the Taming of the Unstructured Data

Rayvn Manuel

Smithsonian
National Museum of African American History and Culture

Agenda

- About….
- Brief History of the Bureau
- Congressional Mandate
- Datasets
- Searchability
- *DEMO*
- Next Steps & //TODOs
- Qs?

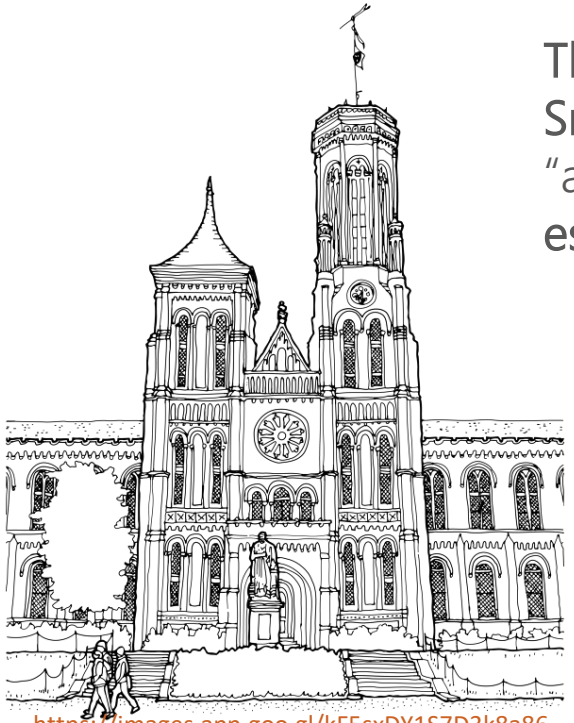
NATIONAL MUSEUM of AFRICAN AMERICAN HISTORY & CULTURE

Smithsonian

About…

Smithsonian
National Museum of African American History and Culture

the Smithsonian Institution



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Smithsonian Institution

The Smithsonian Institution [si.edu] was established with funds from James Smithson, a British scientist who left his estate to the United States to found "at Washington, under the name of the Smithsonian Institution, an establishment for the increase and diffusion of knowledge."

The U.S. Senate passed the act organizing the Smithsonian Institution which was signed into law by President James K. Polk on August 10, 1846.

The Smithsonian is made up of 19 museums, 21 libraries, the National Zoo, numerous education and research centers, including the Smithsonian Astrophysics Observatory, Smithsonian Tropical Research Institute, Smithsonian Environmental Research Center, and Smithsonian Science Education Center.

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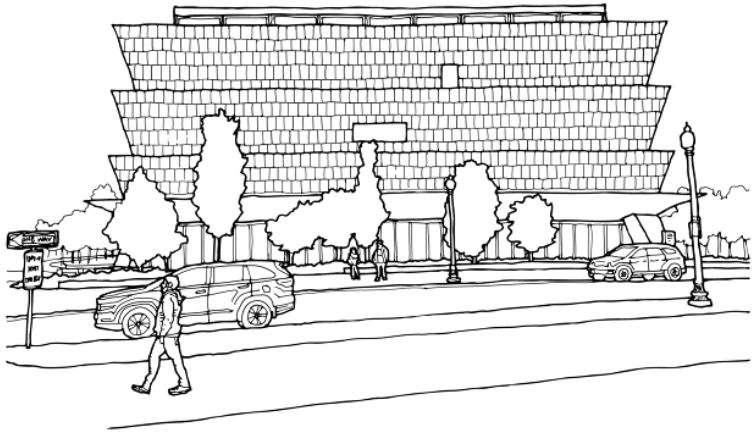
the National Museum of African American History & Culture

The **National Museum of African American History and Culture** [NMAAHC – nmaahc.si.edu] is the only national museum devoted exclusively to the documentation of African American life, history, and culture.

The museum **was established by an Act of Congress in 2003** and was **opened to the public on September 24, 2016, as the 19th and newest museum of the Smithsonian Institution**. To date, the Museum has **collected more than 36,000 artifacts and nearly 100,000** individuals have become **members**.



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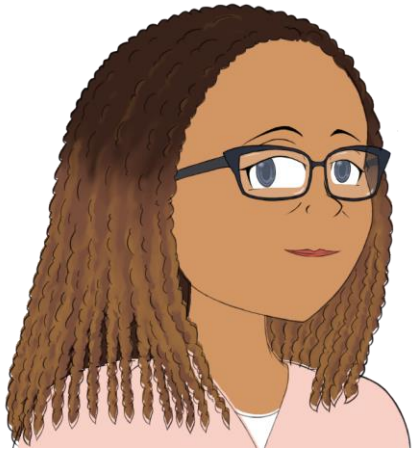
Me

& why am I standing up here speaking to you



Sworn in on 9 January 2017, I serve as the **Senior Application Developer and DevOps engineer** for NMAAHC.

I am the principle developer **responsible for the implementation of the hands-on interactives** scattered throughout the museum.

Taming of the Unstructured Data is a **tale of** transforming **two (2) unruly and somewhat feral datasets into a searchable, web-based application and kiosk interactive.**

The interactive was designed for the enjoyment of the museum's visitors as well as a research tool for genealogists and historians **to explore the digitized archive of the Freedmen's Bureau Records.**

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Brief History of the Bureau

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the "Bureau"

https://images.app.goo.gl/t56fy6m1Y5diRuKY9

The **Bureau of Refugees, Freedmen and Abandoned Lands (Freedmen's Bureau)** was **established in 1865 by Congress** to *help millions of emancipated slaves and poor whites in the South in the aftermath of the Civil War.*

During its years of operation, the Freedmen's Bureau **fed millions of people, built hospitals and provided medical aid, negotiated labor contracts for ex-slaves and settled labor disputes. It also helped former slaves legalize marriages and locate lost relatives, and assisted black veterans.**

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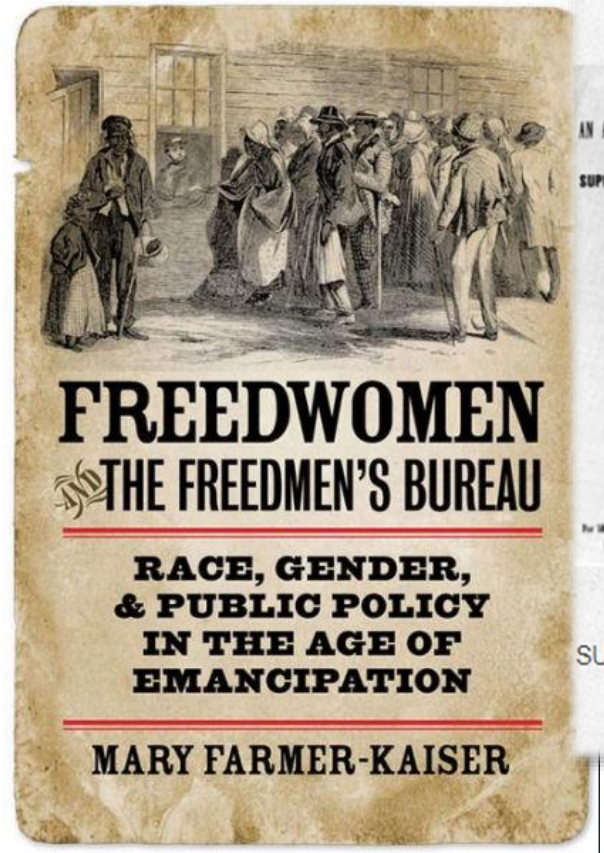
the "Bureau" *cont'd*

Intended to be a temporary organization to last the duration of the war and one year afterward (1865 - 1872), **the bureau failed to provide long-term protection or ensure any real measure of racial equality**. In the **summer of 1872, Congress dismantled the bureau** *due to a shortage of funds and personnel, along with the politics of race and Reconstruction.*



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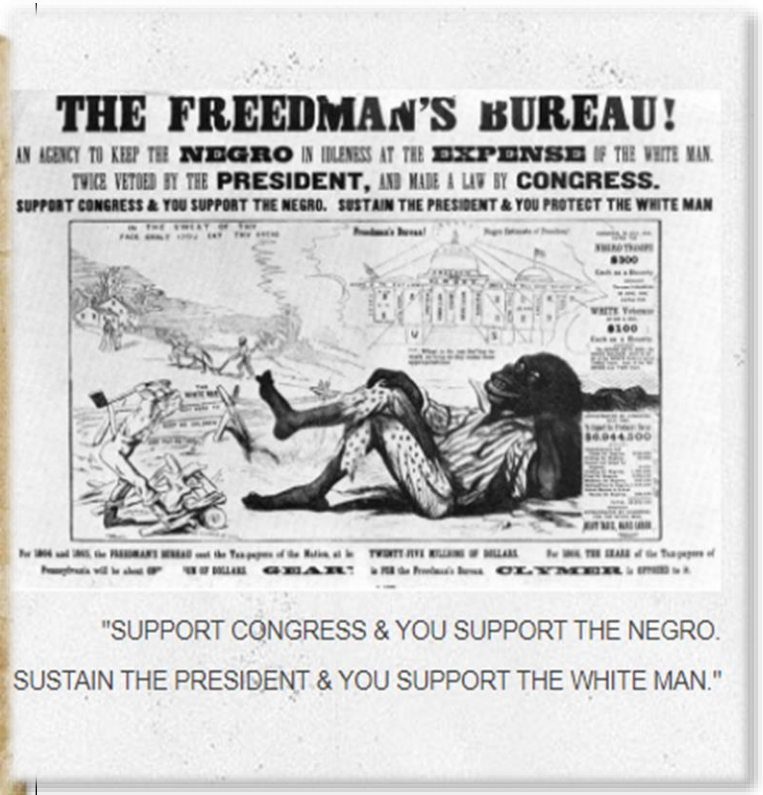

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Congressional Mandate

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the Freedmen's Bureau Preservation Act

In 2000, the U.S. Congress passed the Freedmen's Bureau Preservation Act, which *directed the National Archivist to preserve the extensive records of the Bureau on microfilm, and work with educational institutions to index the records*.

Announced on June 19th 2015, the Freedmen's Bureau Project was created as a partnerships between FamilySearch International and the National Archives and Records Administration (NARA), the National Museum of African American History and Culture, the Afro-American Historical and Genealogical Society (AAHGS), and the California African American Museum.

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Datasets

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the Freedmen's Bureau Records

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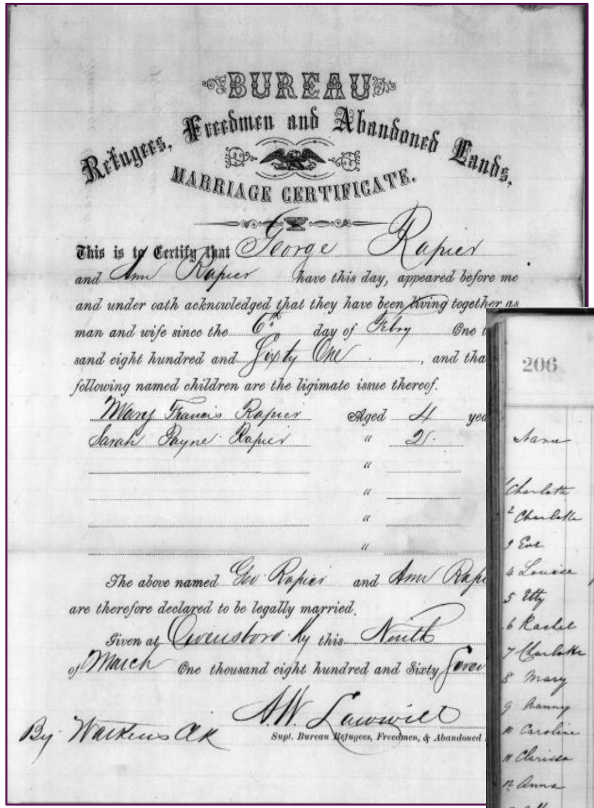
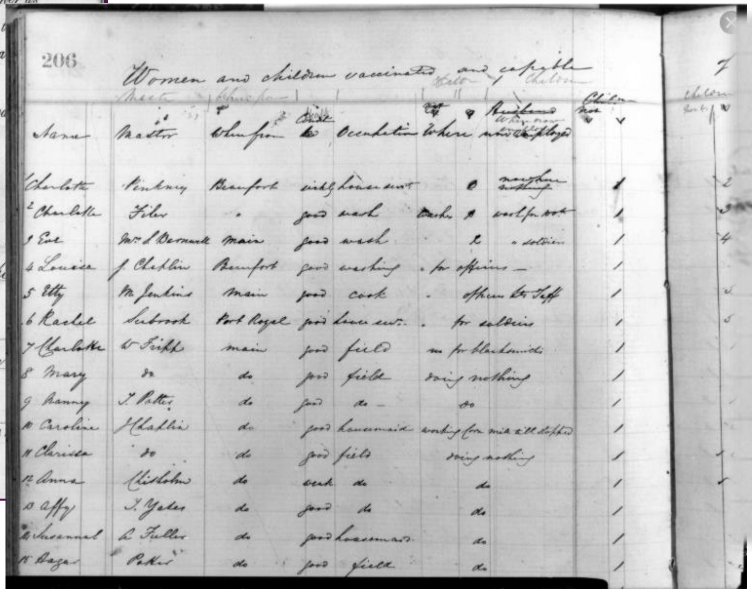

BUREAU
Refugees, Freedmen and Abandoned Lands,
MARRIAGE CERTIFICATE.
This is to Certify that George Raper
and Ann Raper have this day, appeared before me
and under oath acknowledged that they have been living together as
man and wife since the 6 day of Febry One
sand eight hundred and Forty One , and tha
following named children are the ligimate issue thereof.
Mary Francis Raper Aged 4 yea
Sarah Payne Raper " 21
The above named Geo Raper and Ann Rap
are therefore declared to be legally married.
Given at Greensboro this Ninth
of March One thousand eight hundred and Sixty Seve
A.W. Lawrence
Supt. Bureau Refugees, Freedmen, & Abandoned
By Watkins Clk

The **records constitute a major source of documentation on the operations of the Bureau, political and social conditions** in the Reconstruction Era, and one of the few recorded genealogies of freed people.

NARA provided access to the microfilms to the Smithsonian and FamilySearch to facilitate and fulfill the record preservation and indexing mandate.



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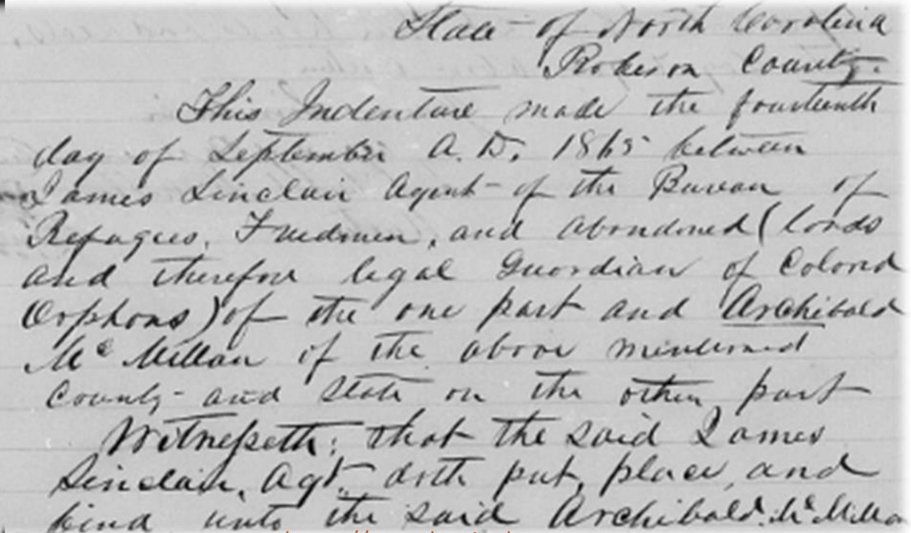
State of North Carolina
Robeson County.
This Indenture made the fourteenth
day of September A.D. 1865 between
James Sinclair Agent of the Bureau of
Refugees, Freedmen, and Abandoned Lands
and therefore legal Guardian of Colored
Orphans of the one part and Archibald
McMillan of the above mentioned
County and State on the other part
Witnesseth: that the said James
Sinclair, Agt. doth put, place, and
bind unto the said Archibald McMilla

https://nmaahc.si.edu

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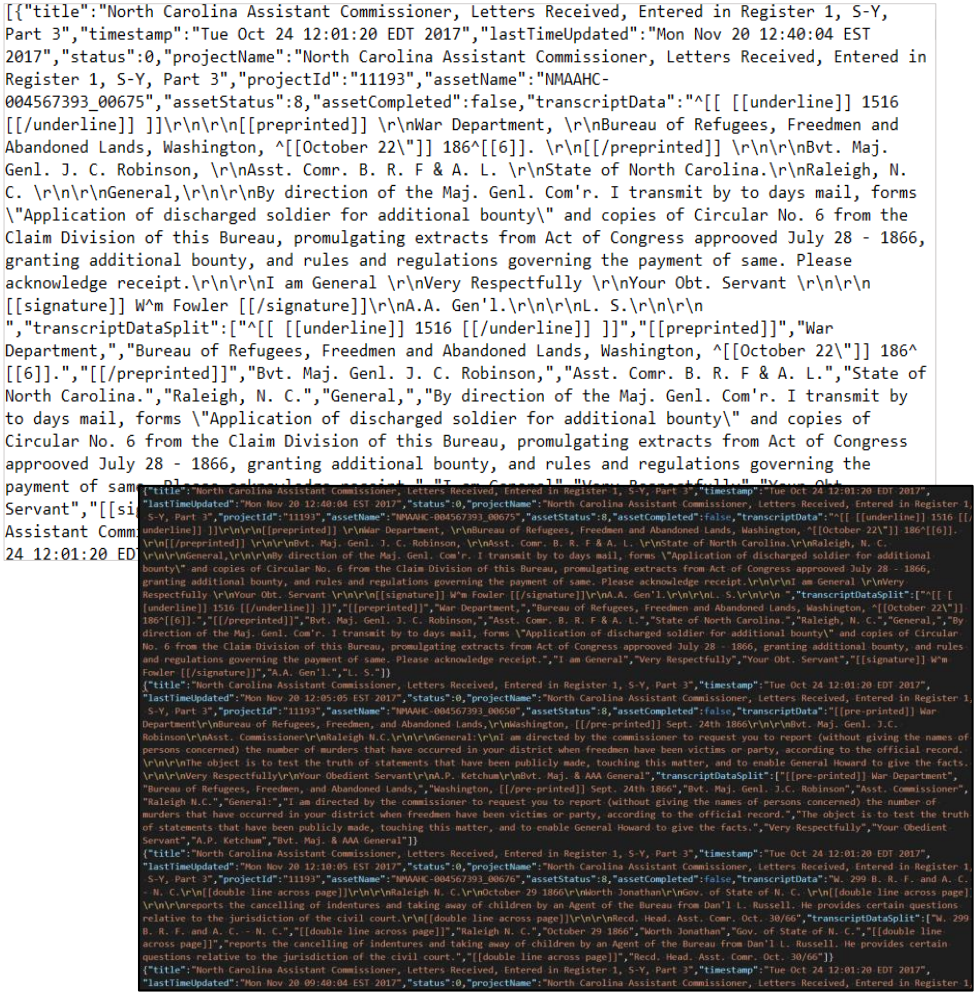
the Bureau Records | Smithsonian



DataSet #1: The **Smithsonian Transcription center** is a crowdsourcing project that allows volunteers [shameless CALL TO ACTION plug] to access microfilmed records which need to be transcribed into digital content.

To include the Bureau records, the Transcription center is tasked with digitizing all of the Institution's historic documents and collection records.

- **Data captured & transcribed**: *The complete record*.
- **Digital Storage**: Internal Enterprise Digital Asset Network [**EDAN**]
- **Digital Image Storage**: Internal Digital Asset Management System [**DAMS**]

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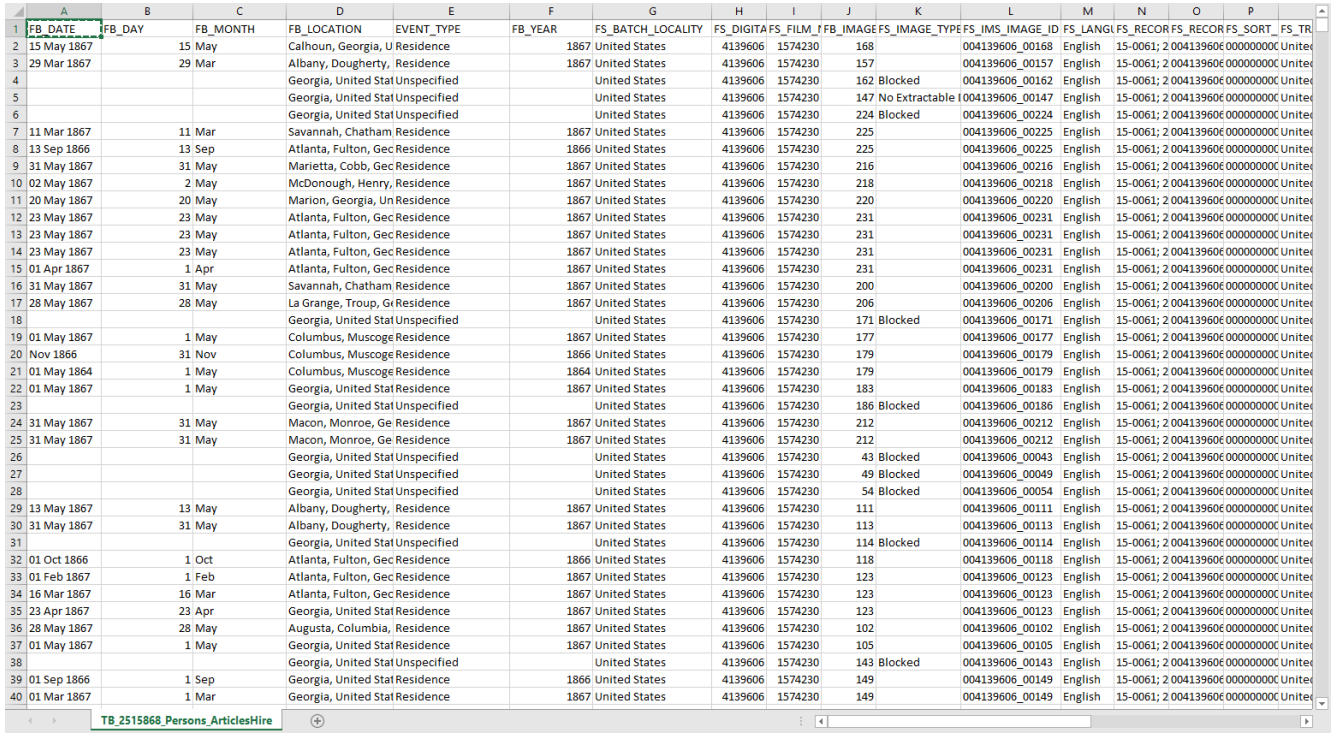
the Bureau Records | FamilySearch Intl

DataSet #2: A nonprofit family history organization run by the Church of Jesus Christ of the Latter-day Saints, FamilySearch International relies on its members to transcribe genealogy records as a free service to their members and service subscribers.



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			Georgia, United Stat	Unspecified		United States	4139606	1574230	162	Blocked	004139606_00162	English	15-0061; 2	004139606	000000000	Unite
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13 Sep 1866	13	Sep	Atlanta, Fulton, Geo	Residence	1866	United States	4139606	1574230	225		004139606_00225	English	15-0061; 2	004139606	000000000	Unite
31 May 1867	31	May	Marietta, Cobb, Geo	Residence	1867	United States	4139606	1574230	216		004139606_00216	English	15-0061; 2	004139606	000000000	Unite
02 May 1867	2	May	McDonough, Henry,	Residence	1867	United States	4139606	1574230	218		004139606_00218	English	15-0061; 2	004139606	000000000	Unite
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23 May 1867	23	May	Atlanta, Fulton, Geo	Residence	1867	United States	4139606	1574230	231		004139606_00231	English	15-0061; 2	004139606	000000000	Unite
23 May 1867	23	May	Atlanta, Fulton, Geo	Residence	1867	United States	4139606	1574230	231		004139606_00231	English	15-0061; 2	004139606	000000000	Unite
01 Apr 1867	1	Apr	Atlanta, Fulton, Geo	Residence	1867	United States	4139606	1574230	231		004139606_00231	English	15-0061; 2	004139606	000000000	Unite
31 May 1867	31	May	Savannah, Chatham	Residence	1867	United States	4139606	1574230	200		004139606_00200	English	15-0061; 2	004139606	000000000	Unite
28 May 1867	28	May	La Grange, Troup, G	Residence	1867	United States	4139606	1574230	206		004139606_00206	English	15-0061; 2	004139606	000000000	Unite
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Nov 1866	31	Nov	Columbus, Muscoge	Residence	1866	United States	4139606	1574230	179		004139606_00179	English	15-0061; 2	004139606	000000000	Unite
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23 Apr 1867	23	Apr	Georgia, United Stat	Residence	1867	United States	4139606	1574230	123		004139606_00123	English	15-0061; 2	004139606	000000000	Unite
28 May 1867	28	May	Augusta, Columbia,	Residence	1867	United States	4139606	1574230	102		004139606_00102	English	15-0061; 2	004139606	000000000	Unite
01 May 1867	1	May	Georgia, United Stat	Residence	1867	United States	4139606	1574230	105		004139606_00105	English	15-0061; 2	004139606	000000000	Unite
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01 Sep 1866	1	Sep	Georgia, United Stat	Residence	1866	United States	4139606	1574230	149		004139606_00149	English	15-0061; 2	004139606	000000000	Unite
01 Mar 1867	1	Mar	Georgia, United Stat	Residence	1867	United States	4139606	1574230	149		004139606_00149	English	15-0061; 2	004139606	000000000	Unite

TB_2515868_Persons_ArticlesHire

- Data captured & transcribed: *Demographic Info*
- Digital Content Storage: Internal Database
- Digital Image Storage: Web Accessible URL

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Data Consolidation Challenges

FamilySearch Data: Data received from FamilySearch was **captured** & **stored as thirteen (13) comma-delimited files with a combined record count of six (6) million entries.**

Unedited and viewed in **spreadsheet format uncovered that across all the data not one collection set shared a single piece of common data** (::groan::: no primary key).

Also revealed - a number of "what not to do" with tabular & normalized data

- Blank cells & null values versus filler zeros
- Transcription formatting wonkiness
- Multiple pieces of information captured in a single cell
- Problematic field names
- Special characters mixed with the data
- Inclusion of metadata information
- Varied date formats

SI Transcription Center Data: Data received from SI is served from EDAN in JSON format but not accessible via client URL.

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Searchability

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FB Digital Record Search

Learn more about this project at the SI Transcription Center

```
Egerton. Jos. J. | C.149
Eaton. W.A. | W.356-H.249
Eddy Jas | D.118
Elyard Danl. | W.361
Evans Amy | W.386.-387
Epps James | W.248
Evans Edward | N.85
Evans Miss | C.169
```

Records of the Assistant Commissioner for the State of North Carolina, Bureau of Refugees, Freedmen and Abandoned Lands, 1865-1870

Registers of letters received, name index (4) to register 2

Danl Elyard

RECORDS OF:
Assistant Commissioner | North Carolina

PUBLICATION NUMBER:
M843

ASSET NAME:
NMAAHC-004567389_00223

The Project received financial support from a donor to create a place within the museum – Family History Center – where visitors could sit and search the records for family members who may have been displaced during this era.

This **required that the two datasets be combined and the records be matched to cross-reference** (as much as possible) **each other.**

The purpose of the combined datasets was **to provide researchers & visitors with a richer and more complete representation of the records and family history**.

Additional Benefit: Mapping the demographic information with the complete transcript and stored images could possibly uncover trends during the Reconstruction Era e.g. diseases among the population at that time.

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Feature set: Adding Findability

Supporting Technology:

- SOLR 7.4 with custom schema
- Application Language: Angular 7.x

Extensive understanding of the content in order to make judgement calls during cleanup: **Consultation with Genealogist & SME Curator**

Dream-worthy amount of Data Clean-up

Sifting through each record to verify data consistency; *did I mention there are 6 million records*?

- Splitting multiple pieces of data
- Standardizing column headers** & making these the indexable fields in SOLR
- Creating a composite key: autoincremented ID column + contrived CollectionID
- Removing beginning spaces

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Made it so…

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2	6191870	NMAAHC-004567385_00037	004567385_00037	https://ids.si.edu/ids/de	Letters sent: Name index t	Letters sent, name in	004567385_	Records of the Assistant C	Assistant Commissioner	North Carolina
3	6191870	NMAAHC-004567385_00037	004567385_00037	https://ids.si.edu/ids/de	Letters sent: Name index t	Letters sent, name in	004567385_	Records of the Assistant C	Assistant Commissioner	North Carolina
4	6191870	NMAAHC-004567385_00037	004567385_00037	https://ids.si.edu/ids/de	Letters sent: Name index t	Letters sent, name in	004567385_	Records of the Assistant C	Assistant Commissioner	North Carolina
5	6191870	NMAAHC-004567385_00037	004567385_00037	https://ids.si.edu/ids/de	Letters sent: Name index t	Letters sent, name in	004567385_	Records of the Assistant C	Assistant Commissioner	North Carolina
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7	6191870	NMAAHC-004567385_00037	004567385_00037	https://ids.si.edu/ids						
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12	6191870	NMAAHC-004567385_00044	004567385_00044	https://ids.si.edu/ids						
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31	6191870	NMAAHC-004567385_00039	004567385_00039	https://ids.si.edu/ids						
32	6191870	NMAAHC-004567385_00040	004567385_00040	https://ids.si.edu/ids						
33	6191870	NMAAHC-004567385_00041	004567385_00041	https://ids.si.edu/ids						
34	6191870	NMAAHC-004567385_00041	004567385_00041	https://ids.si.edu/ids						

```
<!--- NMAAHC - Freedmens Bureau Records Fields -->

<field name="FB_FULL_NAME" type="string" multiValued="true" indexed="true" stored="true"/>
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<field name="FB_MONTH" type="tdate" multiValued="true" indexed="true" stored="true"/>
<field name="FB_COUNTY" type="string" multiValued="true" indexed="true" stored="true"/>
<field name="FB_LOCATION" type="string" multiValued="true" indexed="true" stored="true"/>
<field name="FB_IMAGE_APID" type="string" multiValued="false" required="true" indexed="true"
stored="true"/>
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<field name="FS_IMAGE_PAL" type="string" multiValued="true" indexed="true" stored="true"/>
<field name="text_g" type="text_general" indexed="true" stored="true" />
<field name="text_s" type="string" indexed="true" stored="true" />

<field name="BR_FULL_NAME" type="string" multiValued="true" indexed="true" stored="true"/>
<field name="BR_FIRST_NAME" type="string" multiValued="true" indexed="true" stored="true"/>
<field name="BR_LAST_NAME" type="string" multiValued="true" indexed="true" stored="true"/>
<field name="GR_FULL_NAME" type="string" multiValued="true" indexed="true" stored="true"/>
<field name="GR_FIRST_NAME" type="string" multiValued="true" indexed="true" stored="true"/>
<field name="GR_LAST_NAME" type="string" multiValued="true" indexed="true" stored="true"/>
<field name="FB_MARRIAGE_PLACE" type="string" multiValued="true" indexed="true" stored="true"/>
```

NATIONAL MUSEUM of AFRICAN AMERICAN HISTORY & CULTURE

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DEMO

Freedmen's Bureau Digital Record Search: *fbsearch.nmaahc.si.edu*

Smithsonian
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Next Steps & //TODOs

Smithsonian
National Museum of African American History and Culture

BugFixes, Refactors & Enhancements *oh my*

NEXT Steps

Creating an open-source API to make the csv records & EDAN data available to the public without exposing internal bits.

- **Use case:** Regional Chamber of Congress or Museum who wants limit records for a specific state.
- **Use case:** Family historian who wants to limit records for a specific surname
- And **other use cases** that I cannot fathom

//TODOs 2 GET /there

BugFixes

- Address **performance** issues
- Wonky mobile view
- Adding **SSL certs**
- Additional **security to SOLR**

Refactor

- Front-end technology [Angular/React/?]
- Change up back-end [Nodejs + GraphQL]
- Adding a back-end data store [redis/mongoDB]

Enhancements

- Pretty-fying UI while maintaining branding
- Adding more whiz-banginess
- Transition dev workflow => CI/CD pipeline

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Questions??

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the Taming of the Unstructured Data

Rayvn Manuel

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