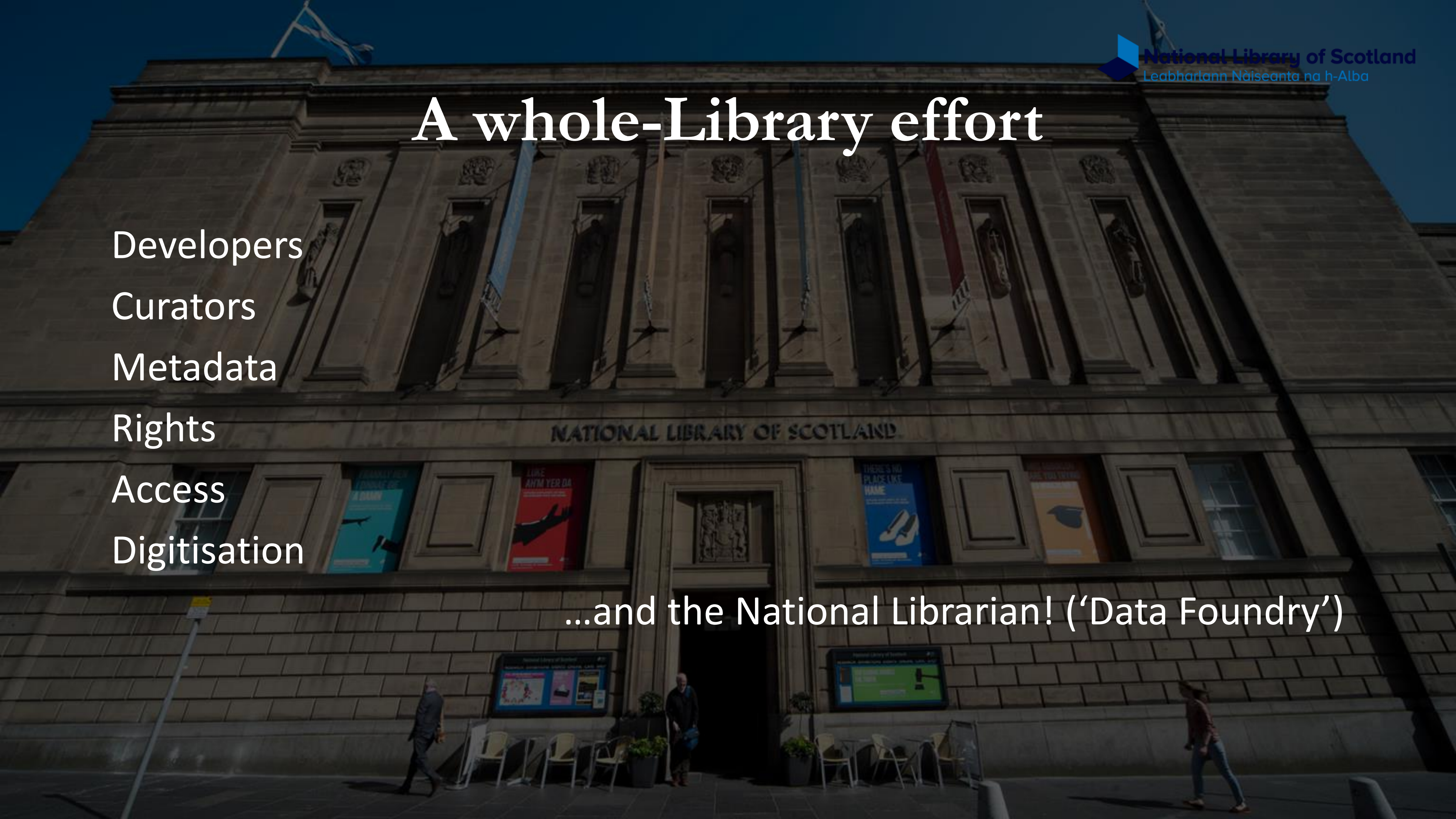
Leabharlann Nàiseanta na h-Alba

A whole-Library effort



- Developers
- Curators
- Metadata
- Rights
- Access
- Digitisation

…and the National Librarian! (‘Data Foundry’)

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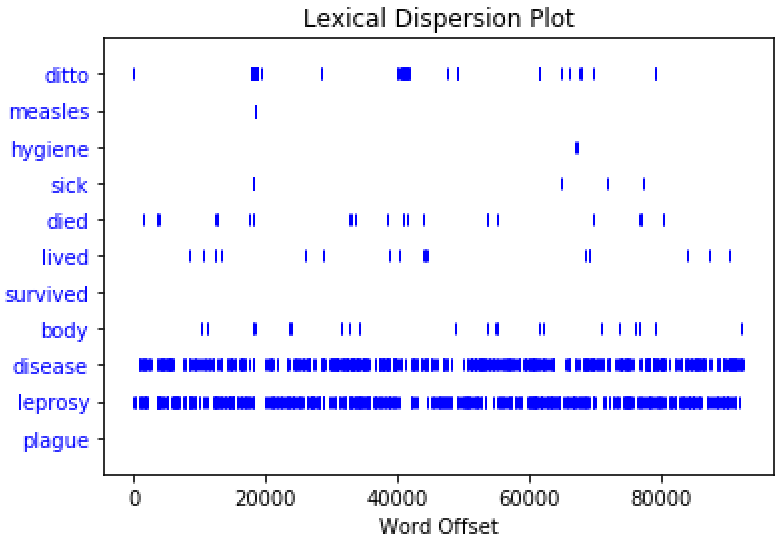
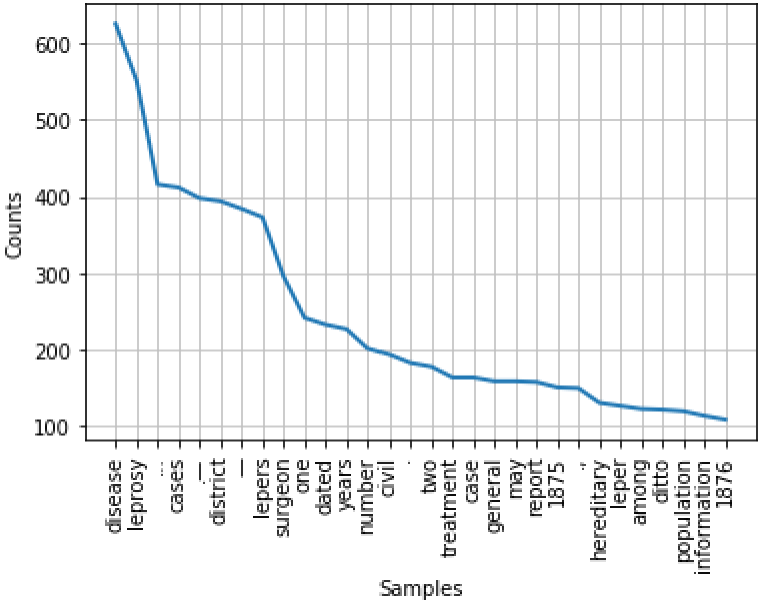
Engagement activity and outcomes

Teaching and learning

1870 - 1900
Birth of poster
& Art Nouveau
1900 - 1914
The New Century
& Early Modernism
1914-1919
PROPAGANDA
1919 - 1950
MODERNISM
& ART DECO
1950 - 1972
1972 - 1990
GLOBAL
POSTER
COLLECTION





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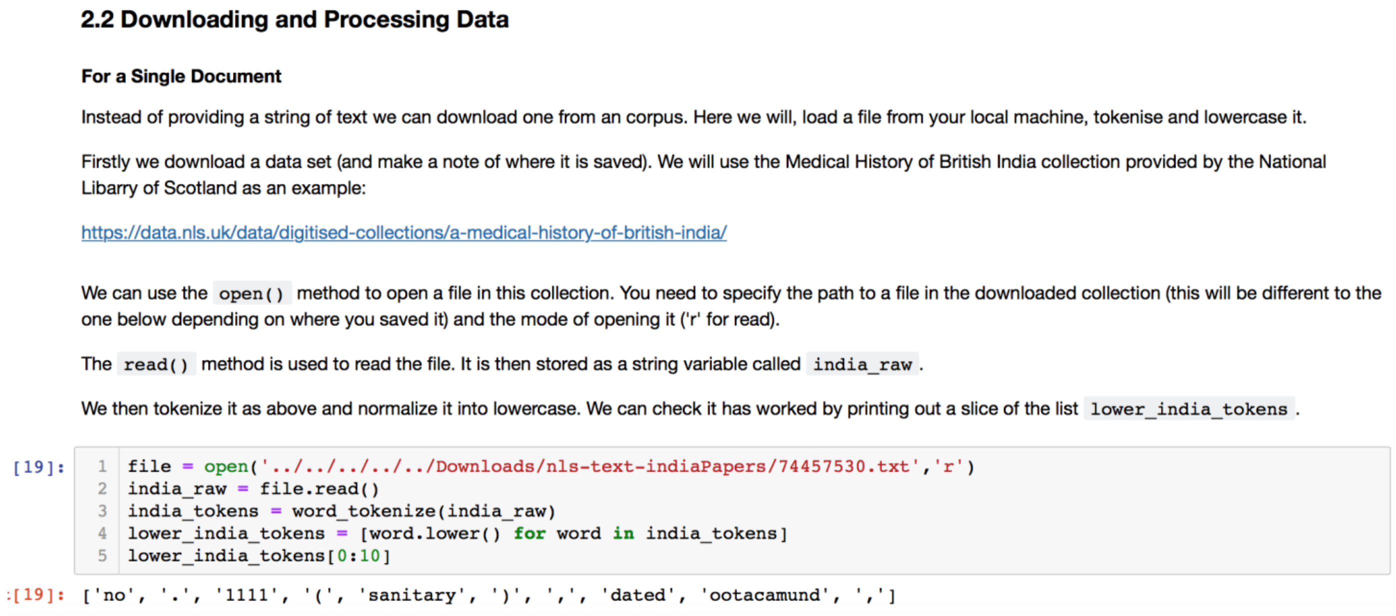
TDM Carpentry

- A Medical History of British India dataset
- Dr Bea Alex (University of Edinburgh)



2.2 Downloading and Processing Data

For a Single Document

Instead of providing a string of text we can download one from an corpus. Here we will, load a file from your local machine, tokenise and lowercase it.

Firstly we download a data set (and make a note of where it is saved). We will use the Medical History of British India collection provided by the National Libarry of Scotland as an example:

https://data.nls.uk/data/digitised-collections/a-medical-history-of-british-india/

We can use the `open()` method to open a file in this collection. You need to specify the path to a file in the downloaded collection (this will be different to the one below depending on where you saved it) and the mode of opening it ('r' for read).

The `read()` method is used to read the file. It is then stored as a string variable called `india_raw`.

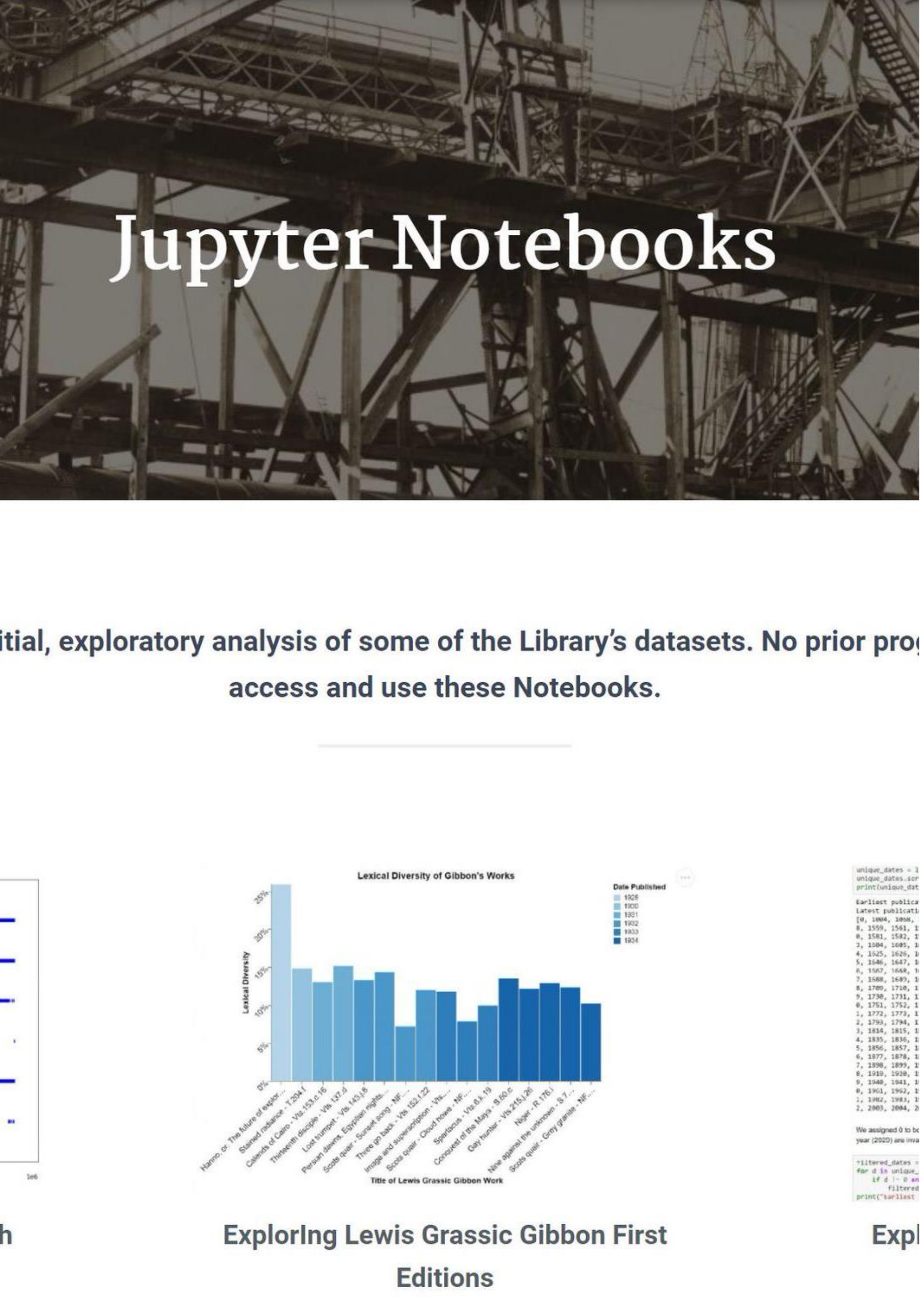
We then tokenize it as above and normalize it into lowercase. We can check it has worked by printing out a slice of the list `lower_india_tokens`.

[19]:

```
file = open('../../../../../Downloads/nls-text-indiaPapers/74457530.txt','r')
india_raw = file.read()
india_tokens = word_tokenize(india_raw)
lower_india_tokens = [word.lower() for word in india_tokens]
lower_india_tokens[0:10]
```

:[19]:

```
['no', '.', '1111', '(', 'sanitary', ')', ',', 'dated', 'ootacamund', ',']
```



Jupyter Notebooks

itial, exploratory analysis of some of the Library's datasets. No prior prog
access and use these Notebooks.

Lexical Diversity of Gibbon's Works
Lexical Diversity
25%
20%
15%
10%
5%
0%
Date Published
1928
1930
1931
1932
1933
1934
Hanno, or, The future of explor...
Stained radiance - T.204.f
Calends of Cairo - Vts.153.c.16
Thirteenth disciple - Vts.137.d
Lost trumpet - Vts.143.j.8
Persian dawns, Egyptian nights...
Scots quair - Sunset song - NF....
Three go back - Vts.152.f.22
Image and superscription - Vts....
Scots quair - Cloud howe - NF....
Spartacus - Vts.6.k.19
Conquest of the Maya - 9.60.c
Gay hunter - Vts.215.j.26
Niger - R.176.i
Nine against the unknown - S.7....
Scots quair - Grey granite - NF....
Title of Lewis Grassic Gibbon Work

h

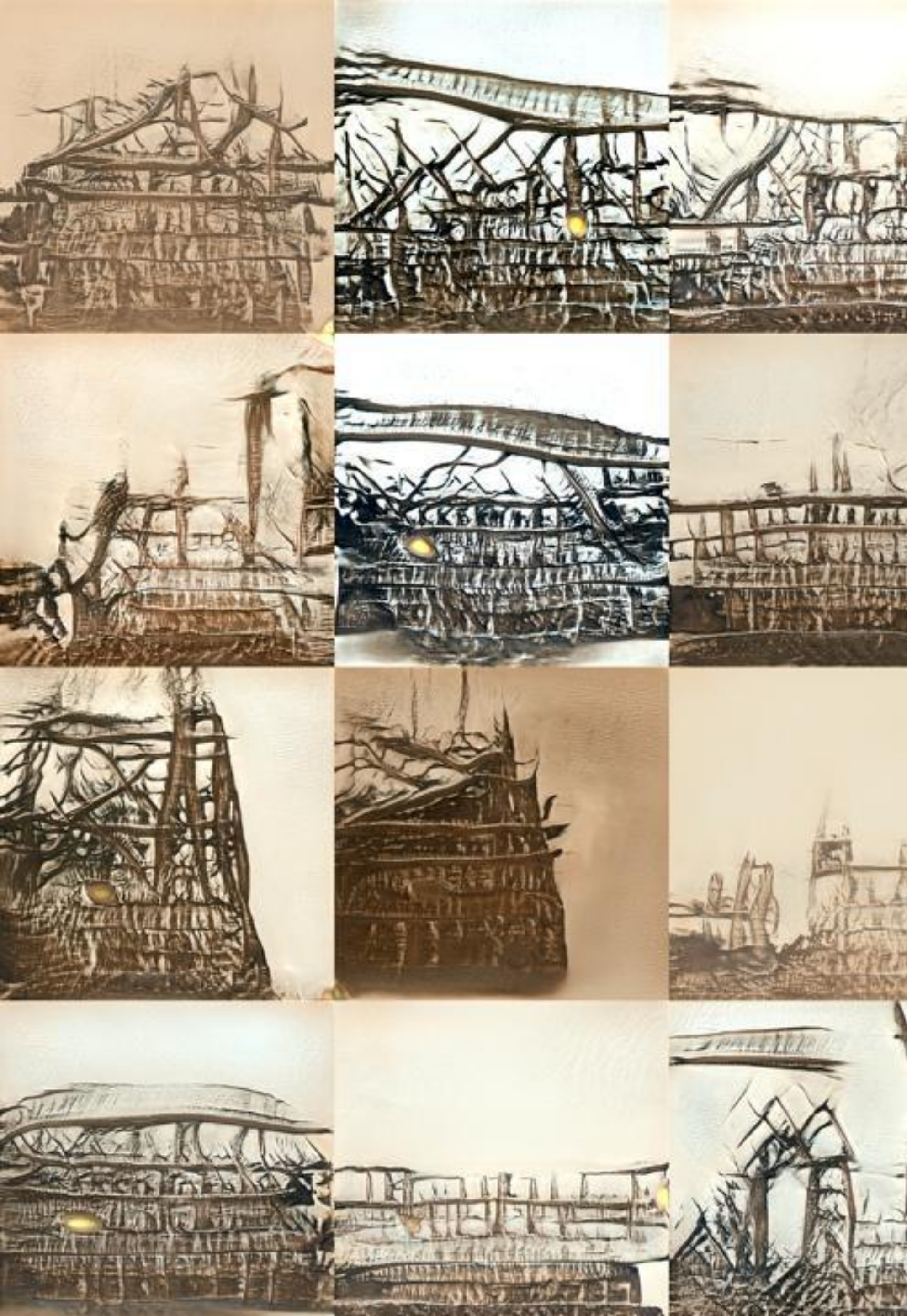
ExplorIng Lewis Grassic Gibbon First Editions

Expl

Jupyter Notebooks

- Series of Jupyter notebooks exploring some of the text and metadata datasets
- For students, learners, non-coders
- By @lucy_havens

Creative partnerships



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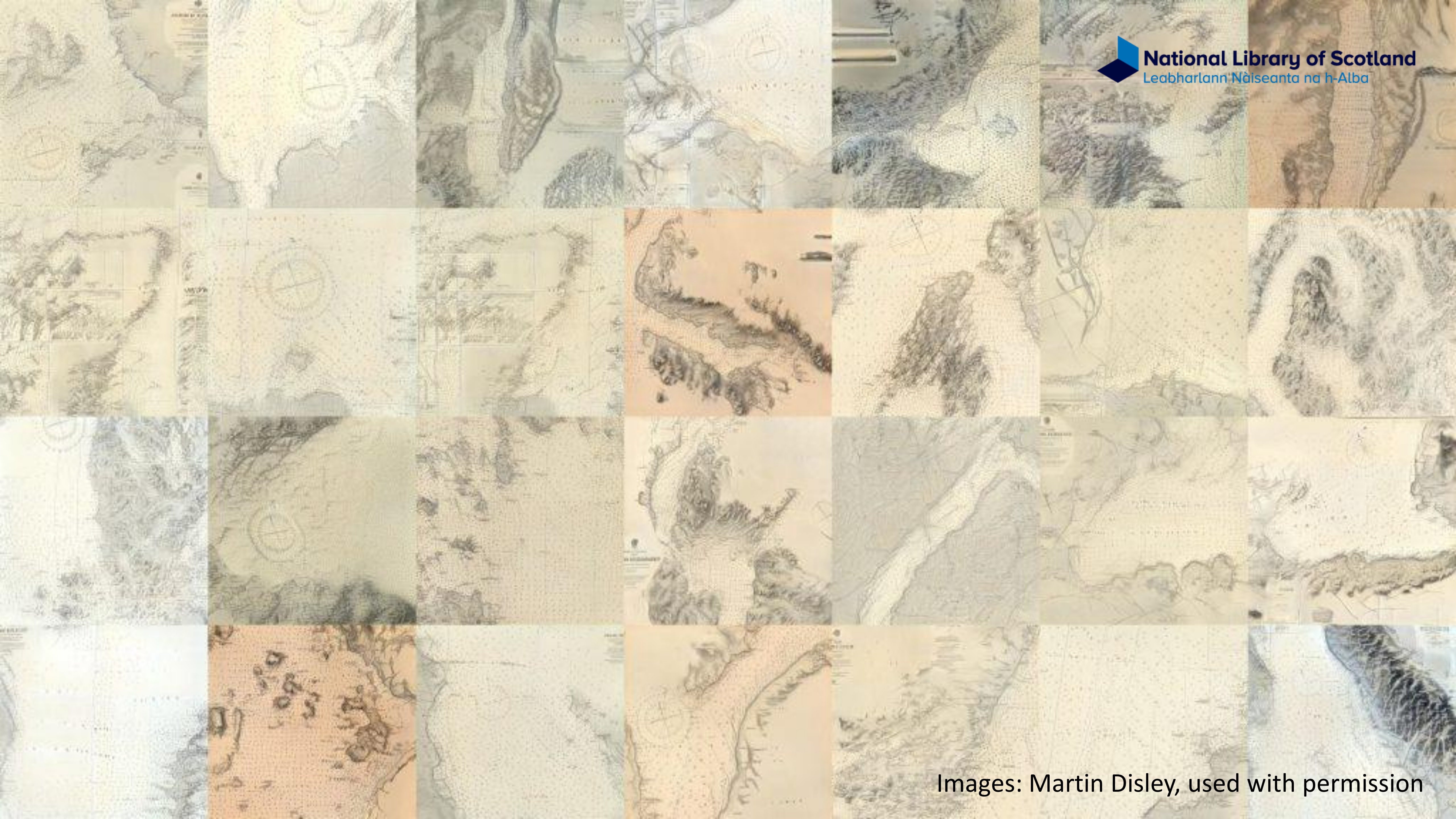
the dataset is not the map is not the territory

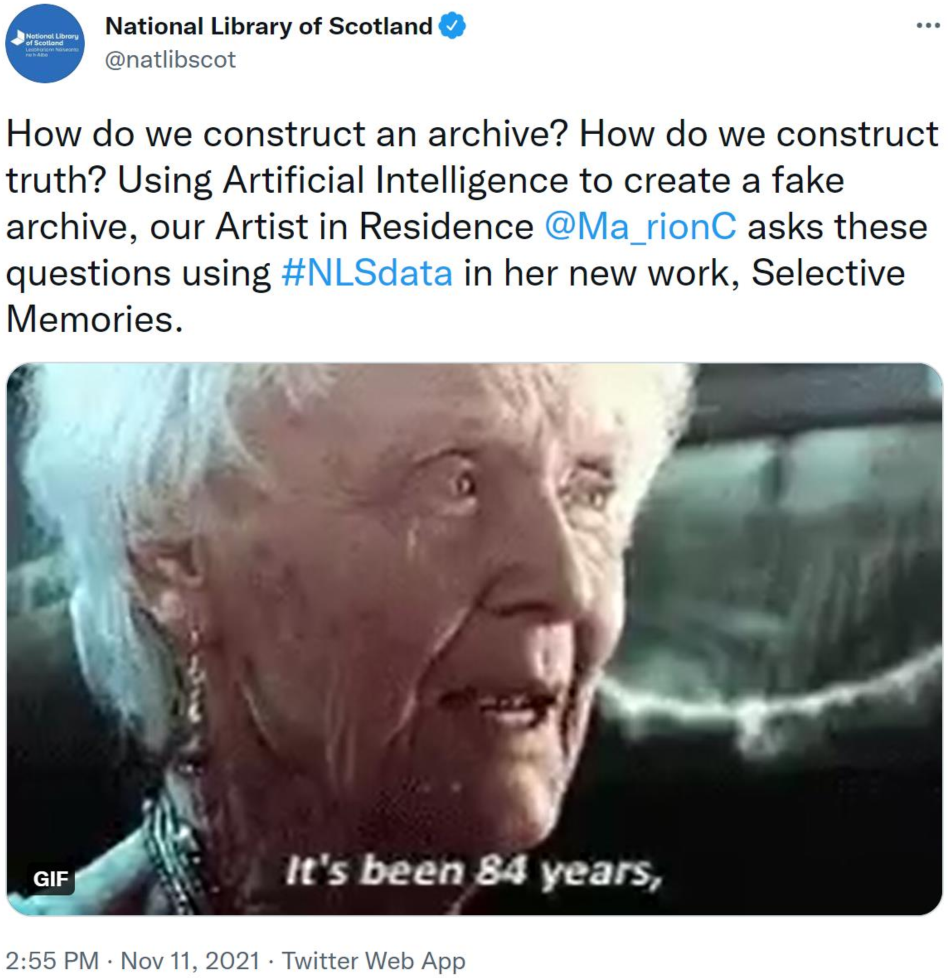
- Martin Disley @martin_disley
- Funded by Creative Informatics (University of Edinburgh)
- Using GAN techniques with the collections
- https://data.nls.uk/projects/artist-in-residence/



Images: Martin Disley, used with permission

National Library of Scotland
Leabharlann Nàiseanta na h-Alba

Is it true? The post-truth archive factory



National Library of Scotland
@natlibscot

How do we construct an archive? How do we construct truth? Using Artificial Intelligence to create a fake archive, our Artist in Residence @Ma_rionC asks these questions using #NLSdata in her new work, Selective Memories.

2:55 PM · Nov 11, 2021 · Twitter Web App

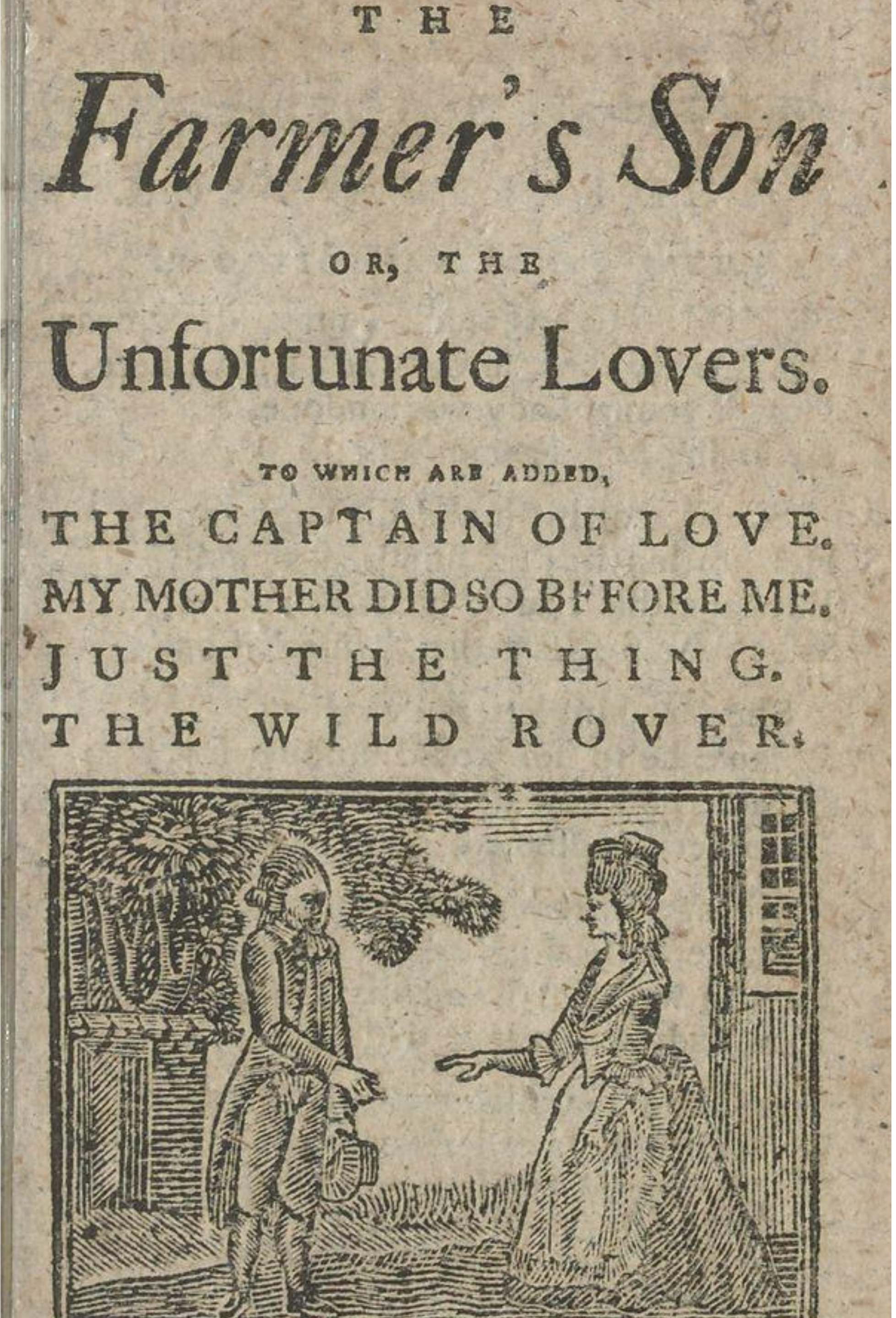
- Marion Carré @Ma_rionC
- Collaboration with Goethe-Institut Glasgow, Alliance Française Glasgow and Institut Français d’Ecosse
- Challenge: how does AI open up new ways of interacting with library and archival collections and what are the challenges and dangers of using this technology in archival research?
- Will you archive ‘fact’ or fake news?
- Take part: https://data.nls.uk/projects/artist-in-residence-marion-carre/

'Is it true? The Post-truth Archive Factory'
Marion Carré
7th December 2021 — 6th January 2022
sps~udios.org.uk/shop

Images: Marion Carré, used with permission

National Library of Scotland
Leabharlann Nàiseanta na h-Alba

Research collaborations



THE

Farmer's Son

OR, THE

Unfortunate Lovers.

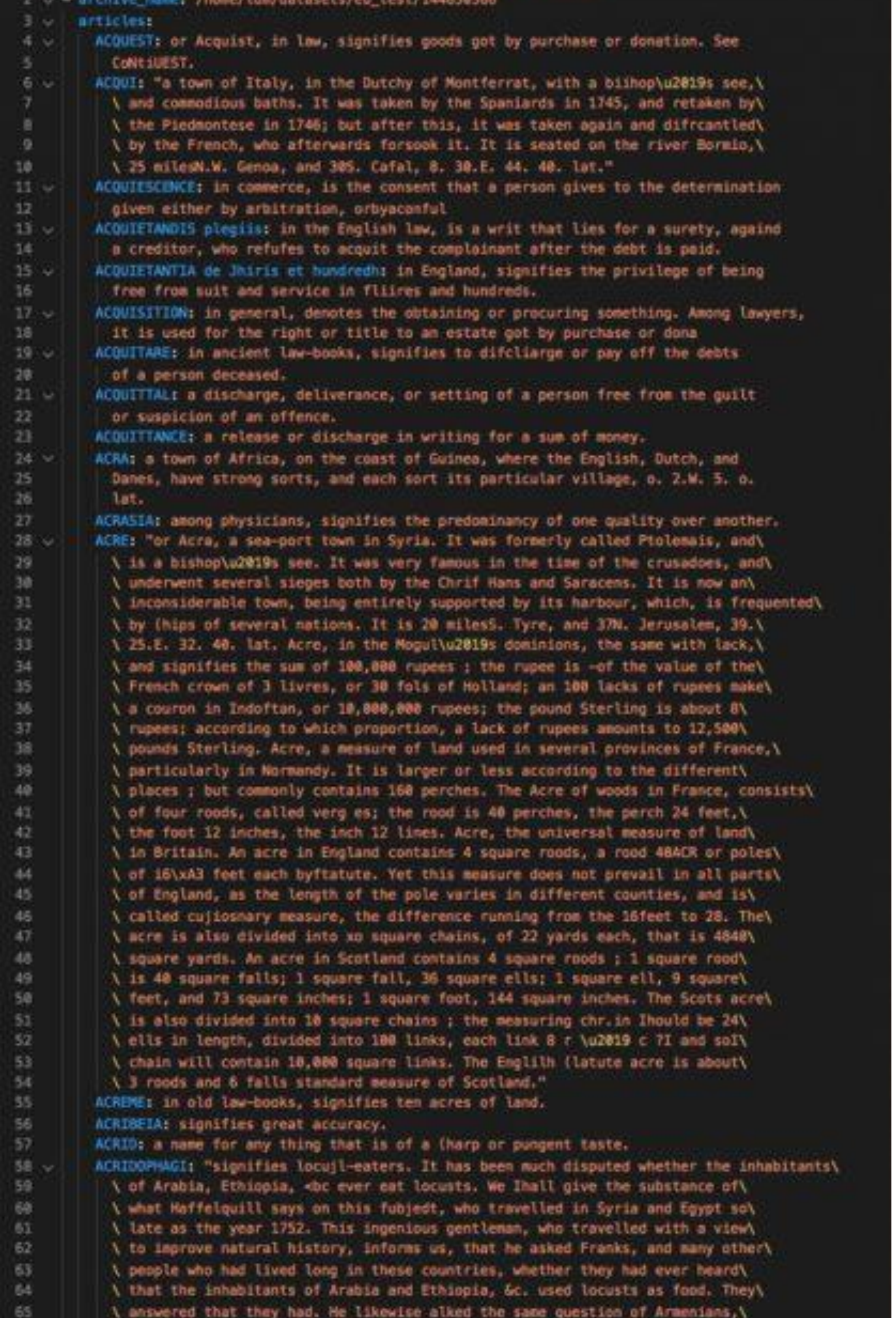
TO WHICH ARE ADDED,

THE CAPTAIN OF LOVE.
MY MOTHER DID SO BFFORE ME.
JUST THE THING.
THE WILD ROVER.

Annual fellowship 20-21

- Dr Giles Bergel (University of Oxford)
- VGG computer vision tools
- Chapbooks dataset
- Exploring what can be learnt from their illustrations about chapbooks' origins; about relationships between chapbook printers, publishers and distributors; and about the type and range of imagery available to their readers.

https://data.nls.uk/projects/the-national-librarians-research-fellowship-in-digital-scholarship



```
articles:
  ACQUEST: or Acquist, in law, signifies goods got by purchase or donation. See
    CoNtiUEST.
  ACQUI: "a town of Italy, in the Dutchy of Montferrat, with a biihop\u2019s see,\
    \ and commodious baths. It was taken by the Spaniards in 1745, and retaken by\
    \ the Piedmontese in 1746; but after this, it was taken again and difrcantled\
    \ by the French, who afterwards forsook it. It is seated on the river Bormio,\
    \ 25 milesN.W. Genoa, and 30S. Cafal, 8. 30.E. 44. 40. lat."
  ACQUIESCENCE: in commerce, is the consent that a person gives to the determination
    given either by arbitration, orbyaconful
  ACQUIETANDIS plegiis: in the English law, is a writ that lies for a surety, againd
    a creditor, who refufes to acquit the complainant after the debt is paid.
  ACQUIETANTIA de Jhiris et hundredh: in England, signifies the privilege of being
    free from suit and service in fliires and hundreds.
  ACQUISITION: in general, denotes the obtaining or procuring something. Among lawyers,
    it is used for the right or title to an estate got by purchase or dona
  ACQUITARE: in ancient law-books, signifies to difcliarge or pay off the debts
    of a person deceased.
  ACQUITTAL: a discharge, deliverance, or setting of a person free from the guilt
    or suspicion of an offence.
  ACQUITTANCE: a release or discharge in writing for a sum of money.
  ACRA: a town of Africa, on the coast of Guinea, where the English, Dutch, and
    Danes, have strong sorts, and each sort its particular village, o. 2.W. 5. o.
    lat.
  ACRASIA: among physicians, signifies the predominancy of one quality over another.
  ACRE: "or Acra, a sea-port town in Syria. It was formerly called Ptolemais, and\
    \ is a bishop\u2019s see. It was very famous in the time of the crusadoes, and\
    \ underwent several sieges both by the Chrif Hans and Saracens. It is now an\
    \ inconsiderable town, being entirely supported by its harbour, which, is frequented\
    \ by (hips of several nations. It is 20 milesS. Tyre, and 37N. Jerusalem, 39.\
    \ 25.E. 32. 40. lat. Acre, in the Mogul\u2019s dominions, the same with lack,\
    \ and signifies the sum of 100,000 rupees ; the rupee is -of the value of the\
    \ French crown of 3 livres, or 30 fols of Holland; an 100 lacks of rupees make\
    \ a couron in Indoftan, or 10,000,000 rupees; the pound Sterling is about 8\
    \ rupees; according to which proportion, a lack of rupees amounts to 12,500\
    \ pounds Sterling. Acre, a measure of land used in several provinces of France,\
    \ particularly in Normandy. It is larger or less according to the different\
    \ places ; but commonly contains 160 perches. The Acre of woods in France, consists\
    \ of four roods, called verg es; the rood is 40 perches, the perch 24 feet,\
    \ the foot 12 inches, the inch 12 lines. Acre, the universal measure of land\
    \ in Britain. An acre in England contains 4 square roods, a rood 40ACR or poles\
    \ of 16\xA3 feet each byftatute. Yet this measure does not prevail in all parts\
    \ of England, as the length of the pole varies in different counties, and is\
    \ called cujiosnary measure, the difference running from the 16feet to 28. The\
    \ acre is also divided into xo square chains, of 22 yards each, that is 4840\
    \ square yards. An acre in Scotland contains 4 square roods ; 1 square rood\
    \ is 40 square falls; 1 square fall, 36 square ells; 1 square ell, 9 square\
    \ feet, and 73 square inches; 1 square foot, 144 square inches. The Scots acre\
    \ is also divided into 10 square chains ; the measuring chr.in Ihould be 24\
    \ ells in length, divided into 100 links, each link 8 r \u2019 c ?I and soI\
    \ chain will contain 10,000 square links. The Englith (latute acre is about\
    \ 3 roods and 6 falls standard measure of Scotland."
  ACREME: in old law-books, signifies ten acres of land.
  ACRIBEIA: signifies great accuracy.
  ACRID: a name for any thing that is of a (harp or pungent taste.
  ACRIDOPHAGI: "signifies locujl-eaters. It has been much disputed whether the inhabitants\
    \ of Arabia, Ethiopia, <bc ever eat locusts. We Ihall give the substance of\
    \ what Haffelquill says on this fubjedt, who travelled in Syria and Egypt so\
    \ late as the year 1752. This ingenious gentleman, who travelled with a view\
    \ to improve natural history, informs us, that he asked Franks, and many other\
    \ people who had lived long in these countries, whether they had ever heard\
    \ that the inhabitants of Arabia and Ethiopia, &c. used locusts as food. They\
    \ answered that they had. He likewise alked the same question of Armenians,\
```

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Annual fellowship 21-22

- Dr Rosa Filgueira (St Andrews University)
  - AI toolkit for the collections: bringing AI tools to those who can't code
  - Initially with the Encyclopaedia Britannica dataset

https://data.nls.uk/projects/the-national-librarians-research-fellowship-in-digital-scholarship-2021-22/

Annual fellowship 22-23

- Dr Gustavo Candela (University of Alicante)
    - Exploring the Semantic Web and Wikidata with Library metadata collections

https://data.nls.uk/projects/the-national-librarians-research-fellowship-in-digital-scholarship-2022-23/

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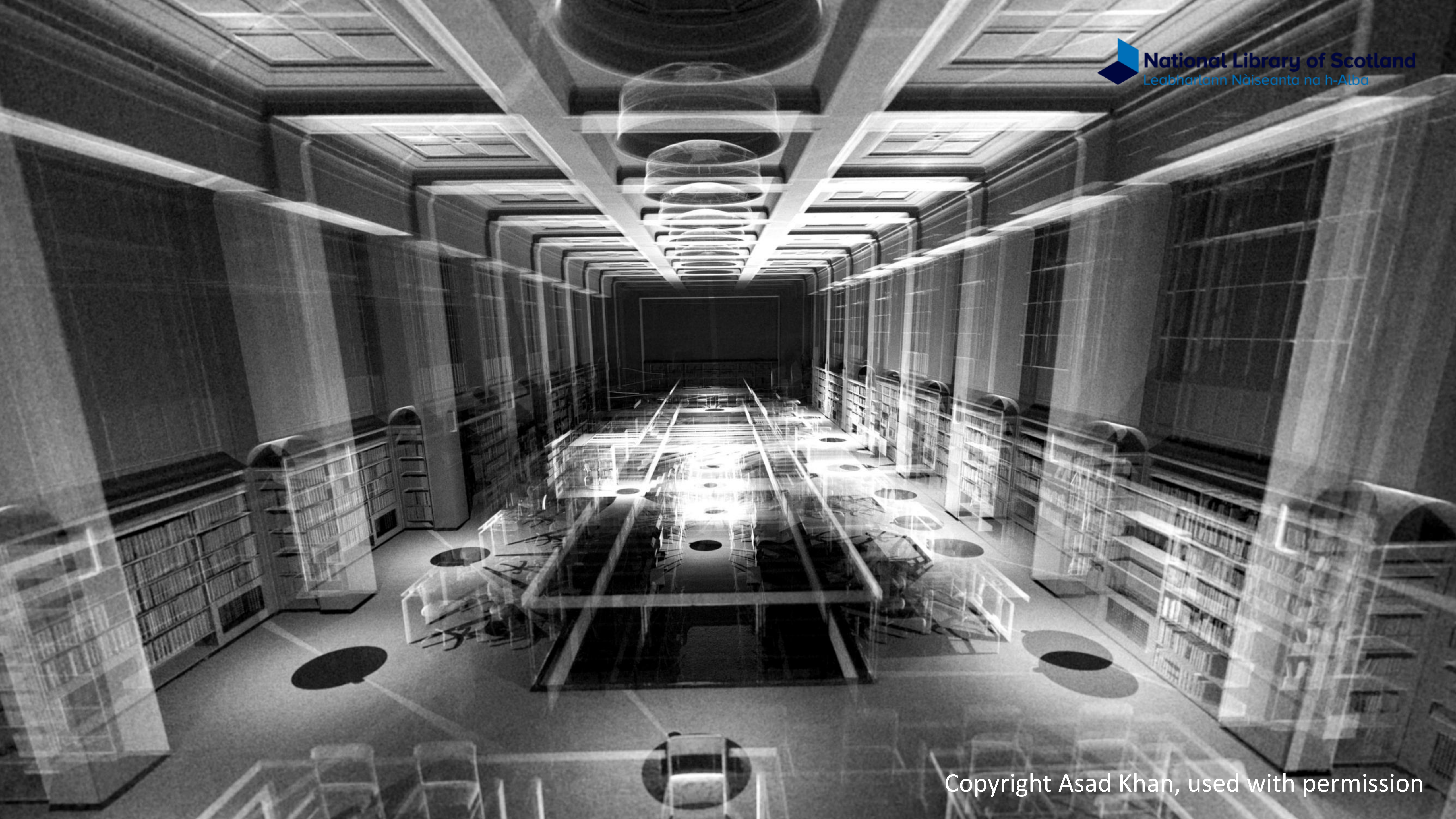
PhD studentships

Joe Nockels
'Adopting Transkribus in the National Library of Scotland: Understanding how handwritten text recognition will change management and use of digitised manuscripts'.
Supervisors: Professor Melissa Terras (University of Edinburgh), Dr Paul Gooding (University of Glasgow), Dr Sarah Ames and Stephen Rigden (National Library of Scotland).
Funder: Scottish Graduate School for Arts and Humanities, AHRC Collaborative Doctoral Award

Ash Charlton
'Slavery and Race in the Encyclopaedia Britannica (1768-1860): A Text Mining Approach'.
Supervisors: Professor Melissa Terras and Professor Diana Paton (University of Edinburgh), Dr Sarah Ames and Robert Betteridge (National Library of Scotland)
Funder: Scottish Graduate School for Arts and Humanities, AHRC Collaborative Doctoral Award



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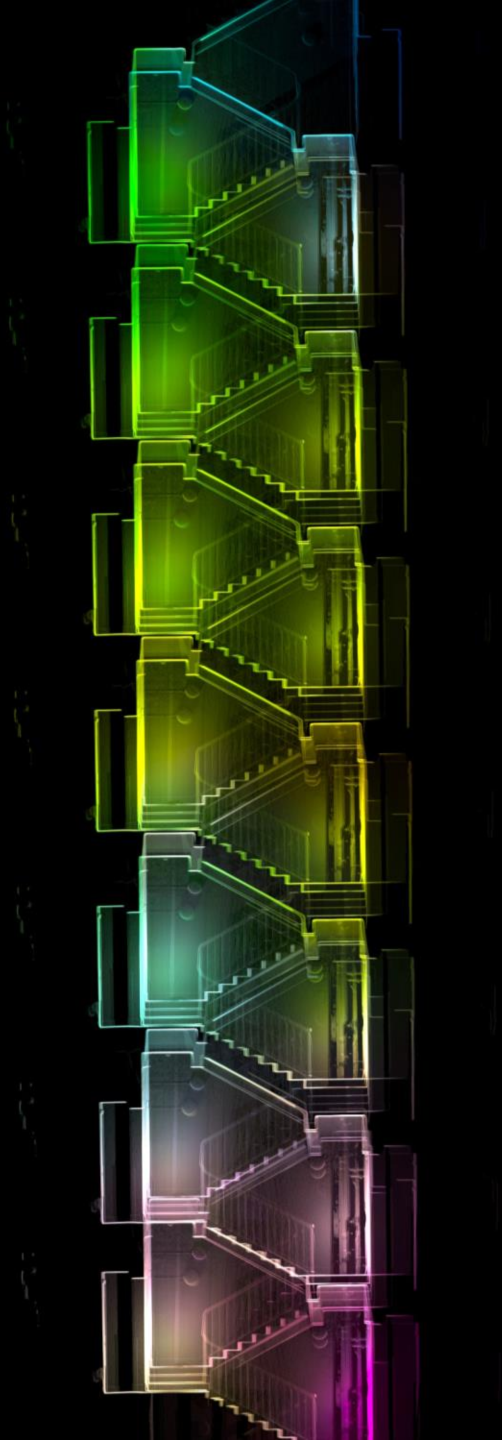

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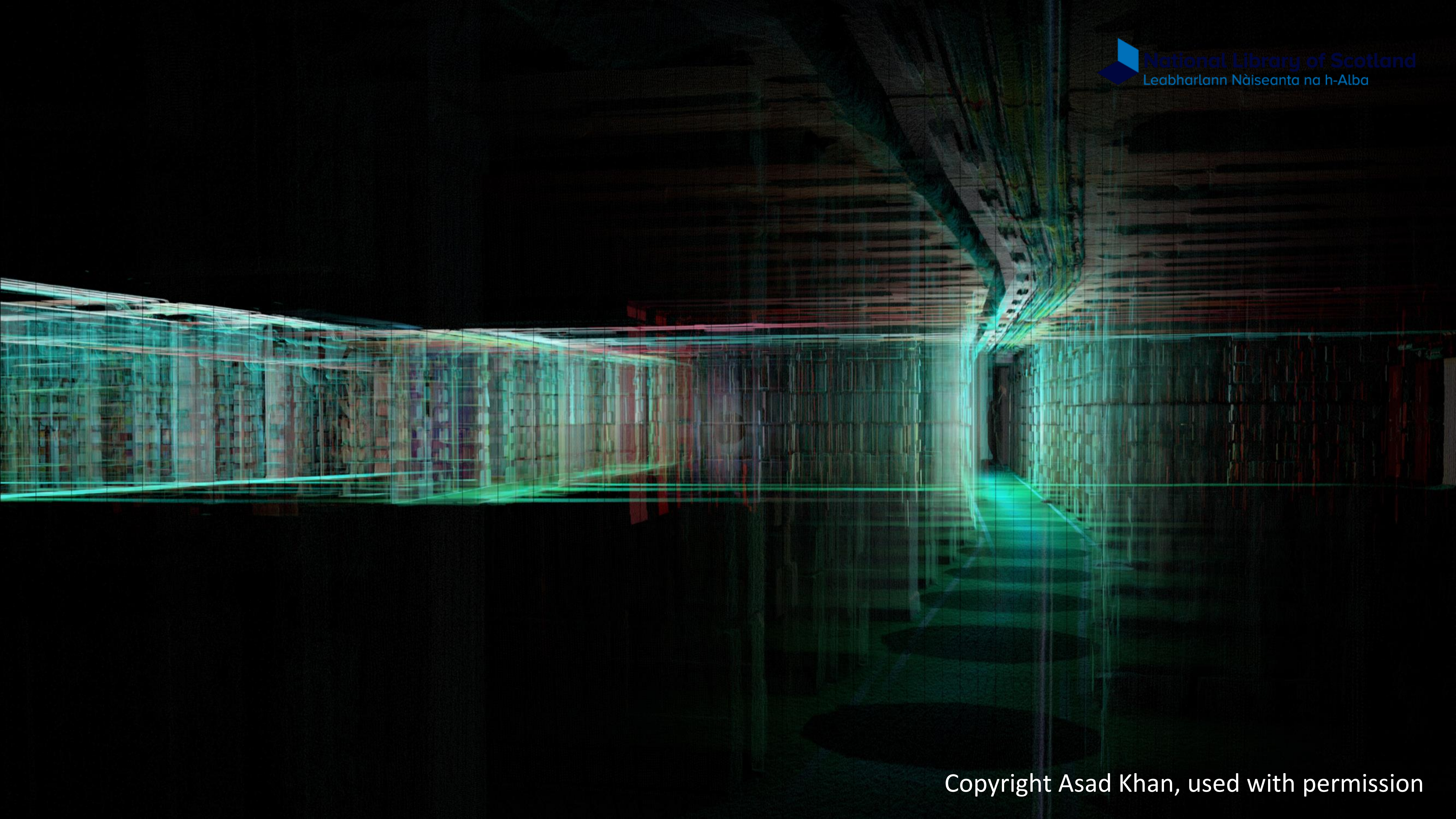

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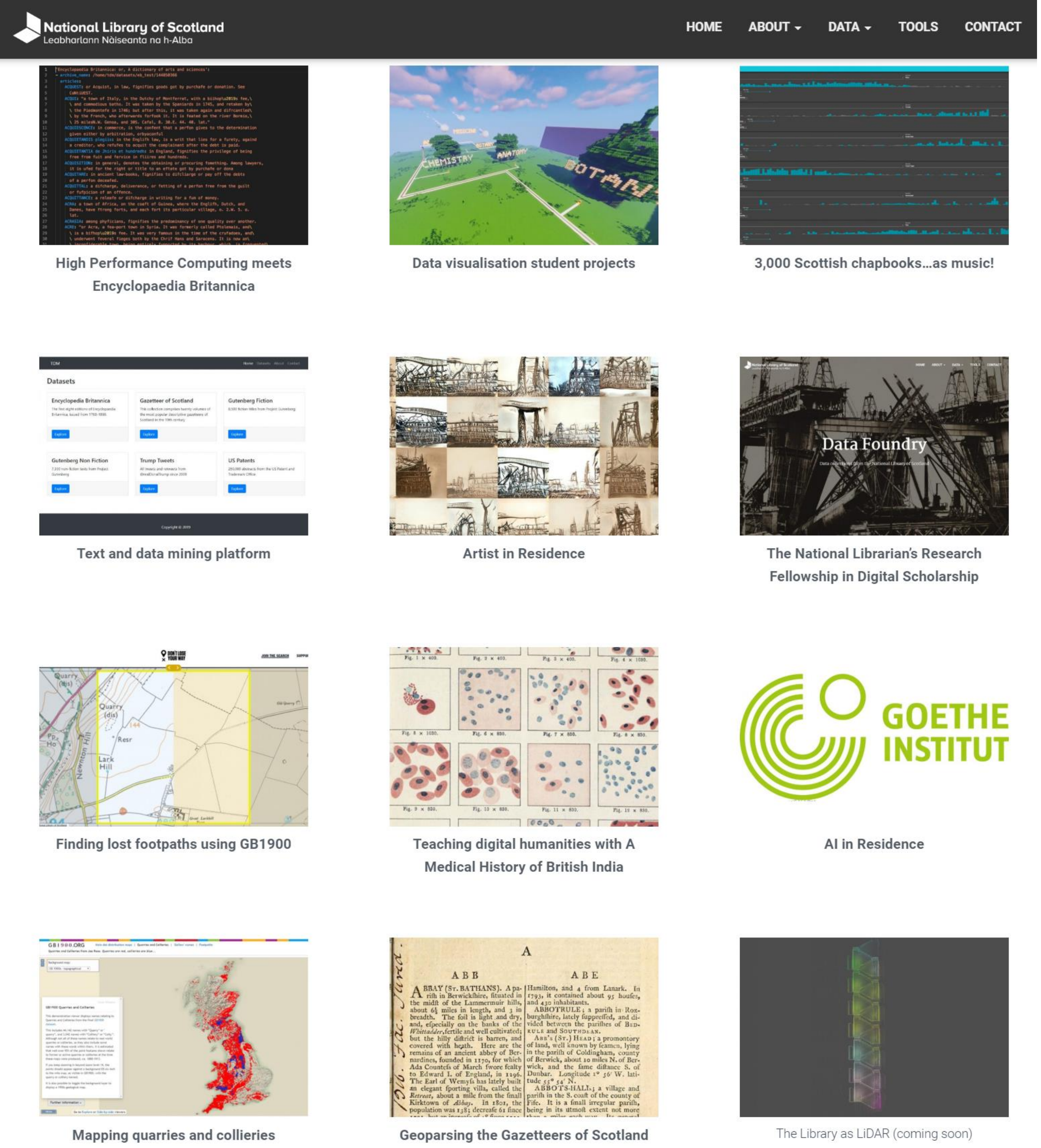


High Performance Computing meets Encyclopaedia Britannica

Data visualisation student projects

3,000 Scottish chapbooks...as music!

Text and data mining platform

Artist in Residence

The National Librarian's Research Fellowship in Digital Scholarship

Finding lost footpaths using GB1900

Teaching digital humanities with A Medical History of British India

AI in Residence

Mapping quarries and collieries

Geoparsing the Gazetteers of Scotland

The Library as LiDAR (coming soon)

Projects

https://data.nls.uk/projects/

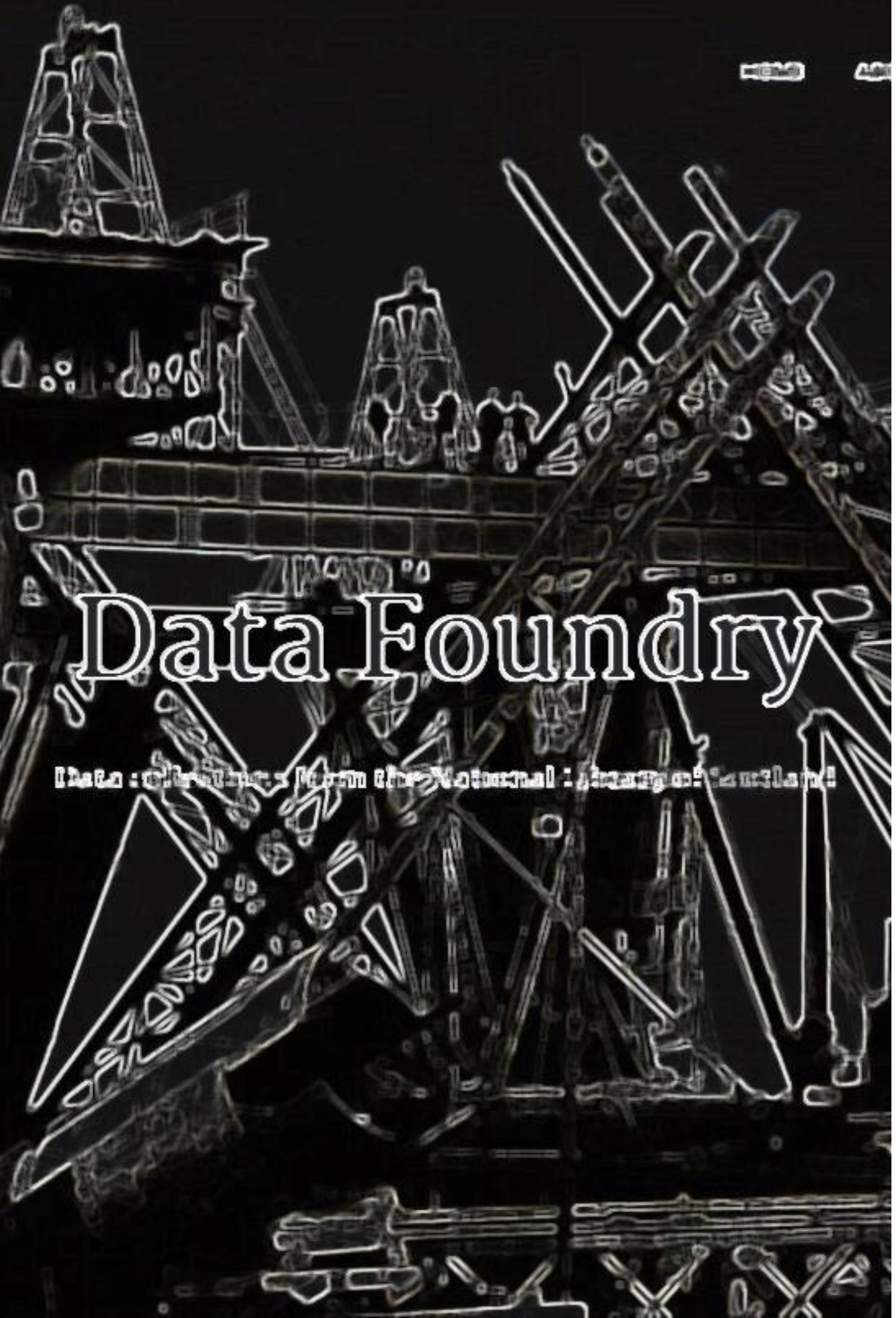
Examples of collaborative and individual projects over the past 6 months

The way forward

National Library of Scotland
Leabharlann Nàiseanta na h-Alba

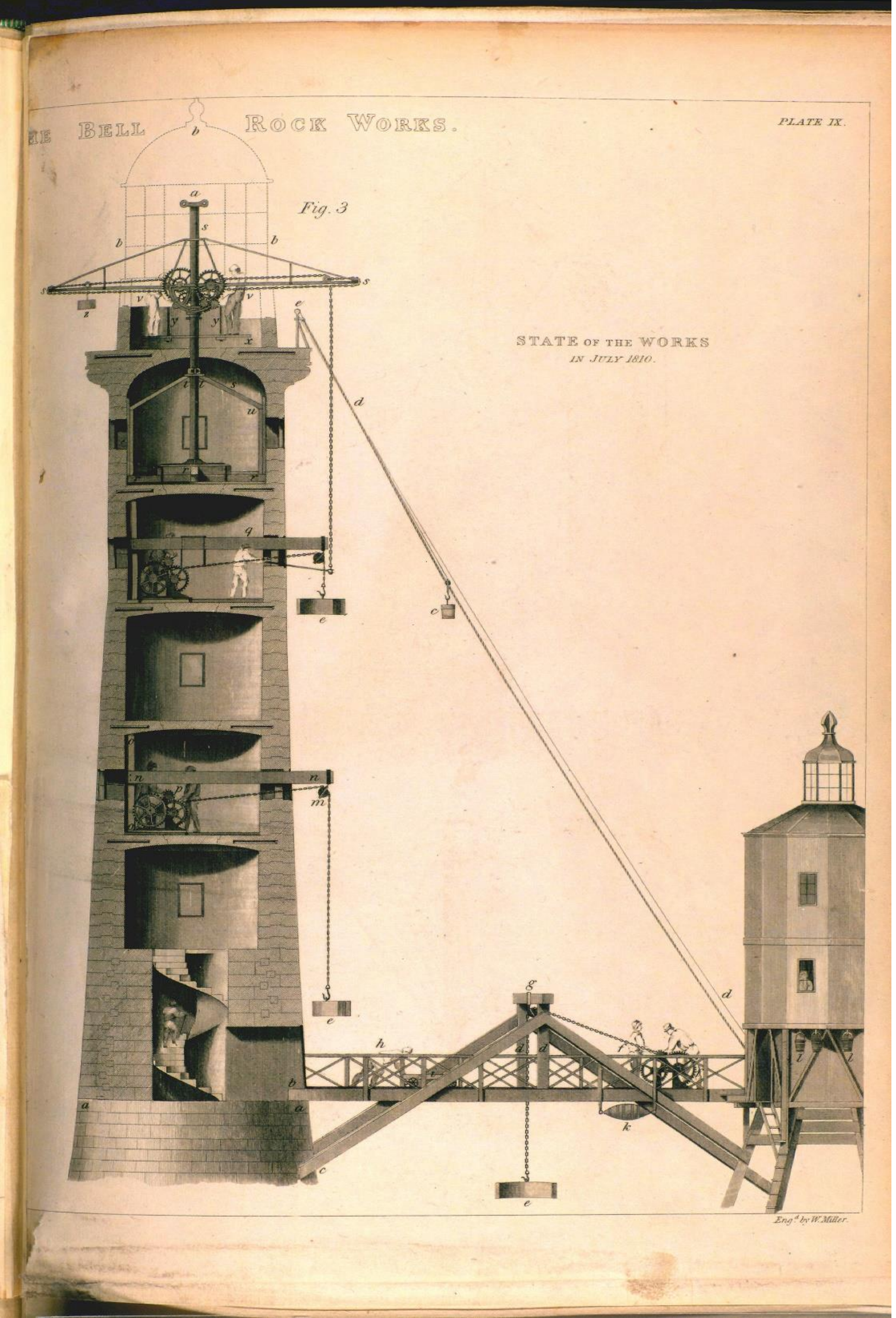
Beyond the 'collection'

- Mix 'n' match datasets
  - New DAMS will enable staff to create non-collection-driven datasets
  - Eventually extend this to users?
  - User-driven



‘Dark’ Data Foundry

- Non-open data
- Gradually increase organisational appetite for risk
- Data Safe Haven?



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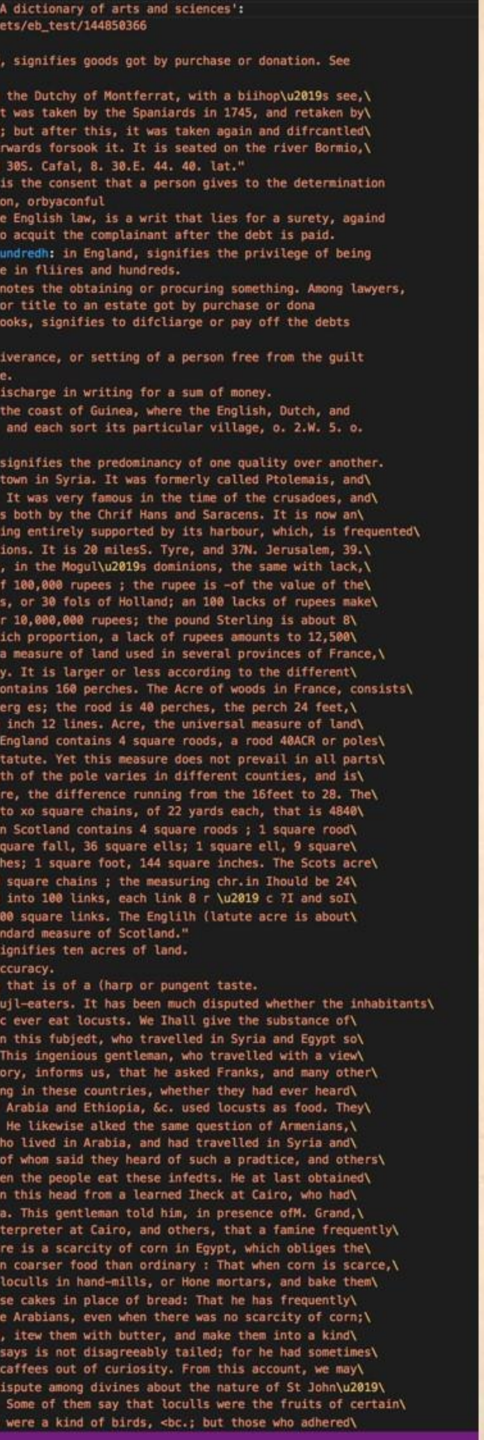
Improved engineering

- Ingest of modified datasets
- More sophisticated search
- In-house tech support
- Library as data: Library itself as a ‘data space’



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A dictionary of arts and sciences':
ets/eb_test/144850366

, signifies goods got by purchase or donation. See

 the Dutchy of Montferrat, with a biihop\u2019s see,\
t was taken by the Spaniards in 1745, and retaken by\
; but after this, it was taken again and difrcantled\
rwards forsook it. It is seated on the river Bormio,\
 30S. Cafal, 8. 30.E. 44. 40. lat."
is the consent that a person gives to the determination
on, orbyaconful
e English law, is a writ that lies for a surety, againd
o acquit the complainant after the debt is paid.
undredh: in England, signifies the privilege of being
e in fliires and hundreds.
notes the obtaining or procuring something. Among lawyers,
or title to an estate got by purchase or dona
ooks, signifies to difcliarge or pay off the debts

iverance, or setting of a person free from the guilt
e.
ischarge in writing for a sum of money.
the coast of Guinea, where the English, Dutch, and
 and each sort its particular village, o. 2.W. 5. o.

signifies the predominancy of one quality over another.
town in Syria. It was formerly called Ptolemais, and\
 It was very famous in the time of the crusadoes, and\
s both by the Chrif Hans and Saracens. It is now an\
ing entirely supported by its harbour, which, is frequented\
ions. It is 20 milesS. Tyre, and 37N. Jerusalem, 39.\
, in the Mogul\u2019s dominions, the same with lack,\
f 100,000 rupees ; the rupee is -of the value of the\
s, or 30 fols of Holland; an 100 lacks of rupees make\
r 10,000,000 rupees; the pound Sterling is about 8\
ich proportion, a lack of rupees amounts to 12,500\
a measure of land used in several provinces of France,\
y. It is larger or less according to the different\
ontains 160 perches. The Acre of woods in France, consists\
erg es; the rood is 40 perches, the perch 24 feet,\
 inch 12 lines. Acre, the universal measure of land\
England contains 4 square roods, a rood 40ACR or poles\
tatute. Yet this measure does not prevail in all parts\
th of the pole varies in different counties, and is\
re, the difference running from the 16feet to 28. The\
to xo square chains, of 22 yards each, that is 4840\
n Scotland contains 4 square roods ; 1 square rood\
quare fall, 36 square ells; 1 square ell, 9 square\
hes; 1 square foot, 144 square inches. The Scots acre\
 square chains ; the measuring chr.in Ihould be 24\
 into 100 links, each link 8 r \u2019 c ?I and soI\
00 square links. The Englilh (latute acre is about\
ndard measure of Scotland."
ignifies ten acres of land.
ccuracy.
 that is of a (harp or pungent taste.
ujl-eaters. It has been much disputed whether the inhabitants\
c ever eat locusts. We Ihall give the substance of\
n this fubjedt, who travelled in Syria and Egypt so\
This ingenious gentleman, who travelled with a view\
ory, informs us, that he asked Franks, and many other\
ng in these countries, whether they had ever heard\
 Arabia and Ethiopia, &c. used locusts as food. They\
 He likewise alked the same question of Armenians,\
ho lived in Arabia, and had travelled in Syria and\
of whom said they heard of such a pradtice, and others\
en the people eat these infedts. He at last obtained\
n this head from a learned Iheck at Cairo, who had\
a. This gentleman told him, in presence ofM. Grand,\
terpreter at Cairo, and others, that a famine frequently\
re is a scarcity of corn in Egypt, which obliges the\
n coarser food than ordinary : That when corn is scarce,\
loculls in hand-mills, or Hone mortars, and bake them\
se cakes in place of bread: That he has frequently\
e Arabians, even when there was no scarcity of corn;\
, itew them with butter, and make them into a kind\
says is not disagreeably tailed; for he had sometimes\
caffees out of curiosity. From this account, we may\
ispute among divines about the nature of St John\u2019\
 Some of them say that loculls were the fruits of certain\
 were a kind of birds, <bc.; but those who adhered\
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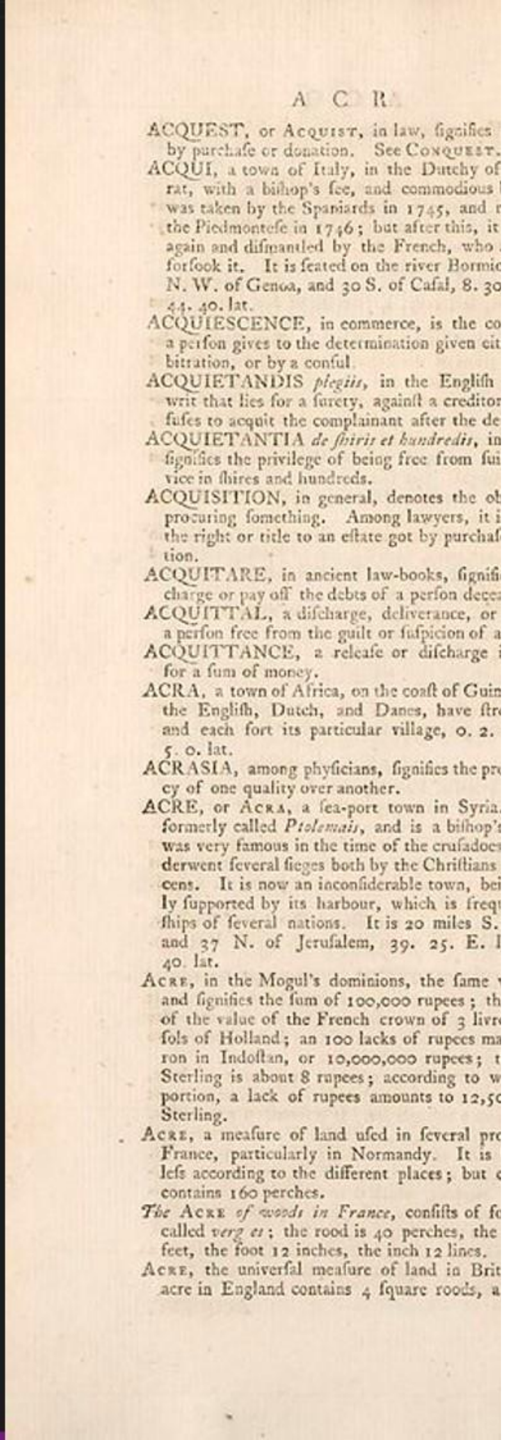

A C R

ACQUEST, or Acquist, in law, ſignifies
by purchaſe or donation. See Conquest.
ACQUI, a town of Italy, in the Dutchy of
rat, with a biſhop's ſee, and commodious
was taken by the Spaniards in 1745, and r
the Piedmonteſe in 1746; but after this, it
again and diſmantled by the French, who
forſook it. It is ſeated on the river Bormic
N. W. of Genoa, and 30 S. of Caſal, 8. 30
44. 40. lat.
ACQUIESCENCE, in commerce, is the co
a perſon gives to the determination given cit
bitration, or by a conſul.
ACQUIETANDIS *plegiis*, in the Engliſh
writ that lies for a ſurety, againſt a creditor
fuſes to acquit the complainant after the de
ACQUIETANTIA *de ſhiris et hundredis*, in
ſignifies the privilege of being free from ſui
vice in ſhires and hundreds.
ACQUISITION, in general, denotes the ob
procuring ſomething. Among lawyers, it i
the right or title to an eſtate got by purchaſ
tion.
ACQUITARE, in ancient law-books, ſignifi
charge or pay off the debts of a perſon dece
ACQUITTAL, a diſcharge, deliverance, or
a perſon free from the guilt or ſuſpicion of a
ACQUITTANCE, a releaſe or diſcharge i
for a ſum of money.
ACRA, a town of Africa, on the coaſt of Guin
the Engliſh, Dutch, and Danes, have ſtr
and each fort its particular village, o. 2.
5. o. lat.
ACRASIA, among phyſicians, ſignifies the pr
cy of one quality over another.
ACRE, or Acra, a ſea-port town in Syria.
formerly called *Ptolemais*, and is a biſhop's
was very famous in the time of the cruſadoes
derwent ſeveral ſieges both by the Chriſtians
cens. It is now an inconſiderable town, bei
ly ſupported by its harbour, which is freq
ſhips of ſeveral nations. It is 20 miles S.
and 37 N. of Jeruſalem, 39. 25. E. l
40. lat.
Acre, in the Mogul's dominions, the ſame
and ſignifies the ſum of 100,000 rupees; th
of the value of the French crown of 3 livr
ſols of Holland; an 100 lacks of rupees ma
ron in Indoſtan, or 10,000,000 rupees; t
Sterling is about 8 rupees; according to w
portion, a lack of rupees amounts to 12,5
Sterling.
Acre, a meaſure of land uſed in ſeveral pr
France, particularly in Normandy. It is
leſs according to the different places; but
contains 160 perches.
The Acre *of woods in France*, conſiſts of f
called *verg es*; the rood is 40 perches, the
feet, the foot 12 inches, the inch 12 lines.
Acre, the univerſal meaſure of land in Brit
acre in England contains 4 ſquare roods, a

Analysis layers

- Dr Rosa Filgueira – Fellowship project
- Potential for platforms to be built on top of Data Foundry, given the standardised nature of the data

(Inter)national infrastructure?

- The success of Data Foundry depends on community
- Project led by Universities of Glasgow/Sheffield

Challenges

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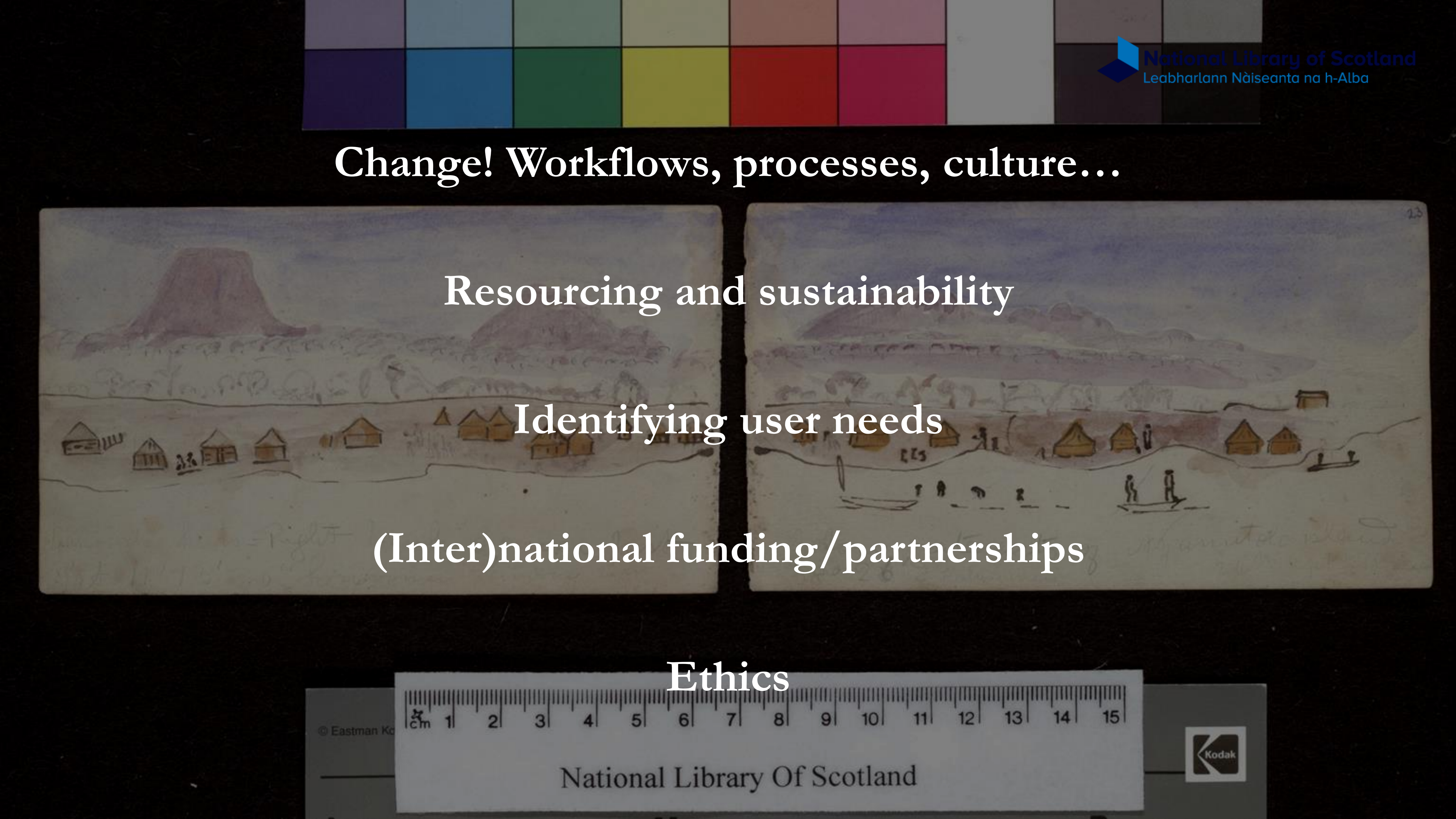
Change! Workflows, processes, culture…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cm 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
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Kodak

Resourcing and sustainability

Identifying user needs

(Inter)national funding/partnerships

Ethics

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Thank you!

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@semames1 | #NLSdata