



Data driven cultural heritage  
interrogations facilitated by  
knowledge base technology

*The Sloane Lab example*

Dr. Andreas Vlachidis





**'THE SLOANE LAB':  
LOOKING BACK TO BUILD SHARED COLLECTIONS**  
UNIVERSITY COLLEGE LONDON & TU DARMSTADT



**'UNPATH'D WATERS':  
MARINE AND MARITIME COLLECTIONS IN THE UK**  
HISTORIC ENGLAND



**TOWARDS  
A NATIONAL  
COLLECTION**



**UKRI** Arts and  
Humanities  
Research Council

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**DISCOVERY PROJECTS**



**'THE CONGRUENCE ENGINE':  
DIGITAL TOOLS FOR NEW COLLECTIONS-BASED  
INDUSTRIAL HISTORIES**  
SCIENCE MUSEUM GROUP



**OUR HERITAGE, OUR STORIES:  
LINKING AND SEARCHING  
COMMUNITY-GENERATED DIGITAL CONTENT TO  
DEVELOP THE PEOPLE'S NATIONAL COLLECTION**  
UNIVERSITY OF GLASGOW



**TRANSFORMING COLLECTIONS:  
REIMAGINING ART, IDENTITY AND NATION**  
UNIVERSITY OF ARTS LONDON



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# Sloane's Collections



**Hans Sloane** (1660–1753), British physician, naturalist and collector

Collected **70,000+ objects**, now scattered among multiple institutions

One of the founding collections of the **British Museum, Natural History Museum** and **British Library**

<http://sloanelab.org>

The origins of the collection connect to the Transatlantic Slave Trade and African enslavement



# Knowledge Base

A technology to store, interconnect and retrieve information

- Structured and Unstructured information
- A Repository
- A Management System

Digital / Computer Systems – Process and Analysis

- Expert Systems
- Decision Support Systems
- Artificial Intelligence System



## Preservation of Information

Degradation - Organisation  
Manuscripts, Artifacts, Artwork



## Accessibility and Dissemination

Global Audience  
Public Engagement and Education



## Interoperability and Integration

Standardised Formats  
Ontologies



## Enhanced Research Capabilities

Multidisciplinary Research  
Multimodality, Cultural Identity - Continuity

*'Collections as data entails thinking about ways to increase meaning making capacity by making collections more amenable to use across an expanded set of methods and tools, typically but not exclusively computational in nature'*  
(Padilla, 2017, 2).

- Augmenting stakeholder's understanding
- Complex and cross-institutional data environments
- Instrument for data collection, inventory and exploration

# The Sloane Lab Knowledge Base



# Overarching Goals

1

**Aggregate**  
multiple records  
from different  
sources

2

Develop a  
common **data  
model** for all  
records

3

**Integrate** the  
records into a  
single  
**knowledge base**

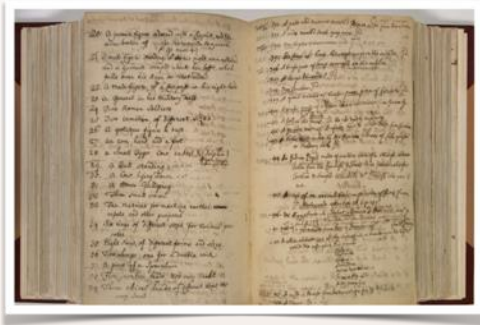
4

Ensure  
**interoperability**  
with existing  
standards

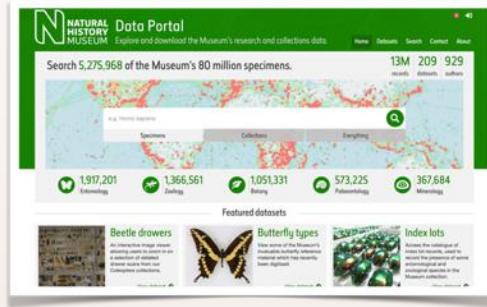
5

Enable  
**multivocality**

# Sloane Lab Knowledge Base



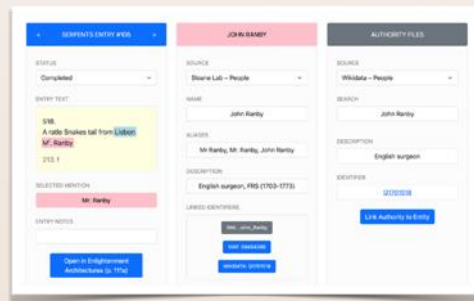
Historical Catalogues



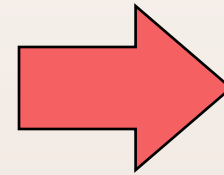
Contemporary Records



External Sources



Newly Annotated Data



Sloane Lab Knowledge Base

**BM Object A\_SLMisc-184**  
URL: [https://sloanelab.org/E131/m\\_data/A\\_SLMisc-184](https://sloanelab.org/E131/m_data/A_SLMisc-184)  
Type: *E131\_Physical\_Object*

**Description**  
BM Object A\_SLMisc-184  
Object Type  
cup

**Related People**  
Mr. Pinfold

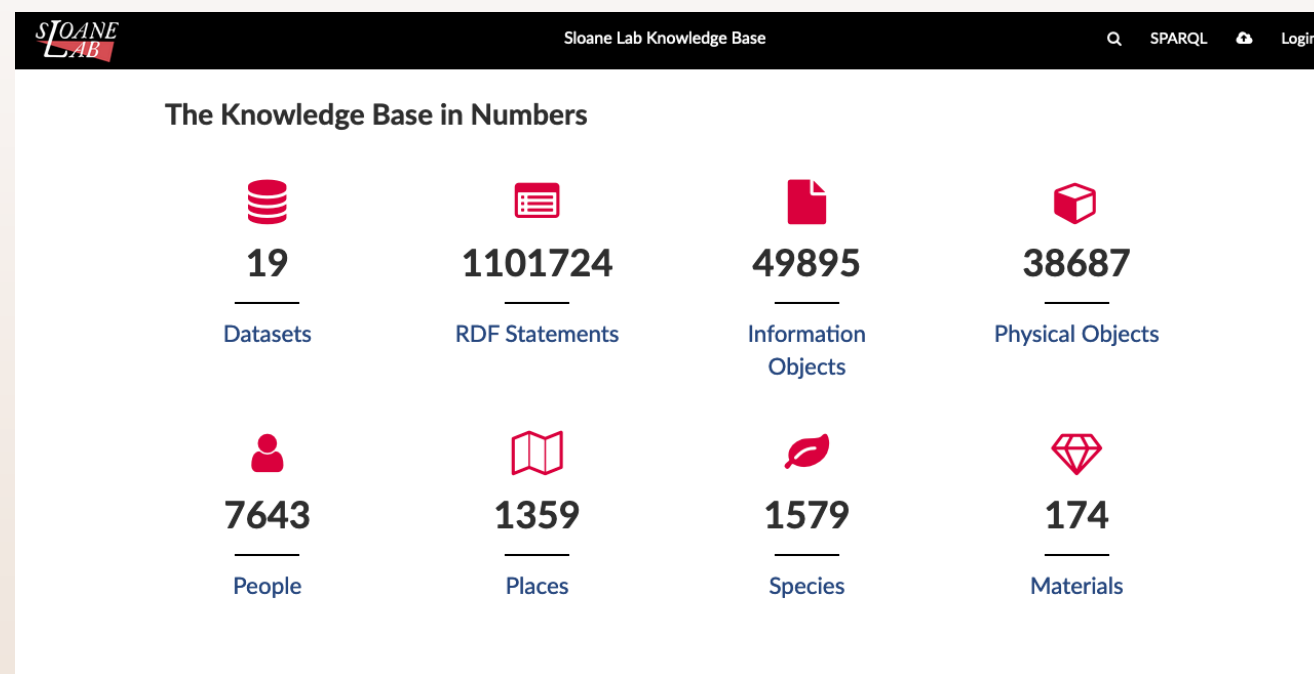
**Historical Description**  
Cup, surrounded with an openwork lattice of flowers. Made of soapstone or steatite.

**Related Places**

**Held by**  
British Museum  
**Dataset**  
BM Dataset  
**Record**  
BM Record A\_SLMisc-184

## A rich environment for data discovery and query

- Keyword Search
- Structured Search
- Constant Search
- Linked Data View
- Graph View
- SPARQL endpoint
- Statements View



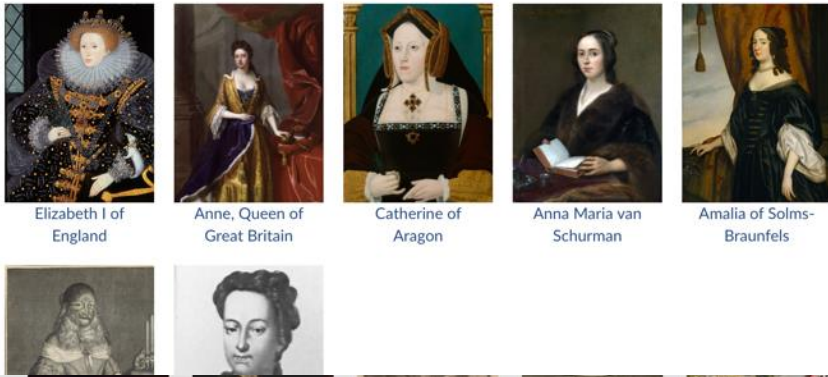


# Visualisations

## People of the Sloane Collections

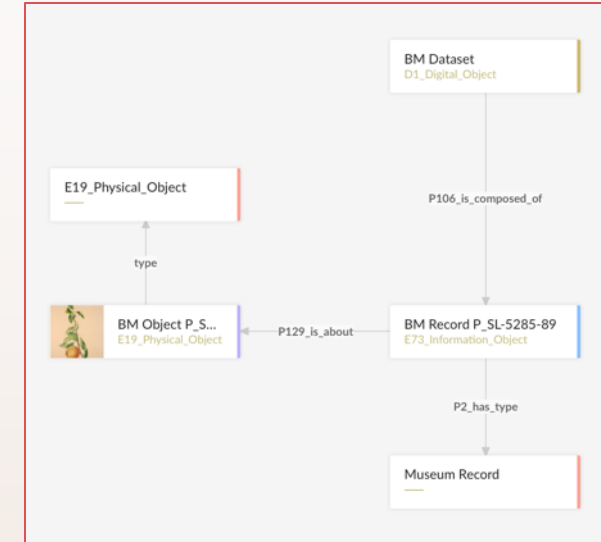
Most Mentioned People | Women | Enslaved People | Historical Catalogue Statistics

Contemporary Catalogue Statistics



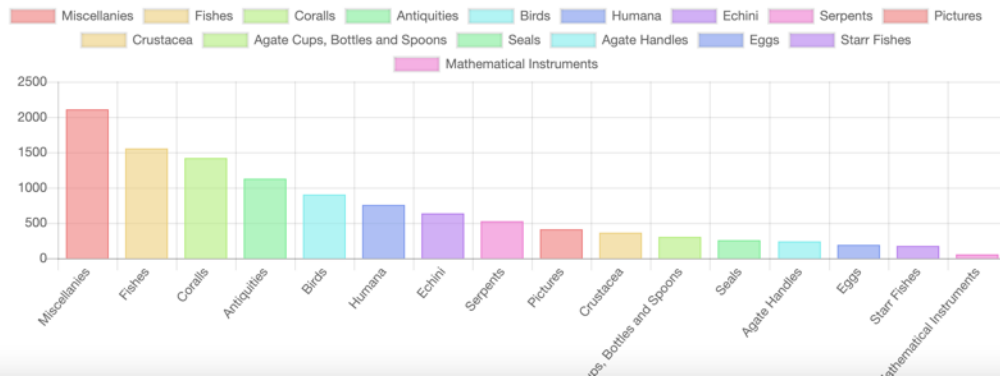
## Places in the Sloane Collections

Map | Places | Statistics



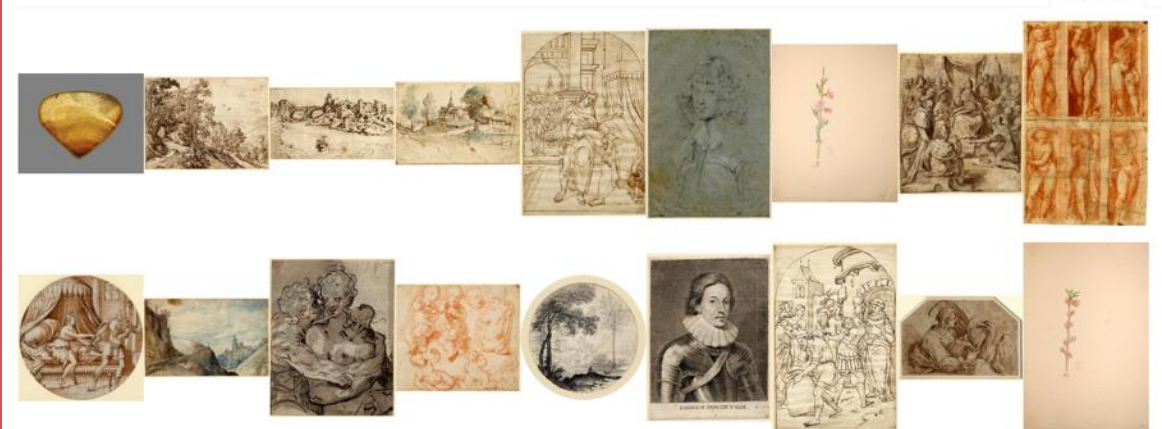
## Datasets in the Knowledge Base

Historical Catalogues | Contemporary Records



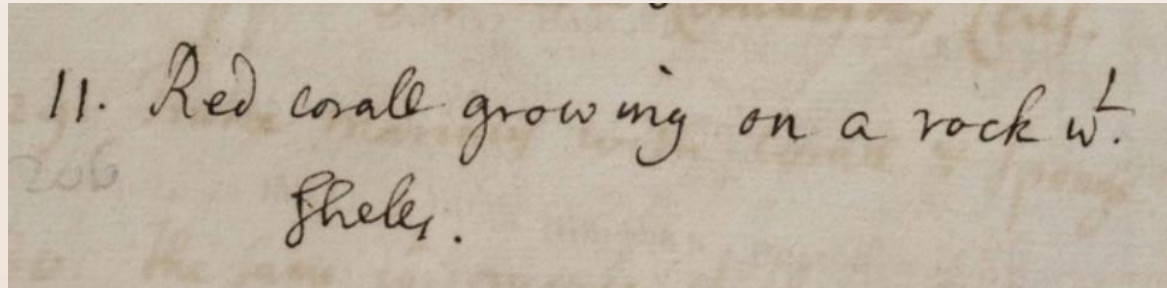
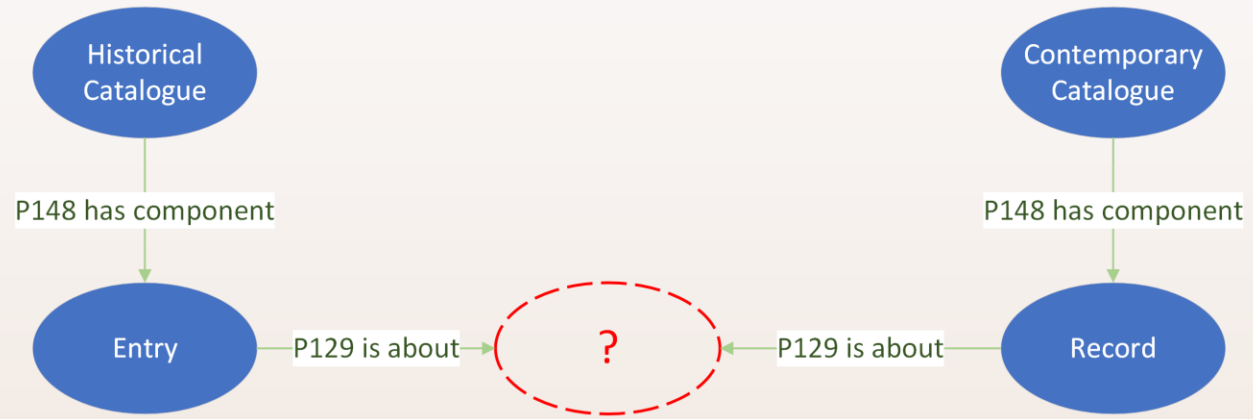
## Objects in the Knowledge Base

From BM | From NHM

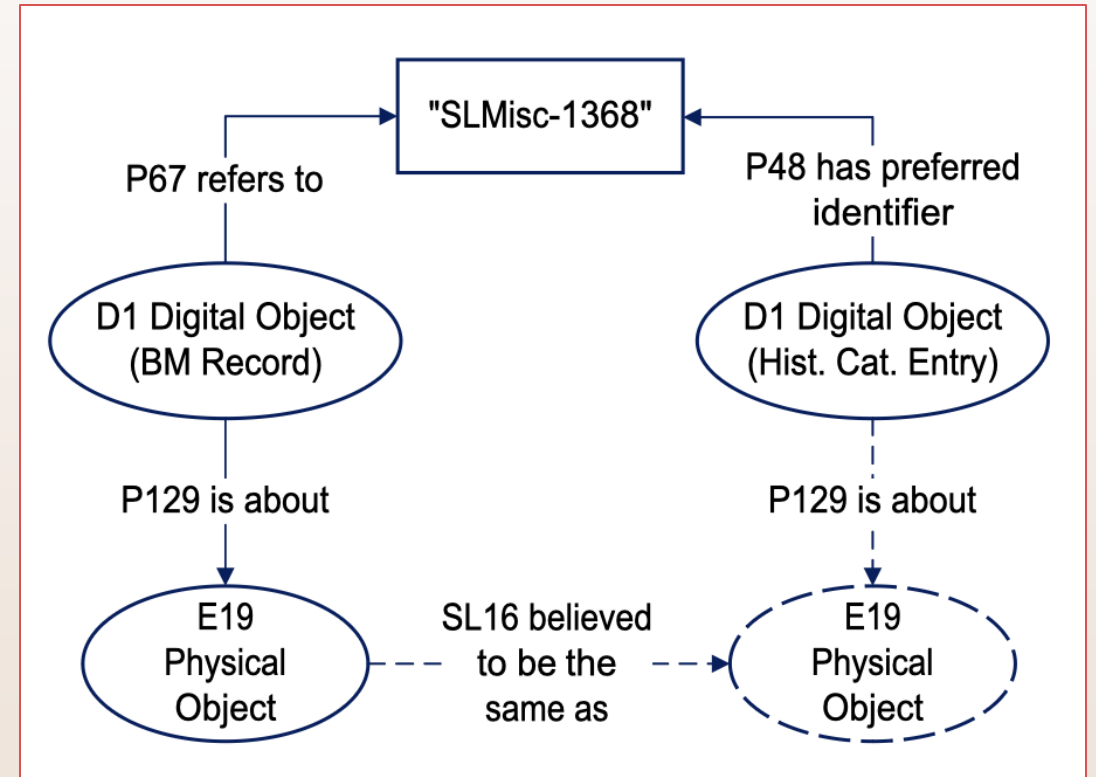
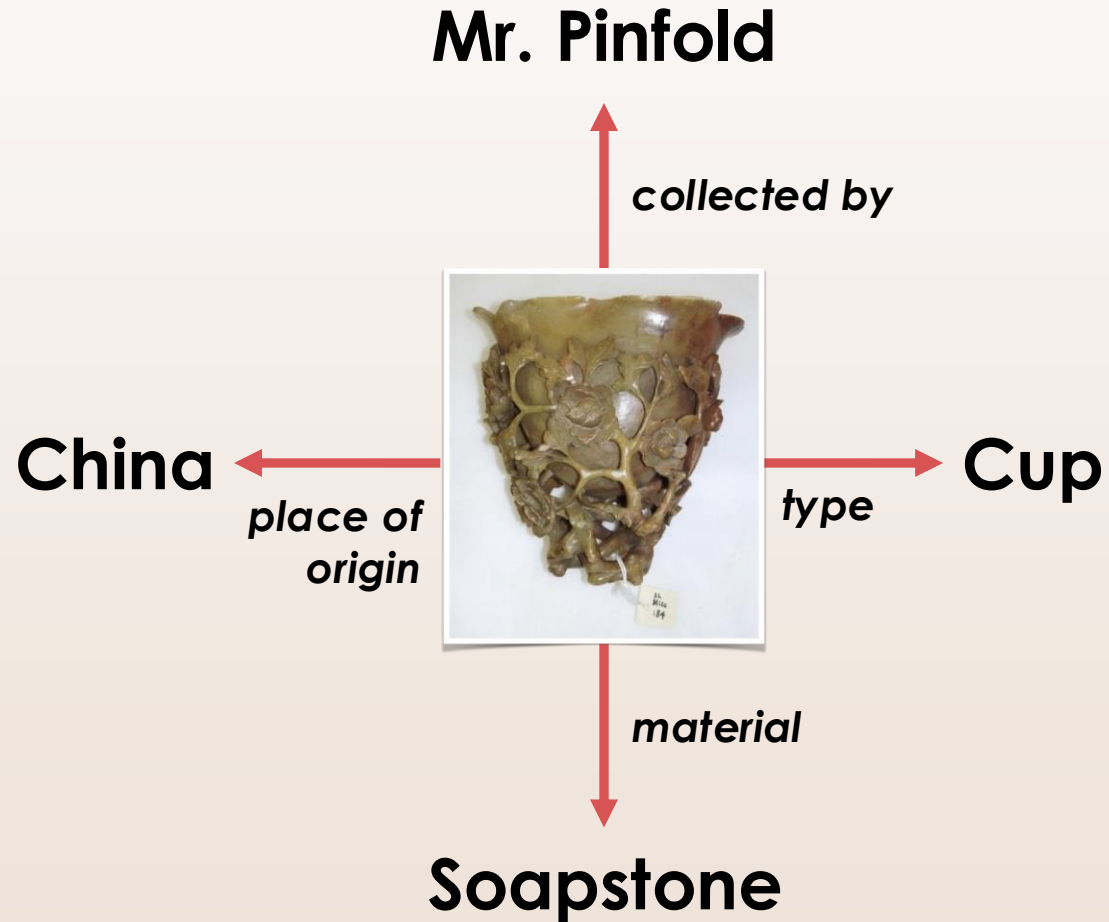


# The Object Problem

- Often we cannot rely on objects to connect historical and contemporary catalogues
- Moreover, it is challenging to “identify the boundaries between ‘object names’ and their qualifying descriptions”



# Object vs. Record





# Absences

## Many Different Kinds of Absences

- **Objects** that are unidentified, lost, destroyed or elsewhere
- **People** who are mentioned but whose identity is unknown
- **People** who are not mentioned at all
- **People/Places** that are mentioned in vague terms
- ... and more

# Absences – Case Study

- **Quantify** absent objects
- **Classify** their status
- **Visualise** an overview

Miscellanies

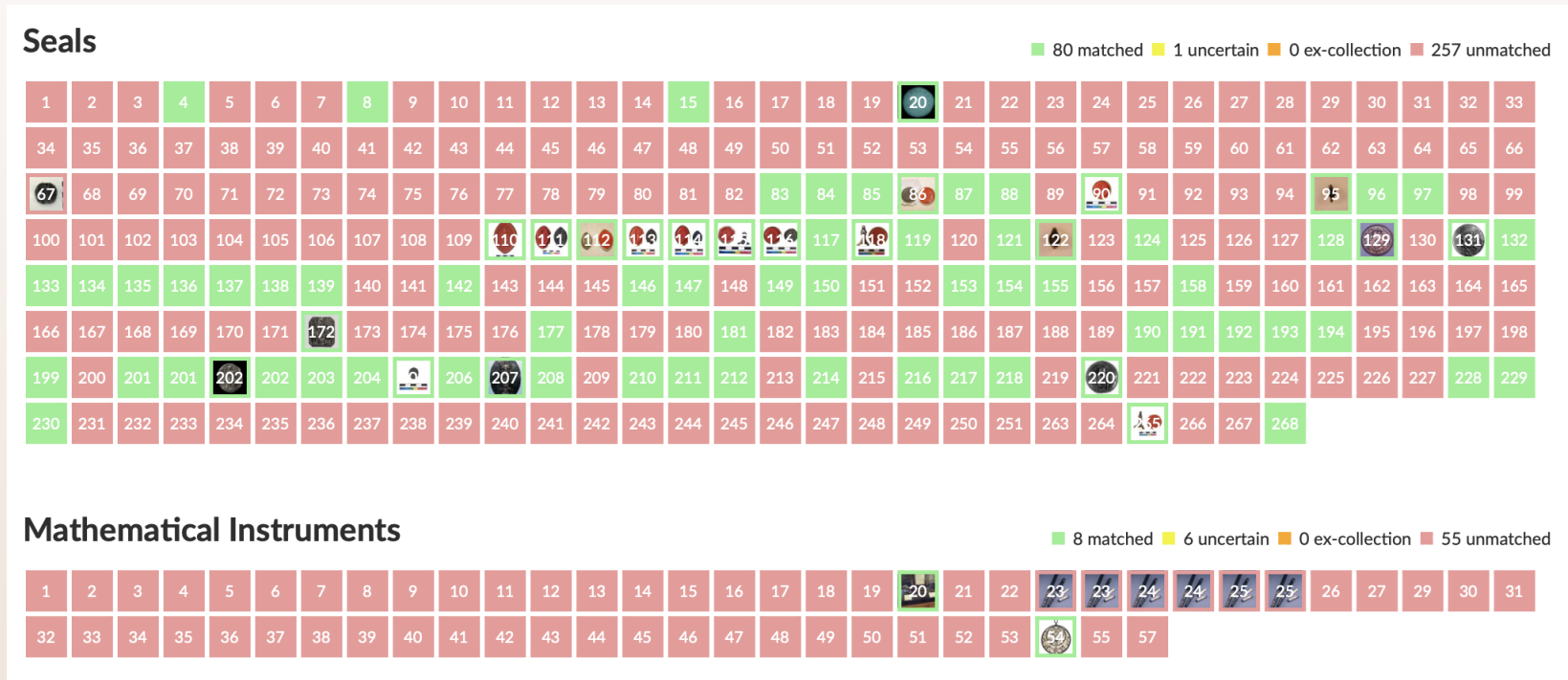
■ 260 matched ■ 8 uncertain ■ 2 ex-collection ■ 2109 unmatched

1	2	3	4		6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	20	21	22	23	24	25	26	27	28	29	30	31	32		
33		34	35	36	37	38	39	40	41	42		44	45	46	47	48	49	50	51	52	53	54	55	56	57		60	61		63	64			
65	66	67	68	69	70	71	72	73	74	74	75	76	77	78	79	80	81	82	83		84	85	86	87	88	89	90	91	92	93	94	95		
96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112		114	115	116	117	118	119	120	121	122	123	124	125	126	127	128		
129	130	131				134	135		136	137	138	139	140	141	142		143	144	145	146	147	148		150		151	152	153	154	155	156	157		
	158				159	160	161	162	163	164		165	165	166	167		168		170	171		172	172	173	174	175	176	177	178	179	180	181	182	183
	185	186	187	188	189	190	191	192	193		194	195	196	197	198	199	200		201			204	205	206	207	208	209	210	211		212	213		
214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245			
247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264		265	266	267		268	268	269	270	271	272	273	274	275	276	277	
278	279	280	281	282	283	284	285	286	287		288	288	289	290								291		292	292	293	294	295	296	297	298	299	300	
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496	497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523	524	525	526	527	528		
529	530	531	532	533	534	535	536	537	538	539	540	541	542	543	544	545	546	547	548	549	550	551			552	553	554	555	556	557	558	559		

Miscellanies historical catalogue (partial view)

# Absences – Case Study

- **Compare** different catalogues
- **Investigate** why the objects are not digitally recorded



*Seals and Mathematical Instruments* historical catalogues



- Keyword Search
  - Search for “**Chinese Compass**” and view the British Museum *Record A\_As-SLMisc-1044*
  - Inspect the page, read the curators comment
  - Navigate to the Historic Record “Miscellanies Entry 1044” via Linked Entries
  - Who is Dr Houston according to the Linked Data page from Viaf?
  - Does the Linked Data resolution agree with British Museum Web portal version of who Dr Houston is? (*Hint Find the page from Original Entry (external link)* )
  - You may repeat for other keywords eg “abacus, artefact, cup, figure, teapot”

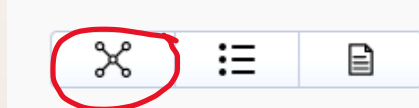
- Advanced Search
  - Use the Advanced Search facility to find **all Chinese compasses** that are catalogued in *Cotemporary Records*.  
(Hint Build your search by using the AND operator to connect two statements)
  - How many compasses exist in the collection?
  - What do we know about Mr Hodson?

- Graph Exploration

- From the home page and from *Datasets Available in Private Beta* **click on** *Miscellanea (7 catalogues)*

- Inspect the page, and click on any object of your preference in **green** background

- From the landing (metadata record) page access the graph view by clicking on the respective icon



- From the **Connections** (Navigation Menu) select the top option **All** and click in **Add all** button

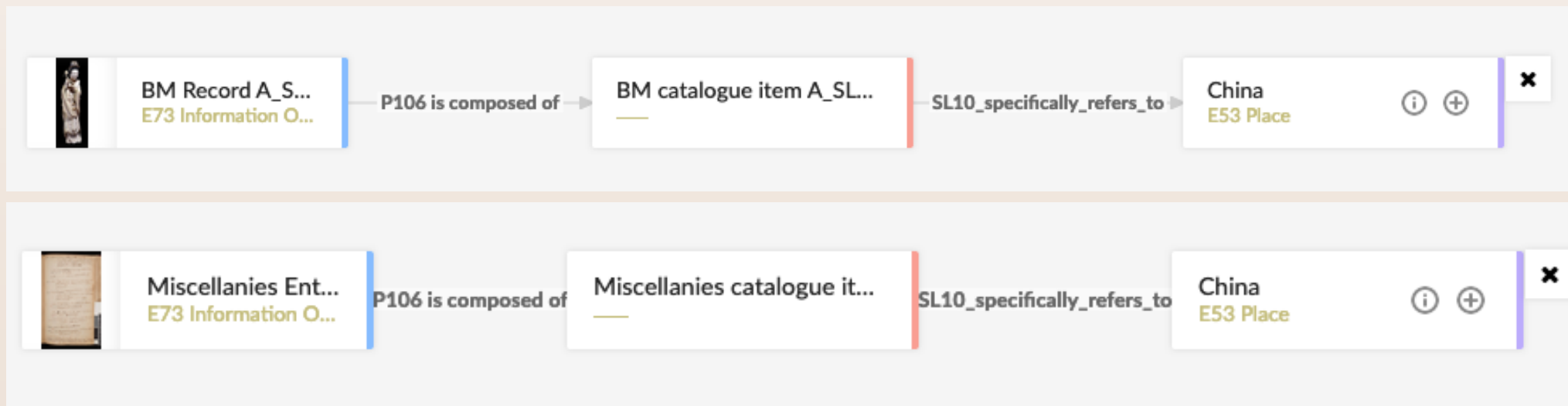
- Every box (entity) provides access to Navigation Menu and Knowledge Panel via the round button ! and +



- Explore the graph to find the linked object via the property **SL15\_believed to be the same as**

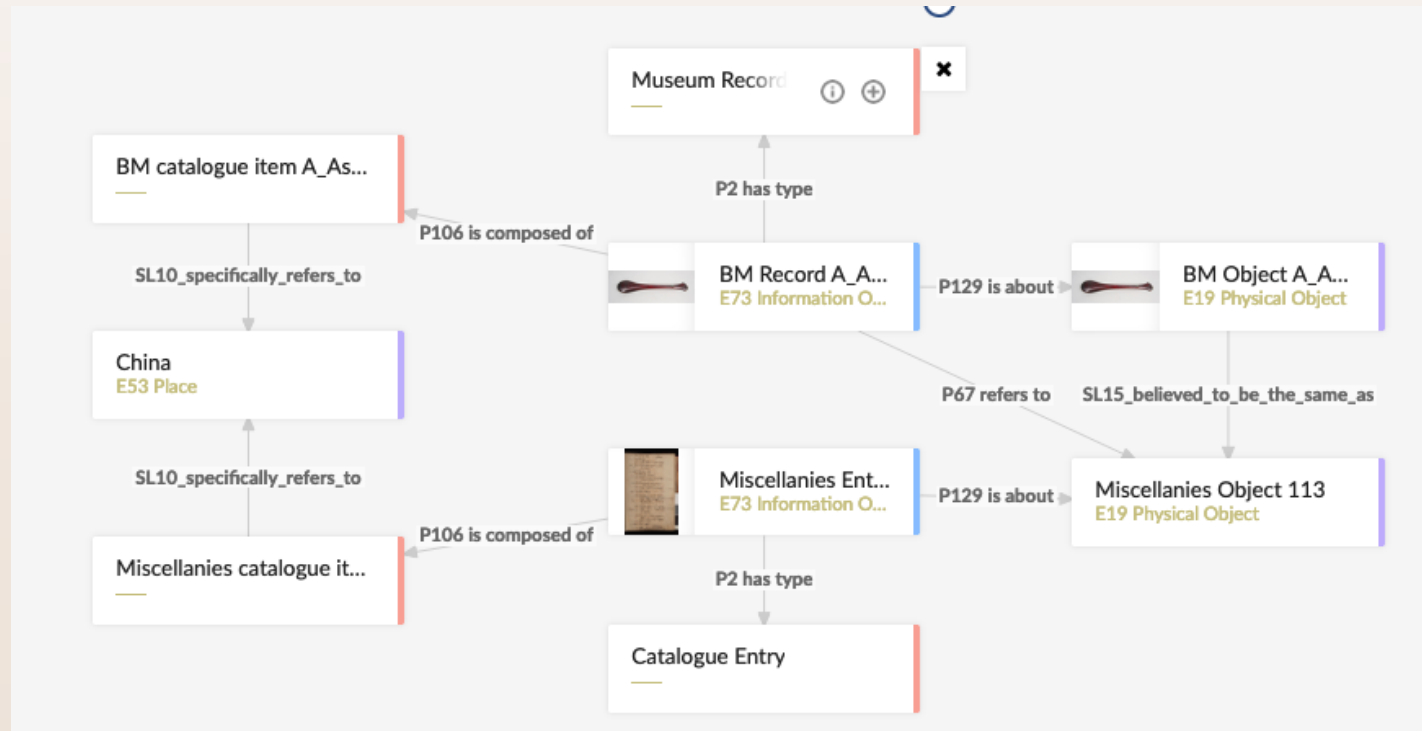


- Select all records that refer to China as a Place (i.e. E53 Place).
- How the query ensures that matches come from place China?
- How many items the query retrieves?
- Alter the query to retrieve only matches for records originating from the British Museum collection



# Hands On – Querying the Knowledge Graph

- Select all *Museum records* that relate to China as a place and matched against *Historic records* (catalogue entries) that are **believed to be about** the same physical object
- Both Museum and Historic records should refer to China (E53 Place)
- The SL15\_believed\_to\_be\_the\_same\_as property should be used





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