

# Library Linked Data

PRATT INFO-653

Knowledge Organization

NOV 29, 2022

JACKIE SHIEH

# Your answer

- ▶ As a ... <your role>
- ▶ How do you define linked data?
- ▶ What do you expect from linked open data?

# Topics

- Linked data
  - History, semantics, syntax, serializations
  - URIs vs dereferenceable URIs
- Library community's LOD projects
  - IFLA LRM, RDA/RDF, BIBFRAME
  - BIBFRAME Implementations (Sinopia (PCC Libraries), Share-VDE, Sweden, Hungary)
  - Thesauri, vocabularies, ontologies (FAST, VIAF, authority files (LoC, DNB's GND), MeSH, Getty vocabularies)
- Linked open data platform
  - Wikidata

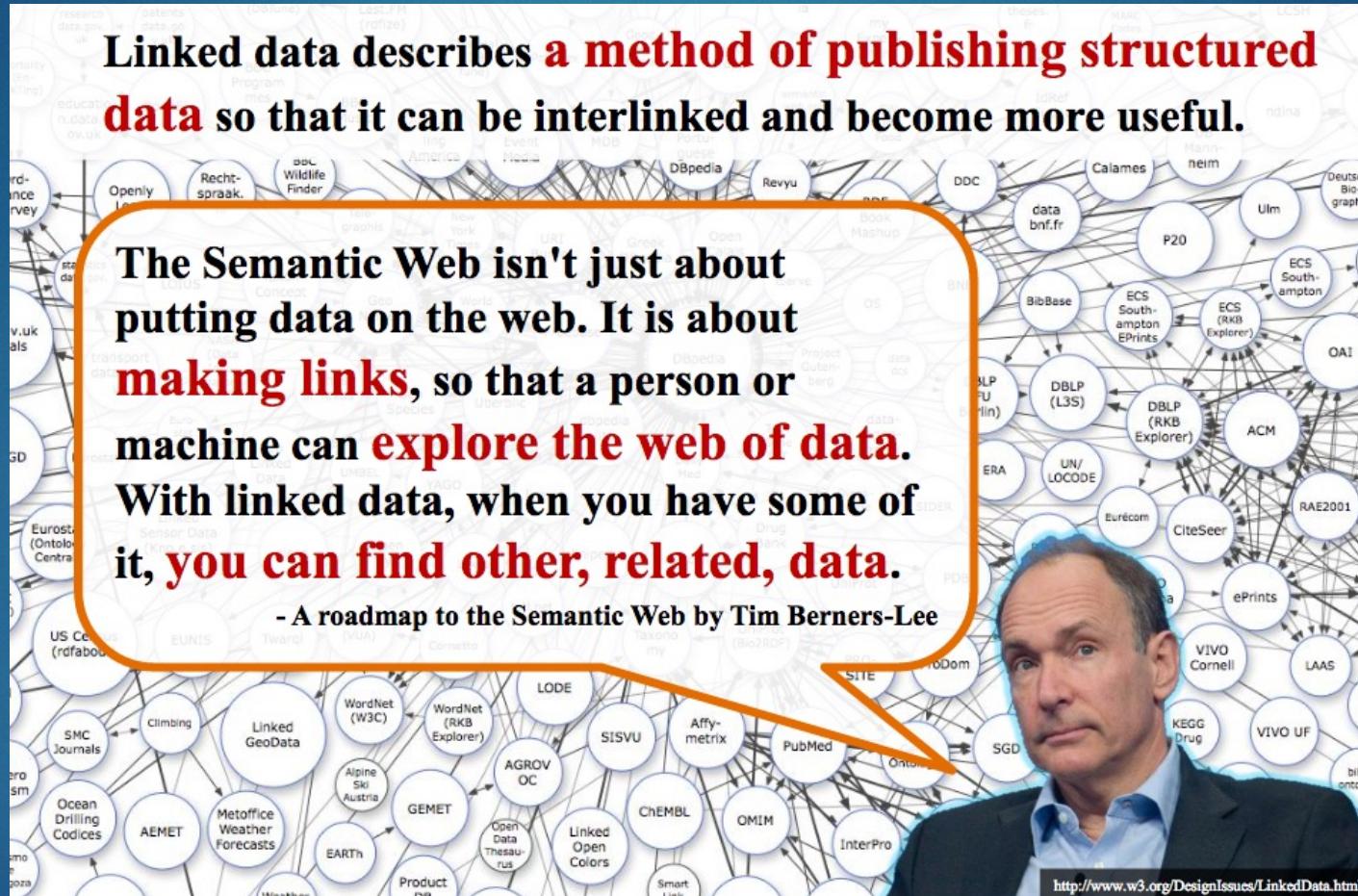
# Linked Data



# Things to consider

- ▶ Why Linked data?
- ▶ What is Resource Description Framework (RDF)?
- ▶ What is a Uniform Resource Identifier (URI)?
- ▶ What is a dereferenceable (RDF) URI?
- ▶ What skills will be needed?

# ► Why Linked data



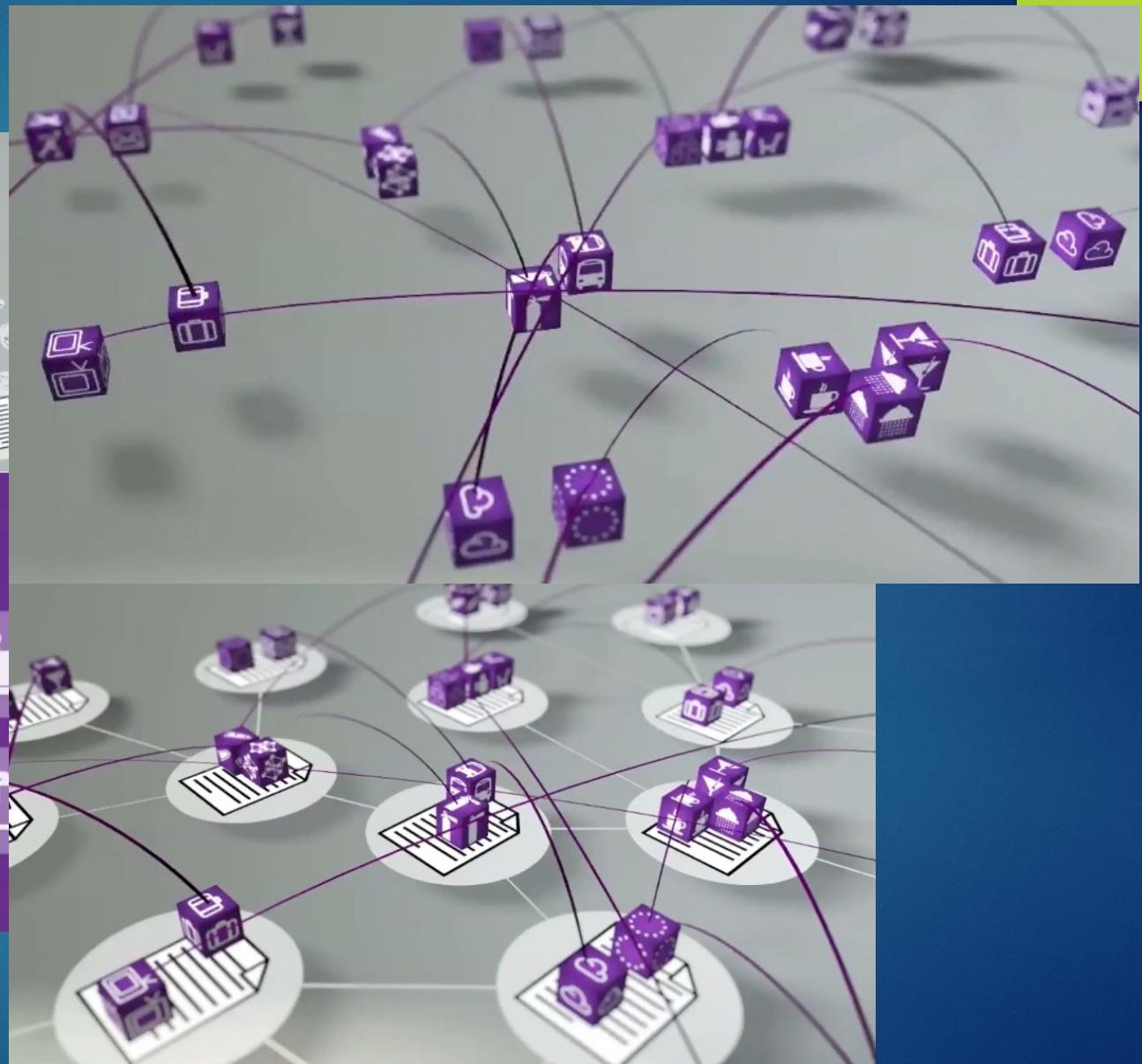
# Linked data principles

- ▶ Use URIs for names for THINGS
- ▶ Use HTTP URIs for lookup
- ▶ Use open standards (e.g. RDF) in non-proprietary formats
- ▶ Include links to other URIs

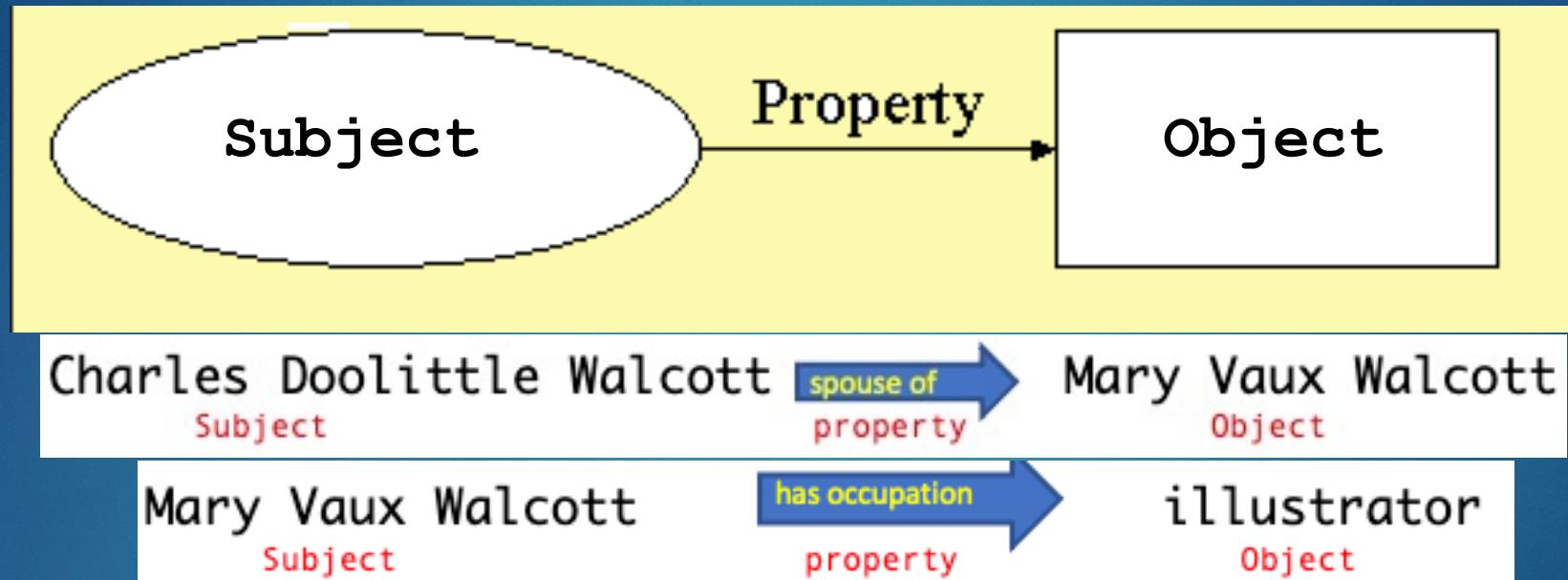


<http://w3.org/DesignIssues/LinkedData.html>

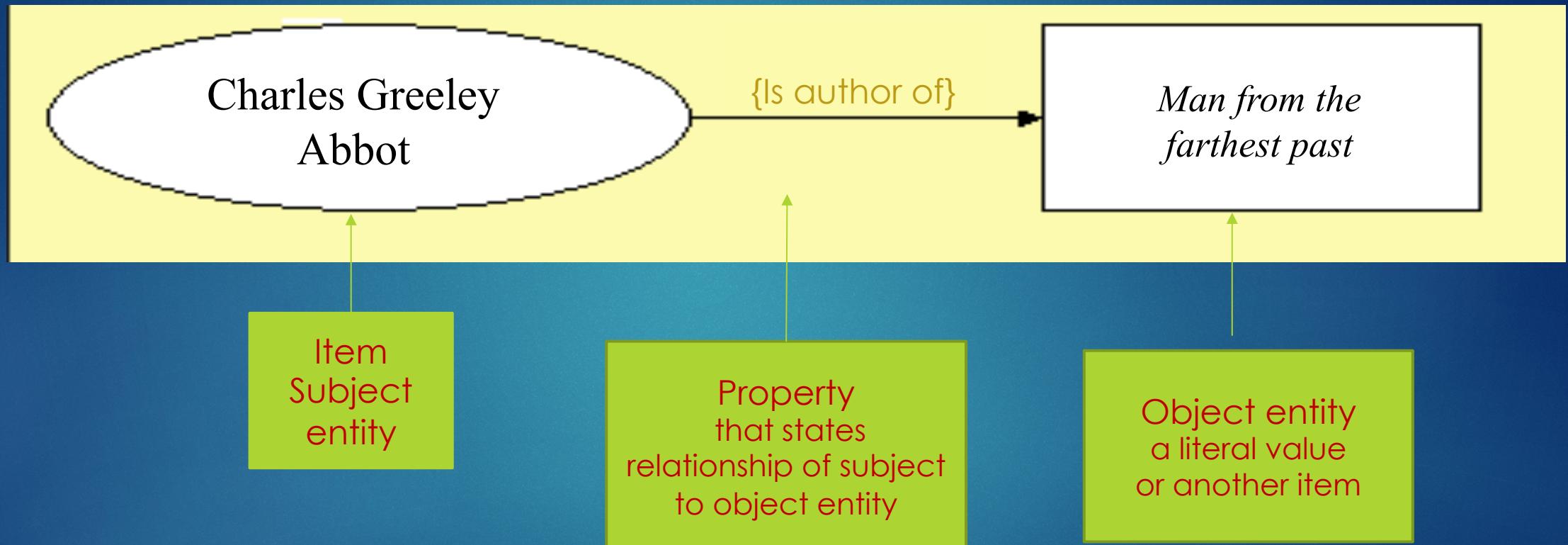
# First things first



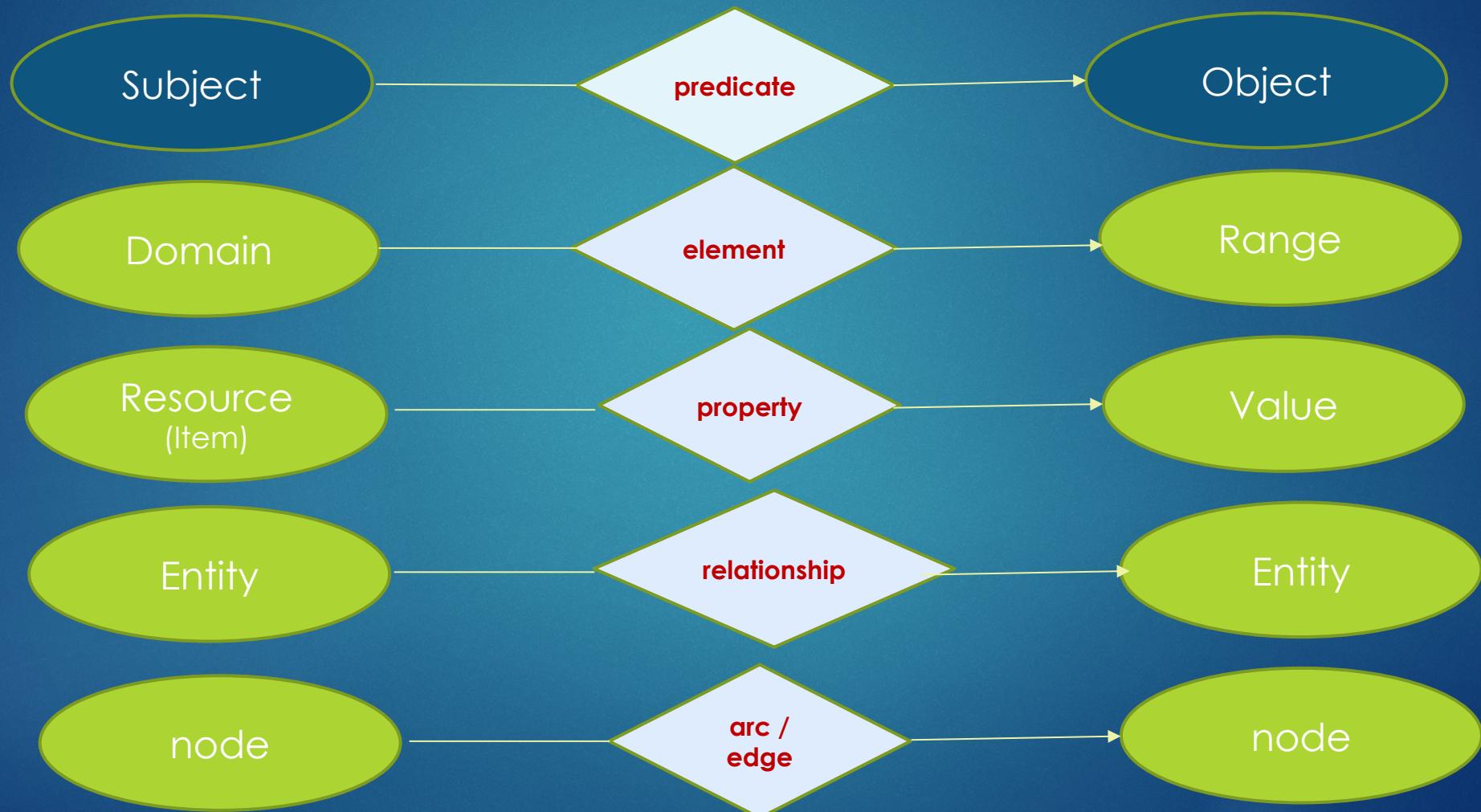
# ► What is Resource Description Framework (RDF)



# An entity statement



# RDF applications



# ►What is a Uniform Resource Identifier (URI)

A **Uniform Resource Identifier (URI)** is a **string** of characters that unambiguously **identifies** a particular **resource**. To guarantee **uniformity**, all URIs follow a predefined set of syntax rules,<sup>[1]</sup> but also maintain **extensibility** through a separately defined **hierarchical naming scheme** (e.g. <http://>).

scheme:[//authority(DNS)]path[?query][#fragment]

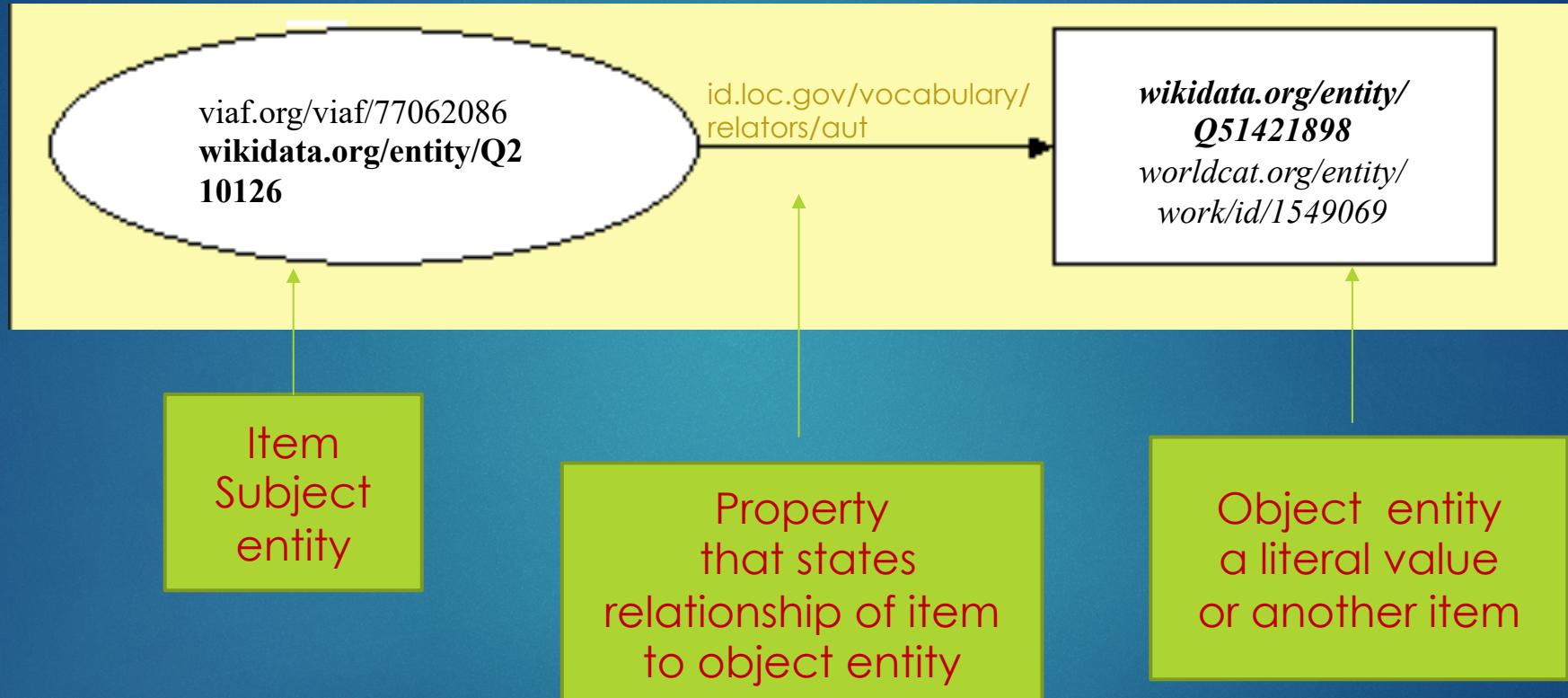
Types	Example
URN	<b>urn:isbn:0-476-27557-4</b>
URL	<b>https://www.pratt.edu</b>

# ►What is a dereferenceable URI

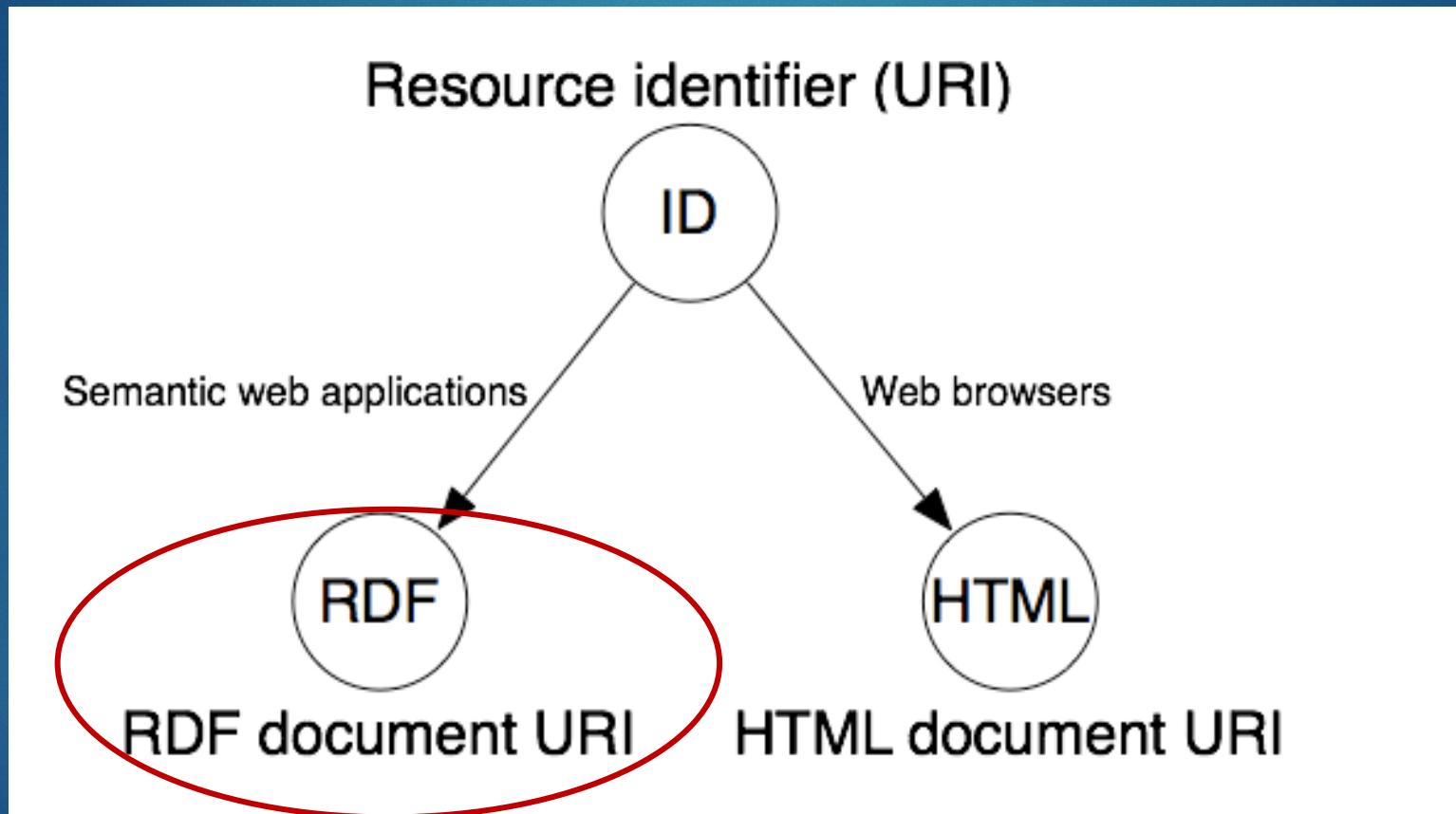
use Web protocols to retrieve a representation of the resource the URI identifies

Scheme/Protocol	Description
ftp	File Transfer Protocol
http/https	Hyper text transfer protocol (Secure)
mailto	Electronic mail address
ssh	Secure shell
tel	telephone
urn	Uniform Resource Names

# URI replacing label



# Not all URIs are equal



# RDF serializations

- ▶ RDF/XML
- ▶ RDFa
- ▶ JSON-LD (JavaScript Object Notation  
Linked Data)
- ▶ N3 (Notation 3)
- ▶ TTL (*Turtle, Terse RDF Triple Language*)

# ► Exercise: RDF URLs vs URLs

## Mary Vaux Walcott

- ▶ LoC's Linked data service
  - ▶ <http://id.loc.gov/authorities/names/n86012335>
- ▶ VIAF
  - ▶ <http://viaf.org/viaf/43313923>
- ▶ BnF
  - ▶ <http://data.bnf.fr/17899334>
- ▶ DNB
  - ▶ <http://d-nb.info/gnd/1098348362>
- ▶ Wikidata
  - ▶ <http://wikidata.org/entity/Q6780882>
- ▶ DbPedia
  - ▶ [http://dbpedia.org/resource/Mary\\_Vaux\\_Walcott](http://dbpedia.org/resource/Mary_Vaux_Walcott)
- ▶ FAST
  - ▶ <http://id.worldcat.org/fast/195746>

# ► Knowledge and skills

- ▶ Record- (cataloging) to entity-based (modelling) descriptive data
- ▶ Fundamentals of RDF and Linked data
- ▶ Management of identities and linking among them
- ▶ Ability to design, maintain, publish, and map RDF vocabularies and application profiles
- ▶ Ability to create, transform and interact with RDF data
- ▶ Ability to generate linked data applications

## ► Your answer...

- Are you enthusiastic about the change?
- What is the RDF data model and components?
- Are you comfortable with the principles of things with URI?
- Can you shed light on a URI pointing to a thing and one pointing to a page about the thing?



Cataloging standards  
in transition

Entity-Relationship

## ► Library community's efforts

- ▶ IFLA's functional requirements data models
- ▶ Library of Congress's Bibliographic Framework (BIBFRAME)
- ▶ JSC's Resource Description & Access (RDA) 3-R project (restructure and redesign)
- ▶ LD4 projects

## ► IFLA's conceptual models

- ▶ 1998: Functional Requirements for Bibliographic Records (FRBR)
- ▶ 2009: Functional Requirements for Authority Data (FRAD)
- ▶ 2010: Functional Requirements for Subject Authority Data (FRSAD)

# ► IFLA Library Reference Model (LRM)

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Entity Hierarchy		
Top Level	Second Level	Third Level
LRM-E1 RES		
--	LRM-E2 Work	
--	LRM-E3 Expression	
--	LRM-E4 Manifestation	
--	LRM-E5 Item	
--	LRM-E6 Agent	
--	--	LRM-E7 Person
--	--	LRM-E8 Collective Agent
--	LRM-E9 Nomen	
--	LRM-E10 Place	
--	LRM-E11 Time-span	

[http://ofla.org/files/assets/cataloguing/frbr-lrm/ifla-lrm-august-2017\\_rev201712.pdf](http://ofla.org/files/assets/cataloguing/frbr-lrm/ifla-lrm-august-2017_rev201712.pdf)

# ►RDA Entity model

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## RDA Entities

- RDA Entity
  - Note capital “E”
- Work
- Expression
- Manifestation
- Item
- Place
- Agent
- Person
- Collective Agent
- Corporate Body
- Family
- Nomen
- Timespan

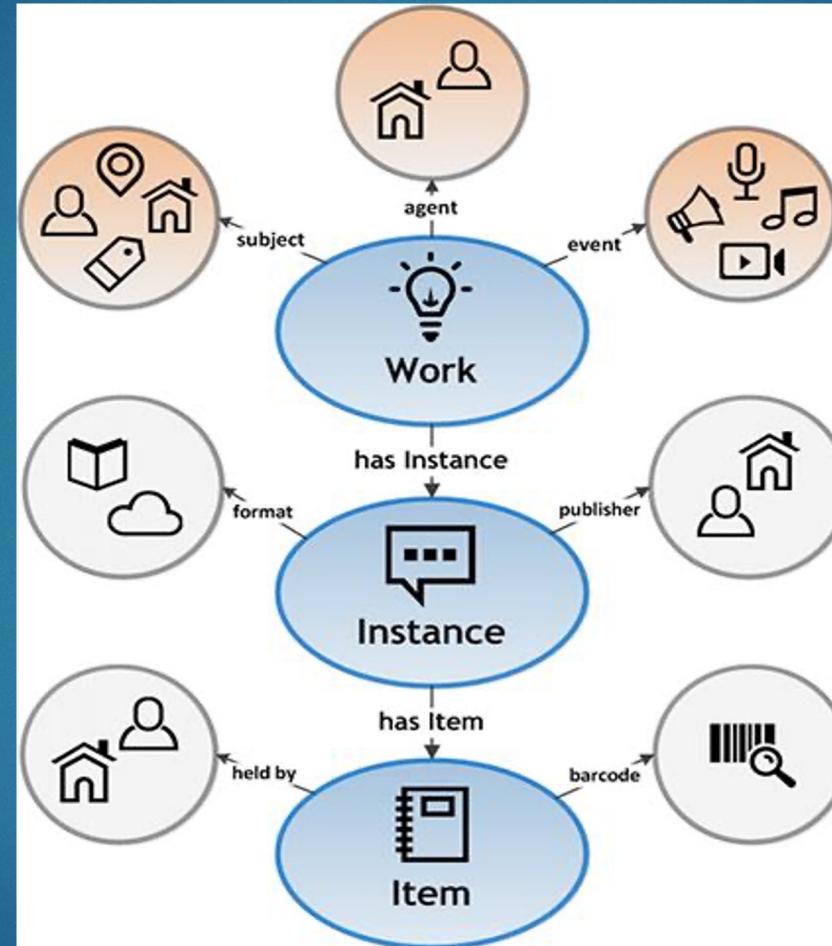
- **entity subtype**
- **entity supertype**

# ►RDA Terminology:

## Domain — element — Range

- ▶ Domain—The RDA entity that is described by an element
- ▶ Range—The RDA entity that is the value of a relationship element
- ▶ Element—Every element in RDA has a Domain but only relationship elements have a Range

# ►BIBFRAME: bibliographic data model



<http://loc.gov/bibframe/docs/bibframe2-model.html>

# ►LC BIBFRAME Implementation

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- FY 2022: accommodates 350 catalogers cataloging in BIBFRAME Editor five days a week
- Conversion processes in place
  - MARC2BIBFRAME
  - BIBFRAME2MARC

[http://www.casalini.it/bfwe2021/web\\_content/2021/presentations/mccallum.pdf](http://www.casalini.it/bfwe2021/web_content/2021/presentations/mccallum.pdf)

# ► BIBFRAME implementations

## ► LD4 Sinopia

sinopia.io

## ► National Library of Sweden (BF +)

[tinyurl.com/SwedenBF](http://tinyurl.com/SwedenBF)

## ► National Széchényi Library of Hungary

## ► Share VDE (virtual discovery environment)

svde.org

## ► Thesauri & vocabularies

- Identity services (LoC, DNB's GND, BnF's FNE)
- OCLC's FAST, VIAF, Classify, Identities, CONTENTdm
- NLM's MeSH
- Getty vocabularies (AAT, ULAN)
- Many more

# ► BIBFRAME editors

## ► Marva

<https://bibframe.org/marva/editor/>

## ► Sinopia

<https://sinopia.io>

# Exercise

String-based → Entity-centric description

# ►Text-centric system

## □ Pride and prejudice / Jane Austen.

### Record info:

Main Author [Austen, Jane, 1775-1817.](#)

Published/Created 2007 - Ann Arbor, MI : Borders Classics,

Language English

Subjects (LCSH) [Courtship -- Fiction.](#)

[Show all 5](#)

100 1\_ |a Austen, Jane, |d 1775-1817

370 \_ |a Steventon (Hampshire, England) |b Winchester (England) |c England |c Great Britain |e Bath (England) |2 naf

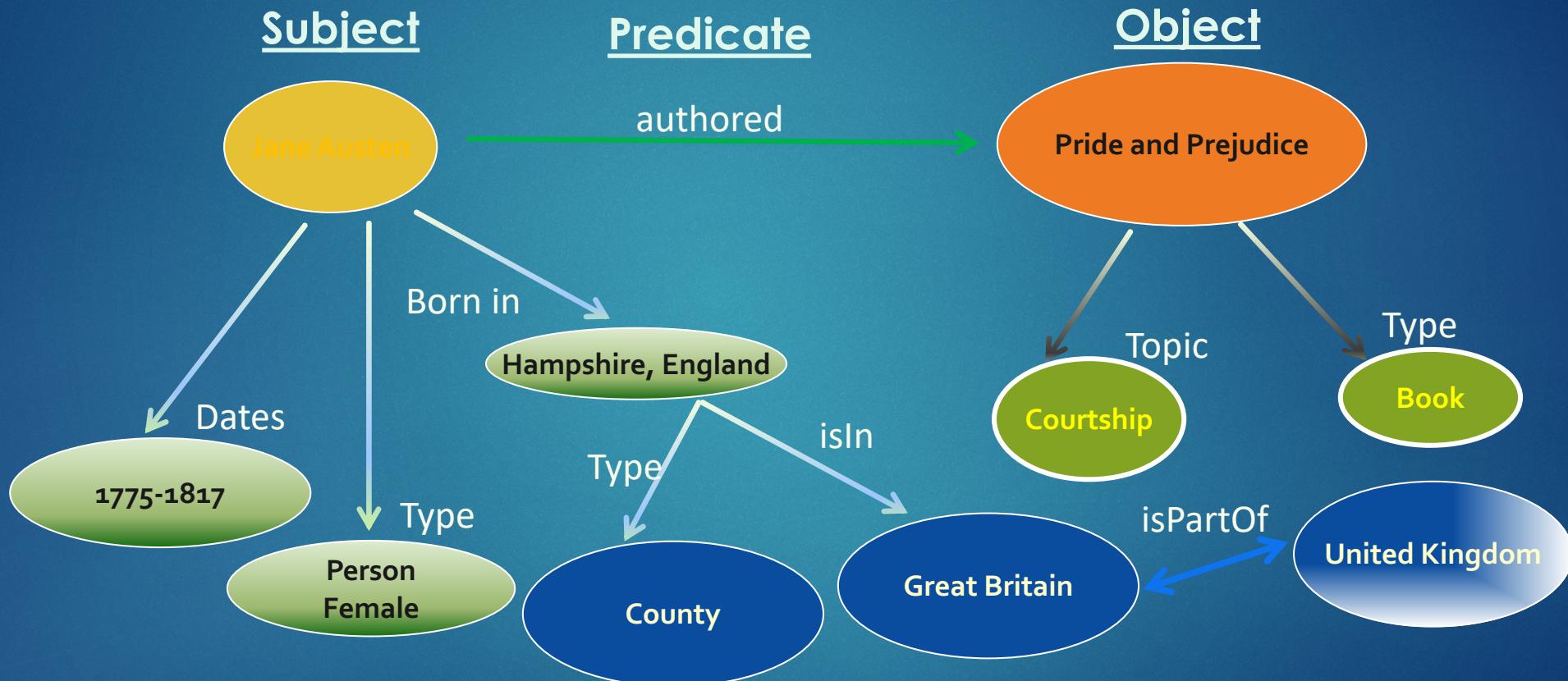
372 \_ |a Fiction |2 lcsh

374 \_ |a Authors |a Novelists |2 lcsh

375 \_ |a female

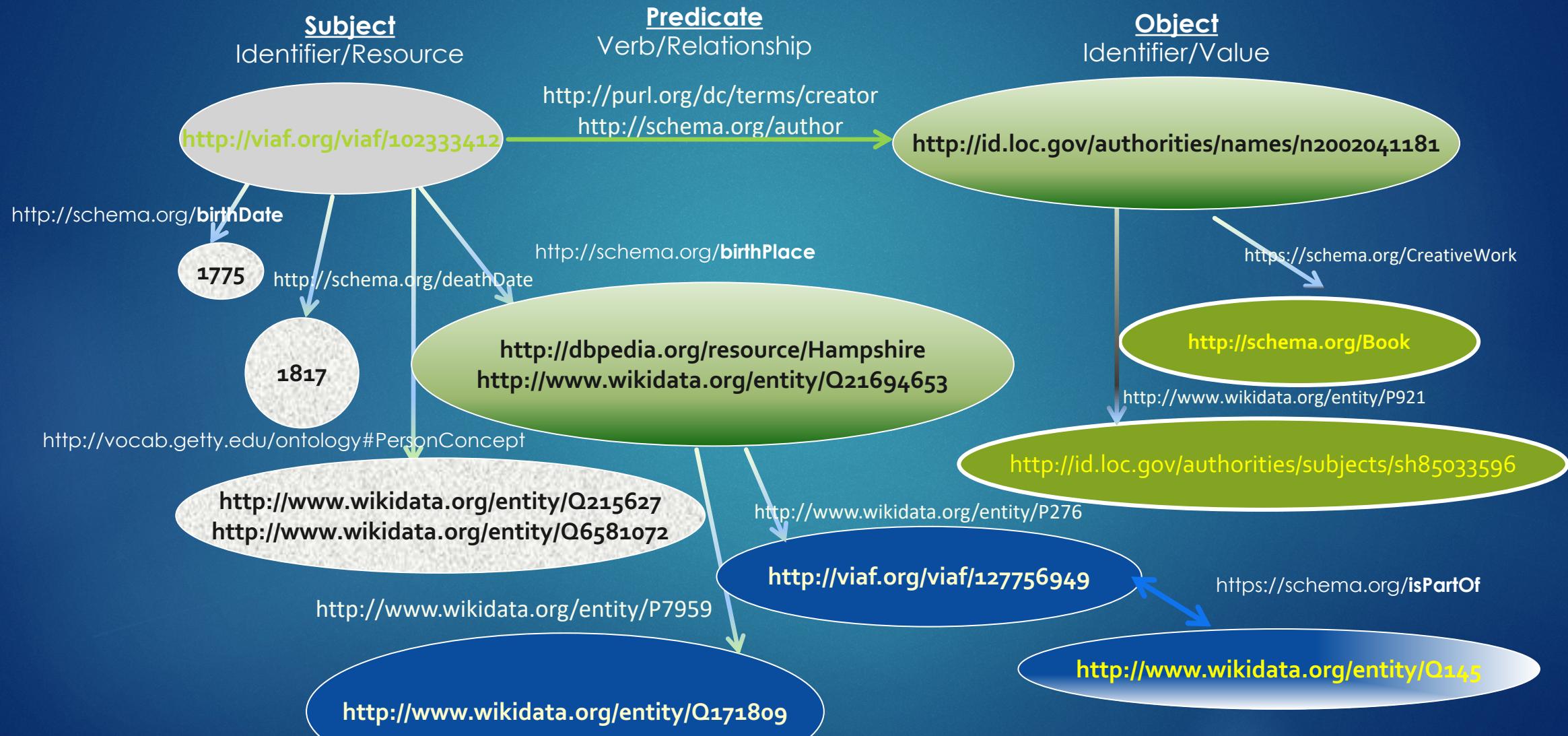
377 \_ |a eng

# Entity-Relationship



# HTTP URIs

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► Exercise:

Locate RDF URI for your choice of a triple statement

- Person
- Work
- Location
- Concept



# Question?

# Wiki platform

# Common terms

- ▶ **Wiki** – a collaborative platform for writing and publishing via a user agent (e.g., browser)
- ▶ **Wikipedia** – a collaboratively edited, multilingual, free Internet encyclopedia supported by the non-profit Wikimedia Foundation
- ▶ **Wikidata** – a *global database (repository), hosting structured data in triples*
- ▶ **Triple statement** – "this" "is" "that" (subject item (Q#))—property (P#)—object item (Q#))
- ▶ **Wikibase** – a software that powers Wikidata, which supports structured data

# Common terms (cont.)

- ▶ **Data modeling** – analyze data requirements to support logic, structure, discoverability, context, etc.
- ▶ **Serialization** – flavors of data output formats (e.g., RDF/XML, JSON, TTL, N3, etc.)
- ▶ **Visualization** – visual forms of data representation (e.g., tables, charts, maps, etc.)
- ▶ **Node** – an active, physical device attached to a network, capable of transmitting data

# Wikimedia family

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<http://mediawiki.org>



[meta.wikimedia.org/wiki/Wikimedia\\_movement#/media/File:Wikimedia\\_logo\\_family\\_complete-2021.svg](https://meta.wikimedia.org/wiki/Wikimedia_movement#/media/File:Wikimedia_logo_family_complete-2021.svg)



**Online encyclopedia** a free content, multilingual online encyclopedia contributed by a community of volunteer on an open collaboration, wiki-based editing system, and supported by Wikidata



<http://commons.wikimedia.org>

a **media repository**, of freely available and reusable media files, in all languages, supporting all Wikimedia projects, e.g., Wikipedia, Wikivoyage, Wikisource, Wikiquote, Wiktionary, Wikinews, Wikibooks, and Wikispecies



<http://wikidata.org>

To collect world's knowledge in a structured manner to benefit all who seek knowledge

**data repository** that is open, free, collaborative, and multilingual, which collects structured data to support Wikipedia, Wikimedia Commons, and many other Wiki projects

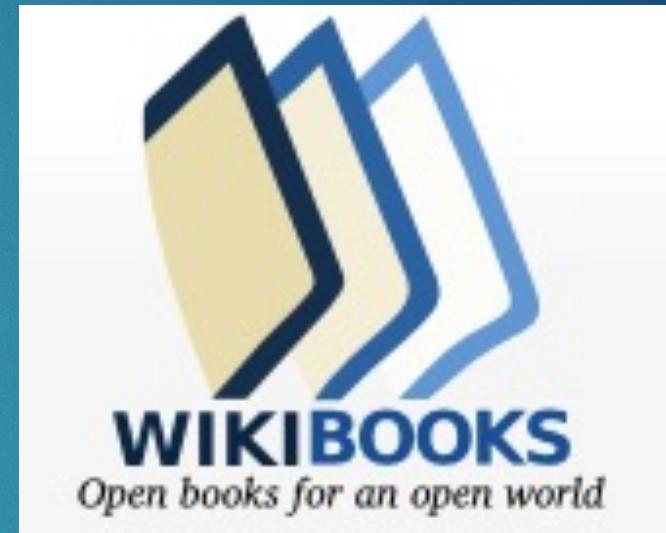
item	property	value
Marie Curie	field of work	chemistry
Q7186	P101	Q2329

an **online digital library** of multidisciplinary open-content ebook library in 72 languages, over 500K English texts among others, comics, and audio books



<http://wikisource.org>

a collection of open-content textbooks; including annotated texts, instructional guides, and manuals



<https://en.wikibooks.org>

# Interconnectivity

**Robert Louis Stevenson**

From Wikipedia, the free encyclopedia

Robert Louis Balfour Stevenson (13 November 1850 – 3 December 1894) was a Scottish novelist, poet, essayist, and travel writer. His most famous works are *Treasure Island*, *Kidnapped*, *Strange Case of Dr Jekyll and Mr Hyde* and *A Child's Garden of Verses*.

A literary celebrity during his lifetime, Stevenson now ranks among the 26 most translated authors in the world.<sup>[1]</sup> His works have been admired by many other writers, including Jorge Luis Borges, Bertolt Brecht, Marcel Proust, Arthur Conan Doyle, Henry James, Cesare Pavese, Ernest Hemingway, Rudyard Kipling, Jack London, Vladimir Nabokov,<sup>[2]</sup> J. M. Barrie,<sup>[3]</sup> and G. K. Chesterton, who said of him that he "seemed to pick the right word up on the point of his pen, like a man playing spilleskis".<sup>[4]</sup>

```

graph TD
    W[WIKIPEDIA  
The Free Encyclopedia] <--> WC[WIKIMEDIA COMMONS]
    W <--> WS[WIKISOURCE]
    W <--> WD[WIKIDATA]
    WC <--> WD
    WS <--> WD
    subgraph RobertLouisStevenson [ROBERT LOUIS STEVENSON (Q1512)]
        direction TB
        S[Spouse (P26): Fanny Stevenson Q3066501] &nbsp;
        P[Place of birth (P19): Edinburgh Q23436] &nbsp;
        D[Place of death (P20): Vailima, Samoa Q548806] &nbsp;
        F[Father (P22): Thomas Stevenson Q325068] &nbsp;
        E[Educated at (P69): Edinburgh Uni Q160302] &nbsp;
        O[Occupation (P106): Writer Q38180  
Poet Q49757  
Novelist Q6625963  
Essayist Q11774202]
    end

```

**Works** [edit | edit source]

**Novels** [edit | edit source]

- Treasure Island (1883)
- Prince Otto (1885)
- Strange Case of Dr Jekyll and Mr Hyde (1886)
  - The Annotated Strange Case of Dr Jekyll and Mr Hyde
- Kidnapped (*Adventures of David Balfour*, 1886)
- The Black Arrow (1888)
- The Master of Ballantrae (1889) (External scan)
- Catriona (*Adventures of David Balfour*, 1893)
- Weir of Hermiston (1896, unfinished)
- St. Ives (1898, unfinished)

with Lloyd Osbourne [edit | edit source]

- The Wrong Box (1889) (External scan)
- The Wrecker (1892)
- The Ebb-Tide (1894) (External scan)

**Short stories** [edit | edit source]

- A Lodging for the Night (1877)
- The Sire de Maletroit's Door (1878)

Public Domain pic of Robert Louis Stevenson  
[https://commons.wikimedia.org/wiki/File:Robert\\_Louis\\_Stevenson\\_by\\_Henry\\_Walter\\_Barnett.jpg](https://commons.wikimedia.org/wiki/File:Robert_Louis_Stevenson_by_Henry_Walter_Barnett.jpg)

Image: thinking.is.ed.ac.uk/wikidata-workshop/structured-linked-open-data/

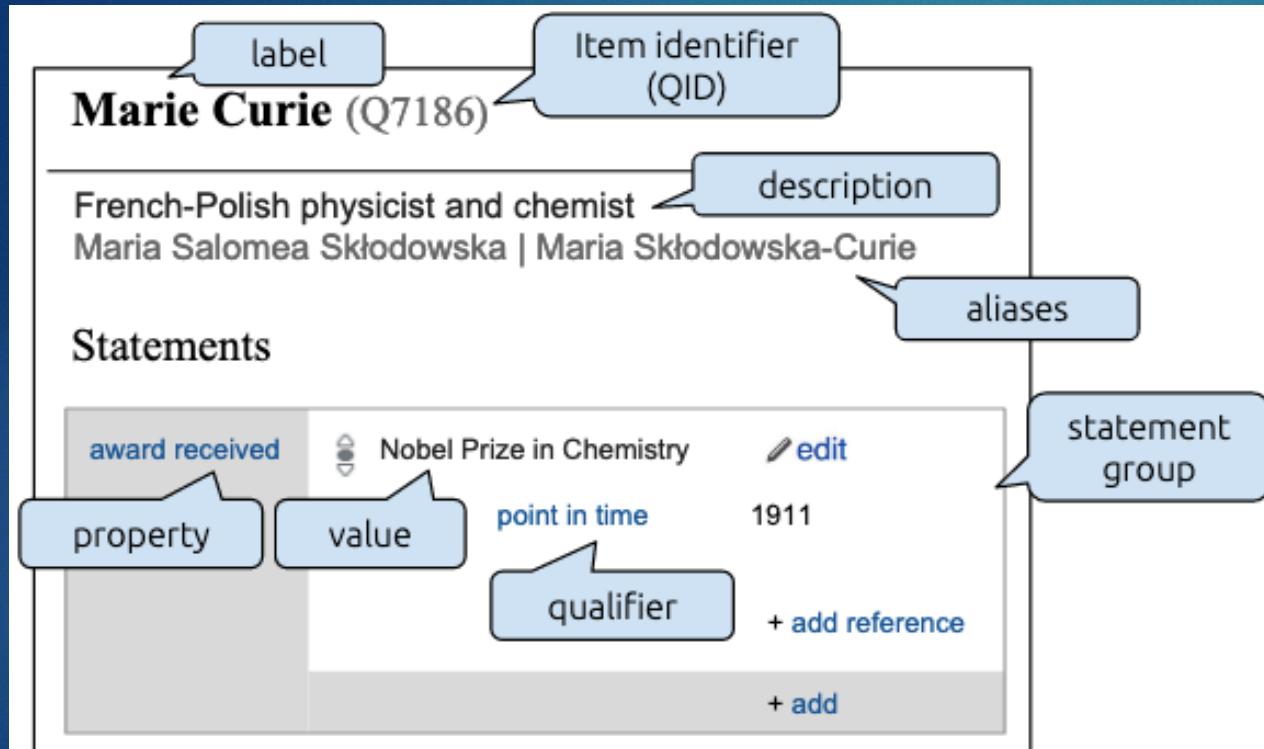


# Wikidata

A Semantic Web realized

A central storage for Wikimedia sister projects

# Wikidata anatomy and uses



[wikidata.org/wiki/WD:1](https://wikidata.org/wiki/WD:1)

- ▶ Identifiers clearing house
- ▶ A repository connecting facts about people, places, things, and concepts
- ▶ A host for data reuse in other projects

# Entity relationship



## Man from the farthest past, by C W Bishop, Charles Greeley Abbot and Aleš Hrdlicka

[Smithsonian Libraries and Archives](#)

### Object Details

#### Author

Bishop, Carl Whiting

Abbot, C. G (Charles Greeley) 1872-1973

Hrdlicka, Aleš 1869-1943

1930

[https://si.edu/object/siris\\_sil\\_40341](https://si.edu/object/siris_sil_40341)

#### Author:

Bishop, Carl Whiting, 1881-1942 author

#### Title:

Man from the farthest past / by Carl Whiting Bishop ... with the collaboration of Charles Greeley Abbot ... and Aleš Hrdlicka

#### Publisher:

[New York] [Smithsonian Institution series, Incorporated] 1930

#### Description:

6 preliminary leaves, iii, 375 pages color frontispiece, illustrations (including map)  
100 plates (some color) on 65 leaves 25 cm

#### Series:

Smith. Sci. Seri. ; -- v. 7

#### Notes:

On cover: Patrons edition

One of the plates accompanied by guard sheet with descriptive letterpress

#### Bibliography Note:

Includes bibliographical references (pages 352-358)

#### Subject:

Anthropology

Prehistoric peoples

Civilization -- History

Anthropology

Civilization

Prehistoric peoples

Anthropology

Civilization -- history

History

#### Genre:

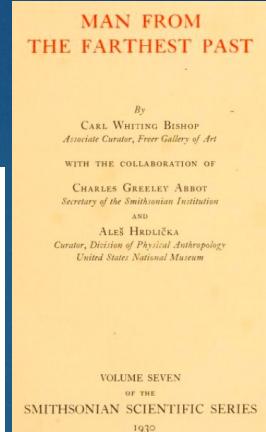
Abbot, C. G. (Charles Greeley) 1872-1973 author

#### Added Author:

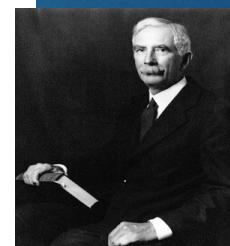
Hrdlicka, Aleš 1869-1943 author

#### Added Series:

Smithsonian scientific series ; v. 7



<http://worldcat.org/entity/work/id/1549069>



Charles Greeley Abbot

<http://viaf.org/viaf/77062086>  
<http://id.loc.gov/authorities/names/n50039868>

author [of]  
<http://id.loc.gov/vocabulary/elators/aut>

# Name authority data

**LC control no.:** n 50039868

**LCCN Permalink:** <https://lccn.loc.gov/n50039868>

**Personal name heading:** Abbot, C. G. (Charles Greeley), 1872-1973

**Variant(s):** Abbot, Charles Greeley, 1872-1973

**Special note:** Includes the old catalog headings: Abbot, Charles Greeley, 1872- ; Abbot, Charles Greeley.

**Found in:** The 1900 solar eclipse exped. of Astrophys. observ. of Smithson. Inst.

LCCN 04-33116: Smithsonian Astrophysical Observatory. The 1900 solar eclipse expedition  
... 1904 (hdg.: Abbot, Charles Greeley; usage: C.G. Abbot)

LC data base, 7-20-87 (hdg.: Abbot, Charles Greeley, 1872- ; usage: C.G. Abbot)

LCCN 29-1821: Abbot, C.G. The sun, 1929: (hdg.: Abbot, Charles Greeley, 1872- ; usage:  
Charles G. Abbot)

NUCMC data from Smithsonian Inst. Archives for Smithsonian Institution oral history project,  
1974-1985 (Charles G. Abbot, 1872-1973; Smithsonian Institution secretary)

National Academy of Sciences, Biographical memoirs, WWW site, June 24, 2008: (b. May  
31, 1872; d. Dec. 17, 1973)

# Name entity in RDF

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<rdf:RDF>
  <madsrdf:PersonalName rdf:about="http://id.loc.gov/authorities/names/n50039868">
    <rdf:type rdf:resource="http://www.loc.gov/mads/rdf/v1#Authority"/>
    <madsrdf:authoritativeLabel>Abbot, C. G. (Charles Greeley), 1872-1973</madsrdf:authoritativeLabel>
    <madsrdf:elementList rdf:parseType="Collection">
      <madsrdf:FullNameElement>
        <madsrdf:elementValue>Abbot, C. G.</madsrdf:elementValue>
      </madsrdf:FullNameElement>
      <madsrdf:FullNameElement>
        <madsrdf:elementValue>(Charles Greeley)</madsrdf:elementValue>
      </madsrdf:FullNameElement>
      <madsrdf:DateNameElement>
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      </madsrdf:DateNameElement>
    </madsrdf:elementList>
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      <madsrdf:PersonalName>
        <rdf:type rdf:resource="http://www.loc.gov/mads/rdf/v1#Variant"/>
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      </madsrdf:elementList>
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    <madsrdf:hasCloseExternalAuthority>
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    </madsrdf:hasCloseExternalAuthority>
    <madsrdf:isMemberOfMADSCollection rdf:resource="http://id.loc.gov/authorities/names/collection_NamesAuthorizedHeadings"/>
    <madsrdf:isMemberOfMADSCollection rdf:resource="http://id.loc.gov/authorities/names/collection_LCNAF"/>
    <madsrdf:hasExactExternalAuthority rdf:resource="http://viaf.org/viaf/sourceID/LC%7Cn++50039868#skos:Concept"/>
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    <madsrdf:hasCloseExternalAuthority rdf:resource="http://www.wikidata.org/entity/Q210126"/>
    <madsrdf:identifiesRWO>
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      </madsrdf:RWO>
    </madsrdf:identifiesRWO>
  </madsrdf:PersonalName>
</rdf:RDF>
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<http://id.loc.gov/authorities/names/n50039868>

# Name entity in Wikidata

**Charles Greeley Abbot** (Q210126)

American astrophysicist and the 5th Secretary of the Smithsonian  
C. G. (Charles Greeley) Abbot | C. G. Abbot

Enter a schema to check **Check**  Automatically check schema

► Recoin: Most relevant properties which are absent

▼ In more languages

Language	Label	Description	Also known as
English	Charles Greeley Abbot	American astrophysicist and the 5th Secretary of the Smithsonian	C. G. (Charles Greeley) A... C. G. Abbot
Spanish	Charles Greeley Abbot	No description defined	

All entered languages

**Statements**

instance of **human** **edit**

► 2 references

+ add value

notable work **Man from the farthest past** **edit**

► 0 references + add reference

Great inventions

► 0 references + add reference

archives at **Smithsonian Institution Archives** **edit**

► 1 reference + add value

position held **Secretary of the Smithsonian** **edit**

start time 1928  
end time 1944  
series ordinal 5

► 1 reference + add value

<http://wikidata.org/entity/Q210126>

# Work and person in Wikidata

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## Man from the farthest past (Q51421898)

[New York, Smithsonian Institution series, inc.] 1930. | Patrons edition. Smithsonian Libraries

[View Book](#)

### Other properties

<b>title</b>	Man from the farthest past <a href="#">[en]</a>
<b>part of the series</b>	<b>Smithsonian Scientific Series</b> a twelve volume collection set on the history and activities of the Smithsonian Institution (1929-1949) series ordinal : 7
<b>instance of</b>	<b>publication</b> content made available to the general public
<b>author</b>	<b>Charles Greeley Abbot</b> American astrophysicist and the 5th Secretary of the Smithsonian stated as : Abbot, C. G. (Charles Greeley), 1872-1973  <b>Aleš Hrdlička</b> Czech-American anthropologist stated as : Hrdlicka, Ales, 1869-1943  <b>Carl Whiting Bishop</b> American archeologist stated as : Bishop, Carl Whiting, 1881-1942
<b>publication date</b>	1930
<b>full work available at URL</b>	<a href="https://library.si.edu/digital-library/book/manfromfarthestp07bish">https://library.si.edu/digital-library/book/manfromfarthestp07bish</a>

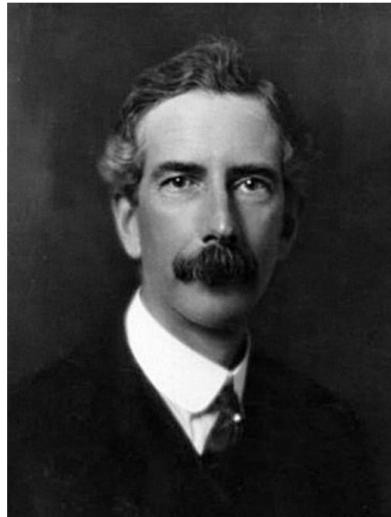
## Charles Greeley Abbot

Q210126

American astrophysicist and the 5th Secretary of the Smithsonian

[https://en.wikipedia.org/wiki/Charles\\_Greeley\\_Abbot](https://en.wikipedia.org/wiki/Charles_Greeley_Abbot):

**Charles Greeley Abbot** (May 31, 1872 – December 17, 1973) was an American astrophysicist and the fifth secretary of the Smithsonian Institution, serving from 1928 until 1944. Abbot went from being director of the Smithsonian Astrophysical Observatory, to becoming Assistant Secretary, and then Secretary of the Smithsonian Institution over the course of his career. As an astrophysicist, he researched the solar constant, research that led him to invent the solar cooker, solar boiler, solar still, and other patented solar energy inventions.



[1/2]

instance of human

given name Charles  
series ordinal 1

family name Abbott

name in native language Charles Greeley Abbot [English]

sex or gender male

country of citizenship United States of America

residence Washington, D.C.

date of birth May 31, 1872

place of birth Wilton

date of death December 17, 1973

## References

American National Biography ID	1302322
BAnQ author ID	ncf10783586
BHL creator ID	12901 named as Abbot, C. G. (C. G. Abbot)
204481	
Bibliothèque nationale de France ID	112334332
Biographical Encyclopedia of Astronomers ID	4

# Wikidata basic Item – property - value

Q numbers – item

P numbers – property

- Can be created by anyone
- Can correspond to an object or concept
- Examples:
  - Q1 – universe
  - Q2 – earth
  - Q5 – human
  - Q7377 – mammal



# Tools and APIs

# Wikidata tools

- ▶ Mix'n'Match
- ▶ Cradle
- ▶ Scholia (& Authordisambiguator)
- ▶ Listeria
- ▶ TABernacle
- ▶ InteGraality
- ▶ QuickStatements
- OpenRefine
- Wikipedia/Wikidata Google spreadsheet (browser add-on)
- Entity explosion (browser add-on)
- User widgets

<http://wikidata.org/wiki/Wikidata:Tools>

# Wikidata “Mix-n-Match”

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https://mix-n-match.toolforge.org/#/catalog/4640

Mix'n'match English Welcome, ShiehJ Search

## Smithsonian Art & Artist Files Collection (AAPG)

Names of artists that have artist files at the Smithsonian American Art and Portrait Gallery Library

Imported by user Aceven | Refresh

### Entries

Category	Count	Percentage
Fully matched	8554	17.7%
Preliminarily matched	24428	50%
No Wikidata	0	0%
Not applicable to Wikidata	0	0%
Unmatched	15319	31.7%
Total	48301	

Fully matched  
Preliminarily matched  
Unmatched  
Multiple match  
No Wikidata  
Not applicable  
Import or update  
Site stats  
[Download](#)  
[Match mode](#)  
Recent Changes  
Aliases  
Jobs  
Search only in  
[Names in other databases](#)  
Issues in this catalog  
[Mobile matching](#)  
[Visual tool](#)  
[Catalog report](#)

http://mix-n-match.toolforge.org/#/catalog/4640

This tool can list entries of some external databases, and allows users to match them against Wikidata items. Think 'red link lists on steroids'. See [the manual](#) or [watch a video](#) for a how-to. For an alternative, see [OpenRefine](#). You can [suggest](#), [import](#), or [scrape](#) new catalogs. See also: [AC properties without Mix'n'match](#).

### Catalog groups

Group	Catalogs
	8
Cinema	49
Genealogy	12
Music	11
Software	15
Wolfram Language entity	85
Archives	28
Art	126
Authority control	6

### Search catalogs

Start typing here

### Latest catalogs

- [AllGame genres](#) video games genres in the AllGame database
- [AllGame platforms](#) video game platforms in the AllGame database
- [gamegear.jp](#) video games in the gamegear.jp database
- [IRIS SSSUP authors](#) identifier for an author in IRIS SSSUP, the open-repository of Sant'Anna School of Advanced Studies
- [IRIS Unipi authors](#) identifier for an author in ARPI, the open-repository of the University of Parma
- [Frick Art Reference Library Sitters File \(Married Name Clean-Up Project\)](#)
- [Smithsonian Art & Artist Files Collection \(AAPG\)](#) Names of artists that have artist files at the Smithsonian American Art and Portrait Gallery Library
- [Nintendo64EVER](#) video games in the Nintendo64EVER database database of Nintendo 64
- [N64-database](#) video games in the N64-database database of Nintendo 64 video games
- [SBN authors](#) identifier issued by National Library Service (SBN) of Italy

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# Wikidata “Cradle”

Tool to create new  
Wikidata items from a form

<http://cradle.toolforge.org/#/subject/artist>

https://cradle.toolforge.org/#/subject/artist\_(in\_library\_collection,\_short\_description)

artist (in library collection, short description)

Labels*	Language Text	+
Aliases	Language Text	+
Descriptions	Language Text	+
instance of *	human	+
image	commonsMedia	+
sex or gender	female	+
country of citizenship	<input type="text"/>	+
name in native language	lan  monolingualtext	+
date of birth	time	+
date of death	time	+
occupation	visual artist	+
movement	<input type="text"/>	+

# Wikidata “Scholia”

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SCHOLIA Author Work ▾ Organization ▾ Location ▾ Event ▾ Project ▾ Award Topic ▾ Tools ▾ Help ▾ Search...

author

## Dolores Piperno (Q5289551)

Dolores Piperno is an American archaeologist specializing in archaeobotany. She is a senior scientist emeritus of the Smithsonian Tropical Research Institute in Balboa, Panama and the Smithsonian National Museum of Natural History, Washington. ([Read more on English Wikipedia](#))

<https://orcid.org/0000-0002-0584-3133>

### Table of Contents

- [List of publications](#)
  - [Number of publications per year](#)
  - [Number of pages per year](#)
- [Topics](#)
  - [Topic scores](#)
  - [Topics of authored works](#)
  - [Topics-works matrix](#)
- [Venue statistics](#)
- [Review statistics](#)
- [Co-author graph](#)
- [Co-author map](#)
- [Other locations](#)
- [Timeline](#)
- [Academic tree](#)
- [Citation statistics](#)
  - [Most cited works](#)
  - [Citations by year](#)
  - [Citing authors](#)
- [Associated images](#)
- [Events](#)

<http://scholia.toolforge.org/author/Q5289551>



# Dolores Piperno

Senior Scientist Emerita

<http://naturalhistory.si.edu/staff/dolores-piperno>



### Department / Division

[Anthropology](#)

### Research Interests

The archaeobotany, archaeology, and human ecology of the lowland American tropics together with the biogeographical and climatological history of the tropical biome. A main focus of my career is the origins of agriculture through investigations of phytoliths, starch

# Wikidata “Listeria”

Tool to generate wiki tables from SPARQL queries and keep data synchronized with Wikidata repository

<http://wikidata.org/wiki/WD:Listeria>

Generating List: Chinese emperors								
name	image	description	date of birth	date of death	occupation	country of citizenship	item	
Zhuanyu		Emperor of China	No/unknown value -26th century	No/unknown value -25th century				<a href="#">Q198180</a>
Daughter of Emperor Xiaoming of Northern Wei		Northern Wei empress	0528-02-12	No/unknown value	politician			<a href="#">Q10889741</a>
Emperor Ping of Han		emperor of the Han Dynasty	-0009	0006-02-03	monarch	Western Han		<a href="#">Q7244</a>
Wang Mang		Han dynasty official and founding Emperor of the Xin Dynasty (c.45 BC-23 AD)	-0045	0023-10-06	sovereign	Han dynasty Xin dynasty		<a href="#">Q7250</a>

# Wikidata “TABernacle”

Tool for browsing and editing Wikidata, a sister project of Wikipedia, that aids users in data entry and data remixing

<http://wikidata.org/wiki/Wikidata:TABernacle>

#	Item	instance of	Label	Description	Alias(es)
1	Emperor Zhi Q1207922	human	en Emperor Zhi	en	en *en
2	King Yi of Zhou Q1208109	human	en King Yi of Zhou	en King of China	en
3	King Yi of Zhou Q1208124	human	en King Yi of Zhou	en King of Zhou Dynasty	en
4	Fuchai Q1269349	human	en Fuchai	en Chinese king	en King Fuchai of Wu en Fucha
5	Fu Liang Q1270073	human	en Fu Liang	en Chinese official (374-426)	en
6	Liang Shidu Q1272181	human	en Liang Shidu	en Chinese general	en
7	Emperor Taizu of Later Liang Q1275305	human ► References/qualifiers	en Emperor Taizu of Later Liang	en Liang Dynasty emperor	en Zhu Huang en Zhu Quanzhong
8	King Zhao of Zhou Q1275781	human ► References/qualifiers	en King Zhao of Zhou	en King of the Chinese Zhou Dynasty	en Zhou Zhaowang
9	Emperor Xuan of Western Liang Q1285740	human ► References/qualifiers	en Emperor Xuan of Western Liang	en Western Liang emperor	en Xiao Qie en Xiao Cha en Lisun en Zhong Zong en Xuan Di en Xiao Cha(Liangxuanhuangdi)

<https://tinyurl.com/slaChineseEmperors>

# Wikidata “InteGraality”

[Wikidata:GLAM/Smithsonian Institution/Reports/SAAM/tabs](#) This table describes the completeness of properties in Wikidata for SAAM objects. A good reference for item structure for visual works: [Wikidata:WikiProject\\_Visual\\_arts/Item\\_structure](#).

[all entities](#) | [count](#) | [all groupings](#) | [without grouping property](#) | [below threshold \(1\)](#) | Grouping by [instance of \(P31\)](#)

Manually update

Top groupings (Minimum 1 items)		Top Properties (used at least 0 times per grouping)									
Name	Count	image (P18)	inception (P571)	height (P2048)	width (P2049)	creator (P170)	copyright status (P6216)	inventory number (P217)	described at URL (P973)		
painting (Q3305213)	8405	43.36% (3644)	92.31% (7759)	89.32% (7507)	89.32% (7507)	99.89% (8396)	42.42% (3565)	100.0% (8405)	0.25% (21)		
watercolor painting (Q18761202)	392	65.82% (258)	98.47% (386)	99.49% (390)	99.49% (390)	100.0% (392)	100.0% (392)	100.0% (392)	0% (0)		
print (Q11060274)	6	16.67% (1)	100.0% (6)	50.0% (3)	50.0% (3)	100.0% (6)	0% (0)	100.0% (6)	0% (0)		
sculpture (Q860861)	4	100.0% (4)	100.0% (4)	50.0% (2)	25.0% (1)	100.0% (4)	0% (0)	75.0% (3)	0% (0)		

[wikidata.org/wiki/Wikidata:GLAM/Smithsonian\\_Institution/Reports/SAAM/Object\\_ID\\_completeness](https://wikidata.org/wiki/Wikidata:GLAM/Smithsonian_Institution/Reports/SAAM/Object_ID_completeness)

# Wikidata “QuickStatements”

Tool to edit Wikidata items,  
based on a simple set of text  
commands, V1 or CSV.

<http://quickstatements.toolforge.org/#/>

This is a new interface for QuickStatements V2. Just in case, the old interface is [here](#).

Create new command batch for **Wikidata** as batch name

```

CREATE
LAST Len "Alfred Leslie"
LAST Den "American artist known for figurative artworks"
LAST P31 Q5
LAST P21 Q6581097
LAST P569 +1927-10-29T00:00:00Z/11 S854 "http://www.artnet.com/artists/alfred-leslie/" S813
+2020-09-01T00:00:00Z/11
LAST P19 Q18426
LAST P20 Q7565985
LAST P6379 Q1192305
LAST P1795 "2894"
CREATE
LAST Len "Allan Janus"

```

Create new command batch for **SI Wikibase** as batch name

```

qid,Len,Den,P17,P208,P65,P135
,"Louis Pasteur","French chemist and microbiologist","","Q529","",Q18,Q138,Q71
,"Nicolaus Copernicus","Renaissance-era mathematician, astronomer, and clergyman who formulated the heliocentric model of the Universe","","Q529","",Q18,Q138,Q71
,"André-Marie Ampère","French physicist and mathematician","","Q529","",Q18,Q138,Q71
,"Alessandro Volta","Italian physicist, chemist, and pioneer of electricity and power","","Q529","",Q18,Q138,Q71
,"Aristotle","ancient Greek philosopher","","Q529","",Q18,Q138,Q71
,"Isaac Newton","British physicist and mathematician","","Q529","",Q18,Q138,Q71

```

# OpenRefine

<http://openrefine.org>

All	chemical elem
1.	hydrogen Choose new match
2.	helium Choose new match
3.	lithium Choose new match
4.	beryllium Choose new match
5.	boron Choose new match
6.	carbon Choose new match
7.	nitrogen Choose new match
8.	oxygen Choose new match
9.	fluorine Choose new match
10.	neon Choose new match
11.	sodium Choose new match
12.	magnesium Choose new match
13.	aluminum Choose new match
14.	silicon Choose new match
15.	francium Choose new match
16.	phosphorus Choose new match
17.	iron Choose new match
18.	sulfur Choose new match
19.	chlorine Choose new match
20.	argon Choose new match
21.	potassium Choose new match
22.	calcium Choose new match
23.	lead Choose new match

<https://www.wikidata.org/wiki/Wikidata:Tools/OpenRefine>

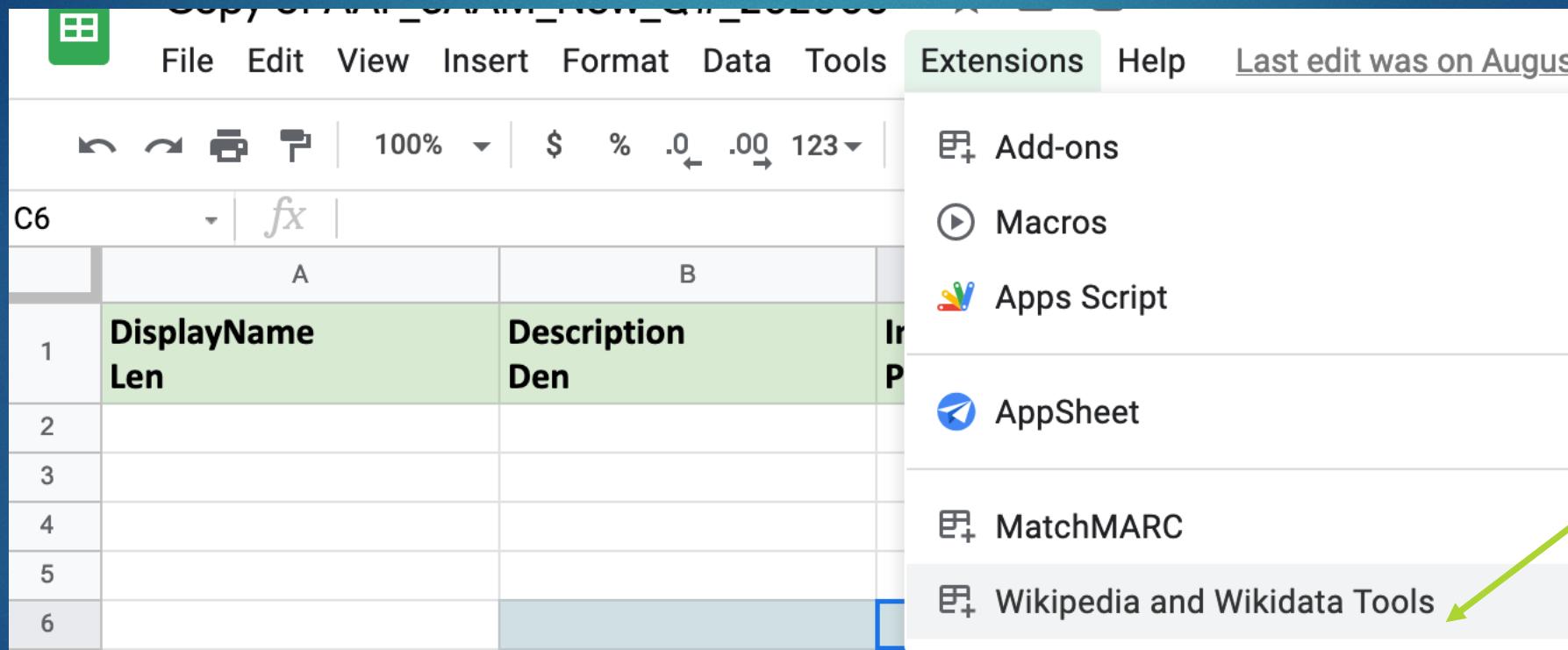
# Schemas (via Shape Expression)

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<https://youtube.com/embed/Bbf6lOXKirQ>

[https://www.wikidata.org/wiki/Wikidata:WikiProject\\_Schemas](https://www.wikidata.org/wiki/Wikidata:WikiProject_Schemas)  
<http://shex.io/>

# Browser extension: Wikipedia/Wikidata



The screenshot shows a spreadsheet application interface with a menu bar (File, Edit, View, Insert, Format, Data, Tools) and a toolbar above a grid. The grid has columns A and B, and rows 1 through 6. Row 1 contains headers: 'DisplayName' in column A and 'Description' in column B. A green arrow points from the bottom right towards the 'Wikipedia and Wikidata Tools' option in the Extensions menu.

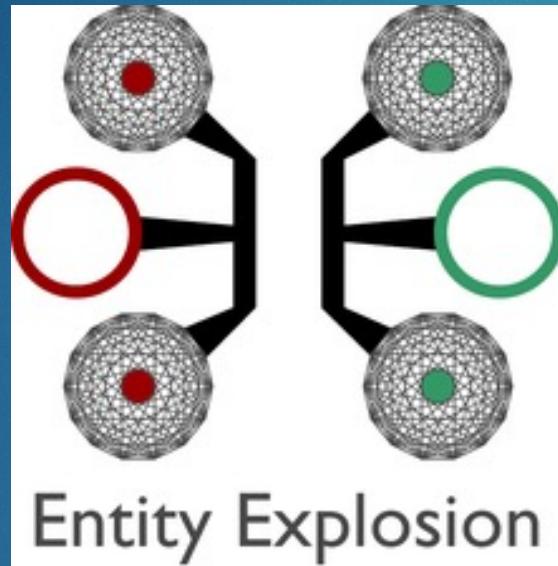
	A	B
1	DisplayName Len	Description Den
2		
3		
4		
5		
6		

Extensions   Help   Last edit was on August 20, 2023

- Add-ons
- Macros
- Apps Script
- AppSheet
- MatchMARC
- Wikipedia and Wikidata Tools**

# Browser extension: Entity Explosion

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https://open.spotify.com/artist/0Sadg1vgvaPqGTOjxu0N6c

lengua  
[es] español

entidad  
Girls' Generation (Q20153)

Popular

1 Gee

2 Lion H

3 Into the New Year

4 Mr. Mr.

Wikidata: [Q20153](#)  
Wikimedia Commons: [Girls' Generation](#)  
Wikipedia: [Girls' Generation](#)

categoría de miembros: [Categoría:Miembros de Girls' Generation](#)  
categoría principal del tema: [Categoría:Girls' Generation](#)  
compuesto por: [Taeyeon](#)  
compuesto por: [Sooyoung](#)  
compuesto por: [Sunny](#)  
compuesto por: [Jessica Jung](#)  
compuesto por: [Tiffany Young](#)  
compuesto por: [Seohyun](#)  
compuesto por: [Hyoyeon](#)  
compuesto por: [Kwon Yuri](#)  
compuesto por: [Yoona](#)

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# Data reuse

## Presenting Wikidata knowledge

# Data representations

- ▶ As graphs

<https://w.wiki/4LTg>

- ▶ As maps

<https://w.wiki/42WB>

- ▶ In tabular form

<https://w.wiki/3Kem>

# Wikidata display options

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**Charles Greeley Abbot** (Q210126)

[Edit](#) [SUM](#)

[Item](#) [Discussion](#) [Star](#)

American astrophysicist and the 5th Secretary of the Smithsonian

C. G. (Charles Greeley) Abbot | C. G. Abbot

Enter a schema to check [Check](#)  Automatically check schema

Recoin: Most relevant properties which are absent

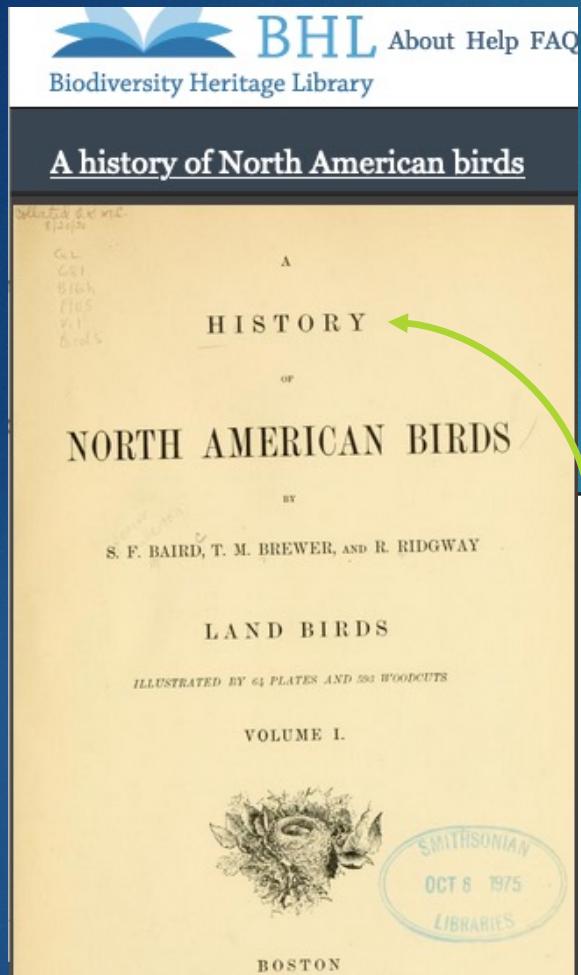
In more languages

Language	Label	Description	Also known as
English	Charles Greeley Abbot	American astrophysicist and the 5th Secretary of the Smithsonian	C. G. (Charles Greeley) A... C. G. Abbot
Spanish	Charles Greeley Abbot	No description defined	

Search Item [Start](#) [Properties](#) [Classes](#) [Rules](#) [About](#)

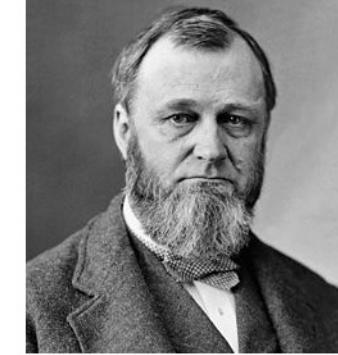
Reasonator

Statements	
Own statements	
writing language	English (West Germanic language originating in England)
place of death	Washington, D.C. (capital city of the United States)
languages spoken, written or signed	English (West Germanic language originating in England)



# Spencer Baird inter- & intra- links: author to work

educated at	Dickinson College college in Pennsylvania
family name	Baird family name
given name	Spencer unisex given name series ordinal : 1
Fullerton	given name series ordinal : 2
notable work	<a href="#">A history of North American birds</a> <a href="#">Natural History Illustrations</a> 1889 b <a href="#">The water birds of North America</a> <a href="#">Outlines of American ornithology</a> <a href="#">Report upon the invertebrate animals and physical features of the region</a> sci <a href="#">Catalogue of North American birds, chiefly in the Museum of the Smithsonian Institution Washington</a> :Smithsonian Institution,1858.   Smithsonian Libraries View Book



Spencer Fullerton Baird (Q14049)

Spencer Baird | Baird | Spencer F. Baird | Baird, SF | Спенсер Бэрд | スペンサー・フラートン・ペアード | Спенсер Фуллертон Бэрд | 斯賓塞·富勒頓·貝爾德 | سپنسر فولرتون بیرد | Spencer Fullerton Baird | ספנסר פולרטון בAIRד

American naturalist, ornithologist, ichthyologist, museum curator, and the 2nd Secretary of the Smithsonian

**Spencer Fullerton Baird** was a US-American naturalist, curator, ornithologist, zoologist, ichthyologist, and university teacher.

He was born on February 3, 1823 in Reading to Lydia McFunn Baird.

He studied at Dickinson College. His field of work included ornithology, ichthyology, and herpetology.

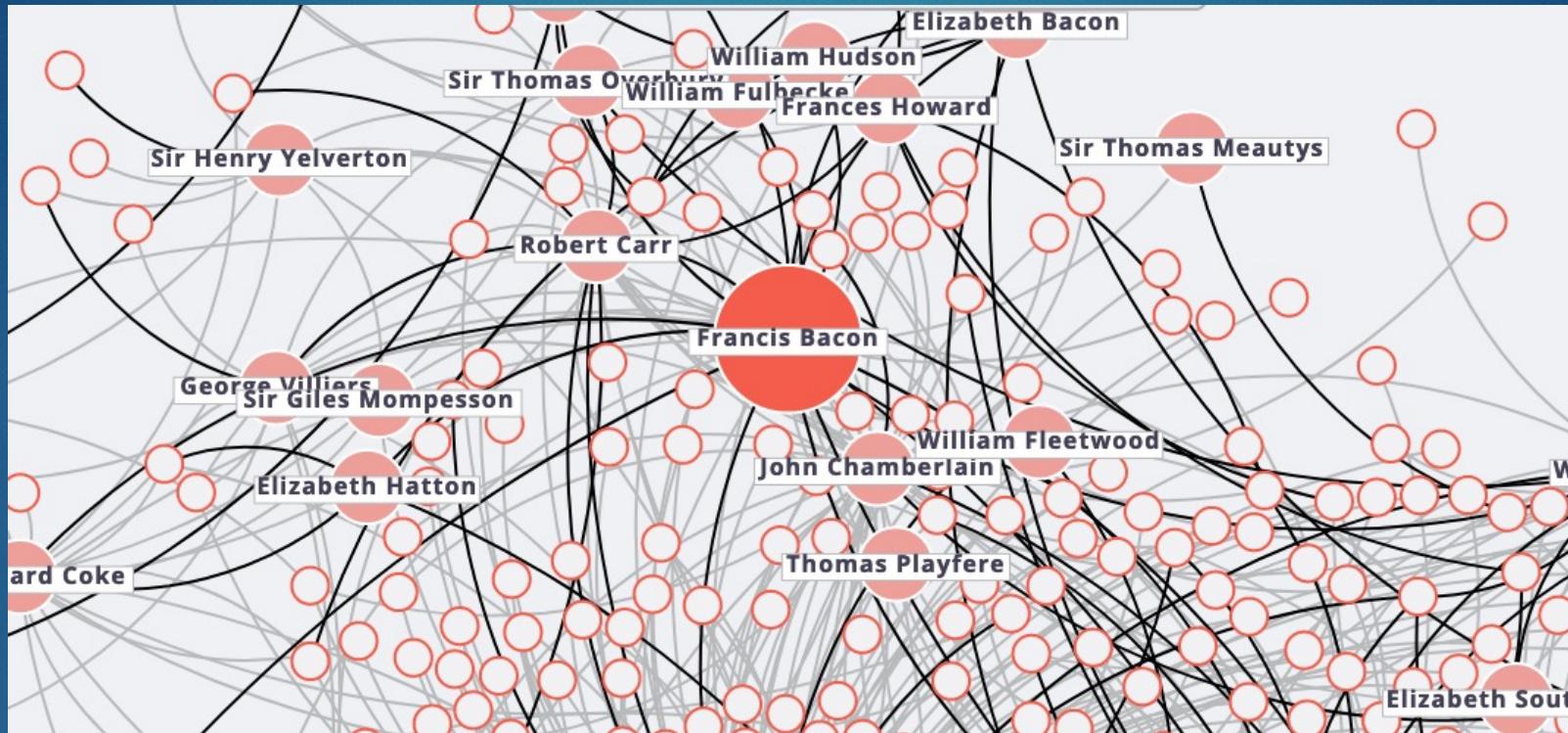
<http://reasonator.toolforge.org/?&q=51403552>

# Wikipedia article with Wikidata



<http://wikipedia.org/wiki/WP:MBABEL>

# Six Degrees of Francis Bacon



[http://sixdegreesoffrancisbacon.com/?ids=10000473&min\\_confidence=60&type=network](http://sixdegreesoffrancisbacon.com/?ids=10000473&min_confidence=60&type=network)

# Crotos

Language English Images/page 20 → Reading mode  
smithsonian Search ☽ ○ ☀ ☼

**Crotos**  
Cosmos Callisto Lab

4354 Results

Rooftops  
Alice Pike Barney - Smithsonian American Art Museum

A View of Venice  
Thomas Moran - Smithsonian American Art Museum

Edge of a Stream  
Eliphalet Frazer Andrews - Smithsonian American Art Museum

James Smithson  
Henri-Joseph Johns - National Portrait Gallery

<http://zone47.com/crotos/?s=smithsonian>

# WADE: Wiki Art Depiction Explorer

## Two Comanche Girls (Q20441431)

Label from: English (en)

[view on Wikidata](#) [skip this photo](#) [browse paintings](#)

artist: George Catlin (Q455133)

collection: Smithsonian American Art Museum (Q1192305)

location: Smithsonian American Art Museum (Q1192305)

country of origin: United States of America (Q30)

material used: oil paint (Q296955) canvas (Q4259259)

Smithsonian American Art Museum ID: 4421

### information from the Smithsonian American Art Museum catalog

**description:** The scene, painted by George Catlin at a Comanche village in 1834, shows "the wigwam of the Chief, his dogs, and his five children." The artist also described the village as "six or eight hundred skin-covered lodges, made of poles and buffalo skins, in the manner precisely as those of the Sioux and other Missouri tribes . . . This village with its thousands of wild inmates, with horses and dogs, and wild sports and domestic occupations, presents a most curious scene; and the manners and looks of the people, a rich subject for the brush and the pen." (Catlin, Letters and Notes, vol. 2, no. 42, 1841, reprint 1973, and 1848 Catalogue, Catlin's Indian Gallery, SAAM online exhibition)

**keywords** [Ethnic – Indian – Comanche](#) [Children](#) [Architecture Exterior – domestic – teepee](#)

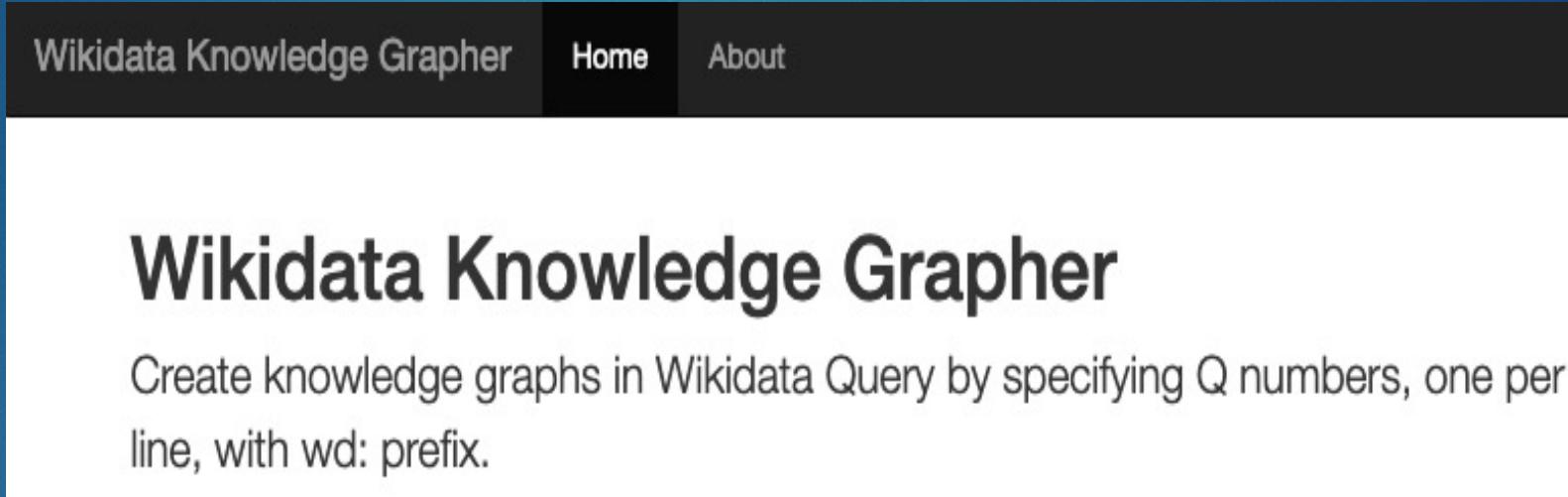
what can you see in this painting?

<http://art.wikidata.link/item/Q20441431>



[wikidata.org/wiki/Wikidata:WikiProject\\_Wiki\\_Art\\_Depiction\\_Explorer](https://wikidata.org/wiki/Wikidata:WikiProject_Wiki_Art_Depiction_Explorer)

# Data visualization



The screenshot shows a dark-themed web application interface. At the top, there is a navigation bar with three items: "Wikidata Knowledge Grapher" (highlighted in white), "Home", and "About". Below the navigation bar, the main content area has a white background. The title "Wikidata Knowledge Grapher" is displayed in a large, bold, dark font. Below the title, a descriptive text reads: "Create knowledge graphs in Wikidata Query by specifying Q numbers, one per line, with wd: prefix.".

<http://knowledgegrapher.toolforge.org>

Ex: [https://w.wiki/4U\\$O](https://w.wiki/4U$O) ; Ex: <https://w.wiki/4VFU>

# Inventaire

inv Search English ▾

All Work Author Series Publisher Collection Subject

All User Group

photo credits: Wikimedia Commons

## Dream of the Red Chamber

wd:Q8265

Dream of the Red Chamber, also called The Story of the Stone, or Hongloumeng (traditional Chinese: 紅樓夢; simplified Chinese: 红楼梦; pinyin: Hónglóumèng), composed by Cao Xueqin, is one of China's Four Great Classical Novels. It was written some time in the middle of the 18th ...

English (100%)  
Deutsch (99%)  
Français (95%)  
Svenska (95%)  
Italiano (91%)  
Bahasa Indonesia (86%)  
Español (82%)  
العربية (78%)  
Nederlands (71%)  
Dansk (69%)  
Русский (67%)  
Türkçe (65%)

<http://inventaire.io/entity/wd:Q8265>

# Histropedia

Secretaries of the Smithsonian Institution

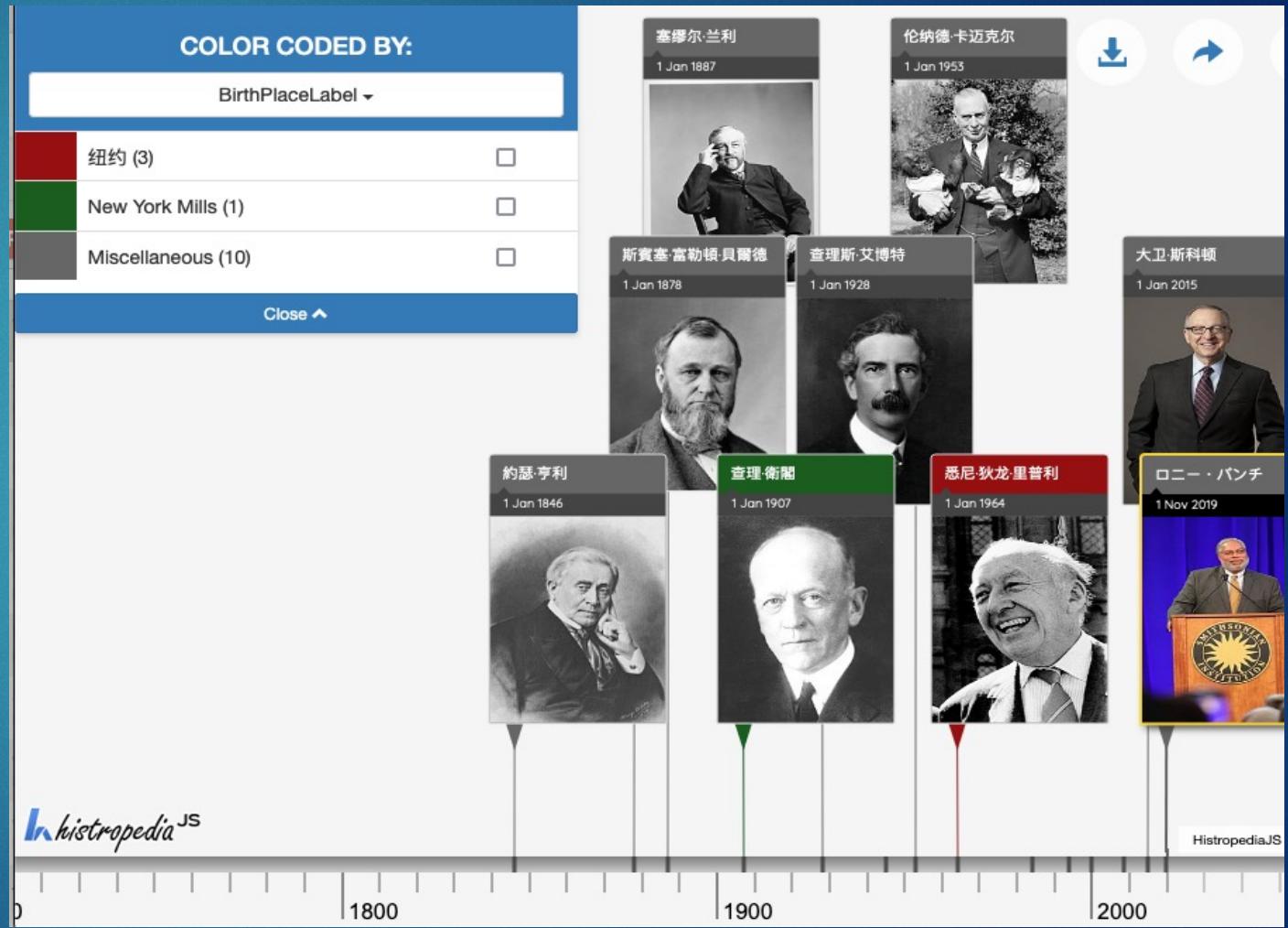
<https://w.wiki/3wmq>

Data representation via Histropedia

<http://tinyurl.com/SIsecretaries>

<http://tinyurl.com/SIsecretariesBydates>

<http://tinyurl.com/SIsecretariesLang>



# Wikidata “Dashboard”: CoVid-19

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COVIWD

COVIWD: COVID-19 WIKIDATA DASHBOARD

COVID19

The [COVID-19 pandemic](#) is an ongoing pandemic of coronavirus disease 2019 (COVID-19), caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The outbreak was first found in Wuhan, China, in December 2019, and was called a pandemic by the World Health Organization (WHO) on 11 March 2020. COVIWD (COVID-19 Wikidata Dashboard) provides a one-stop information/visualization service for COVID-19-related topics. The live data for this dashboard comes from [Wikidata](#), a free but quality, collaborative knowledge graph. The information presented here in this dashboard is not to be considered medical advice and is not intended to replace consultation with a qualified medical professional. A paper (in English) describing the data & query model and development of COVIWD is available at [this link](#). For any feedback, please feel free to contact [Fariz Darari](#).

<http://coviwd.org>

COVID19 Map



# Web services

- ▶ Library of Congress
- ▶ iNaturalist
- ▶ IMDB
- ▶ GeoName
- ▶ Spotify
- ▶ etc.
- ▶ Abbot, C.G. (Charles Greeley)  
<http://id.loc.gov/authorities/names/n50039868>
- ▶ Yellow-legged Gull  
<http://inaturalist.org/taxa/59202>
- ▶ James Norton  
<http://imdb.com/name/nm3584268>
- ▶ Tokyo Prefecture  
<http://geonames.org/1850144>
- ▶ Girls' Generation (Korean girl pop music group)  
<http://open.spotify.com/artist/0Sadg1vgvaPqGTOjxu0N6c>

# Embedded in Library catalog

- ▶ Smithsonian library BF catalog
- ▶ Cornell library New catalog
- ▶ Mich State library catalog
- ▶ U-W Madison library catalog
- ▶ C. G. Abbot  
<https://smithsonian.svde.org/agents/881654265711649>
- ▶ “Two” (scroll to click <Highlight the DISCOGS data>)  
<http://newcatalog.library.cornell.edu/catalog/8058246>
- ▶ “Comparison of ...” (scroll to click icon <i>) link for < Subjects >)  
<http://d.lib.msu.edu/etd/3746/>
- ▶ “Mark Twain” (scroll to view <Information from the Web>)  
<http://search.library.wisc.edu/catalog/9911042395202121>

Want more?

The possibility is ENDLESS...

Check out

<http://thinking.is.ed.ac.uk/wikidata-workshop/structured-linked-open-data/>

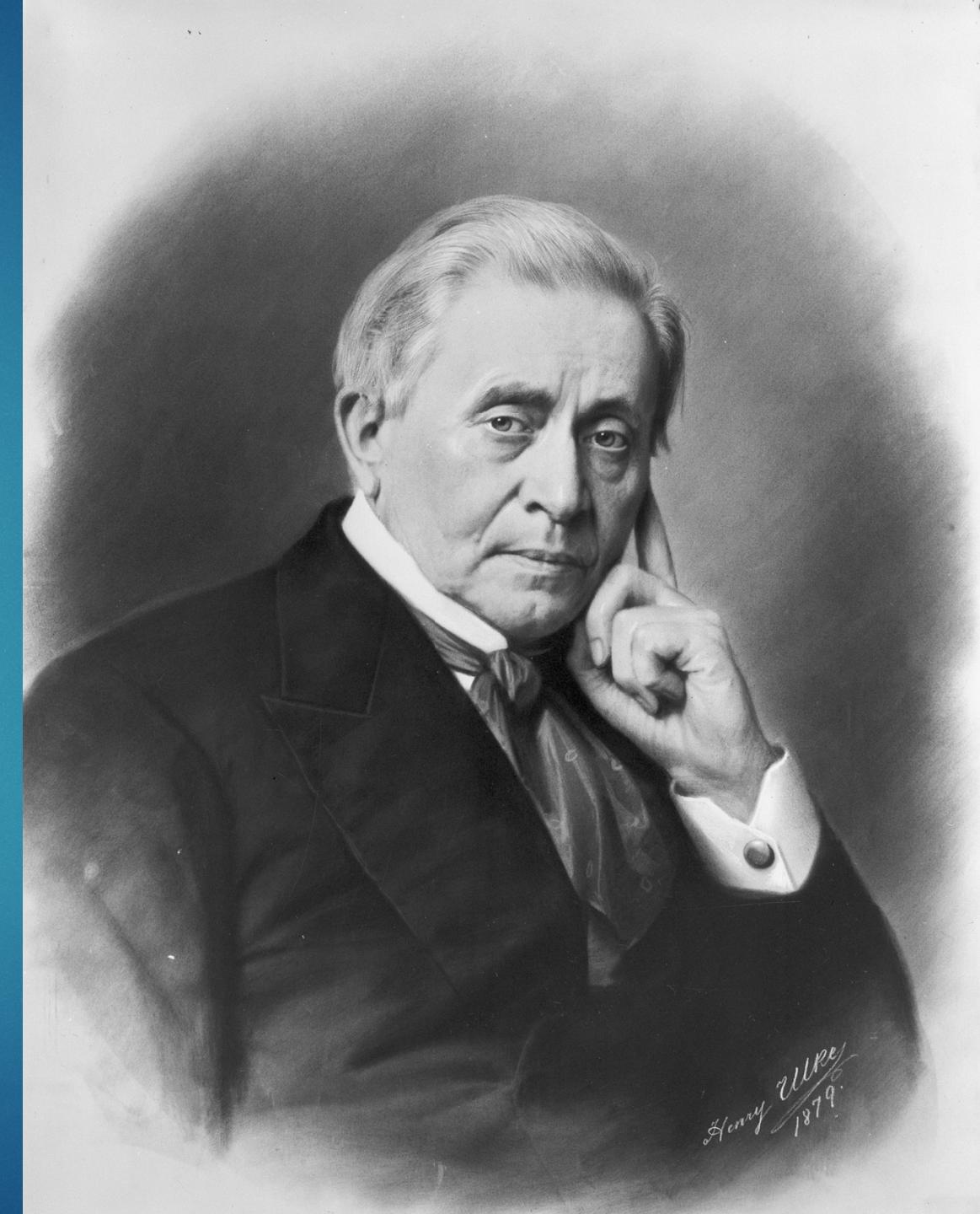
# Your answer ...

- ▶ Why should you care?
- ▶ How will linked data relate to my work?
- ▶ How will linked data help describing collections
- ▶ How will linked data apply controlled vocabularies
- ▶ What can I do with linked data NOW?
- ▶ What tools or skills are available at my fingertips?

“The worth and importance of the Institution is not to be estimated by what it accumulates within the walls of its building, but by what it **sends forth** to the world.”

—Joseph Henry, 1852

First Secretary of the Smithsonian Institution (1846-1878)



# Resources

- ▶ *Linked data implementations*
  - ▶ <http://oclc.org/content/dam/research/events/2018smith-yoshimura-Linked-data-implementations-who-what-why-SWIB18.pptx>
- ▶ *IFLA/LRM and RDA training*
  - ▶ <http://www.loc.gov/catworkshop/RDA2020/>
- ▶ *LD4PE : Exploring Linked data*
  - ▶ [http://explore.dublincore.net/competency\\_index/d2695955/s2696018/s2696061/s2742457/](http://explore.dublincore.net/competency_index/d2695955/s2696018/s2696061/s2742457/)
- ▶ *Next-generation metadata and the semantic continuum*
  - ▶ <http://hangingtogether.org/next-generation-metadata-and-the-semantic-continuum/>
- ▶ *Formulating and Obtaining URIs*
  - ▶ [http://loc.gov/aba/pcc/bibframe/TaskGroups/formulate\\_obtain\\_URI\\_guide.pdf](http://loc.gov/aba/pcc/bibframe/TaskGroups/formulate_obtain_URI_guide.pdf)
- ▶ *URI FAQs: PCC URI Task Group on URIs in MARC*
  - ▶ [https://loc.gov/aba/pcc/bibframe/TaskGroups/URI\\_FAQs.pdf](https://loc.gov/aba/pcc/bibframe/TaskGroups/URI_FAQs.pdf)

# Conferences

## ► **DublinCore**

<https://www.dublincore.org/conferences/>

## ► **LD4 Community**

<https://ld4.io>

## ► **Semantic Web in Libraries**

<https://swib.org/swib22/>



## **BIBFRAME Workshop in Europe**

<https://2022.bfwe.eu/>



<http://wikidatacon.org>



<https://openlibraryfoundation.org/about/wolfcon/>



Thank you!