

## Semantic technologies for historical collections: A case study from the Sloane Lab Knowledge Base

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Sloane an **exemplary case study** to unite surviving objects (current digital collections) and records across the NHM, BM and BL from the original catalogues

Reunify and extend digital collection Searchable and amenable to further analysis and interpretation

















**UC** 





### Infrastructure



#### Data Model



The **Sloane Lab data model** allows us to represent the **knowledge** collected in the project



Based on **Semantic Web** standards and built on top of the **CIDOC CRM** reference model



Centred on the **record** instead of the **object**, to support multiple perspectives over the same object



### CIDOC - CRM

- The CIDOC CRM (Conceptual Reference Model) ontology is an international standard (ISO 21127:2006) and provides a real world, empirically based representation aimed at harmonizing heterogeneous data.
- The CRM provides a core ontology that can harmonise between museum, archive, library, and other specialised cultural datasets
- 81 Classes and the 160 Properties





### CIDOC - CRM



Source: https://www.cidoc-crm.org/



#### Sloane Lab Data Environment Charting all data available to project

DABLE

#### NATURAL HISTORY MUSEUM

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#### ROYAL SOCIETY

#### **Draft Minutes**

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#### **Enlightenment Architectures**

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#### Sloane Letters

gitised Letters written to and from Sloane

#### Footnotes

1 Also available in Enlightenment Architectures as "Digital edition of Sir Hans Sloane's Catalogue of Fossils including Coralls, Serpents, Echini, Crustacea, Starrfishes, Humana (h

- Alio available in trightement Arbitectures is "Digital edition of Shrien Soader's Catalogue of exists including Caraits, Respects, Lohn, Costalos, Mattimides, Humana (V Alio available in States Letters as "3,300 Searchable Letters"
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- Also available in British Library as "Sloame MS 3972 C VI"
   Also available in British Library as "Sloame MS 3972 C VI"
   Also available in British Library as "Sloame MS 3972 B"
   Also available in British Museum as "Miscellanea vol"
   O Also available in Natural History Museum as Fossils vol 1

- 11 Also available in Natural History Museum as Fossils vol 5
- 12 Available in British Library as "Sloane Correspondence

#### Colour index

#### Colour-coding is only applicable to cells relating to data sources

- Digital Available digitally and available publicly
- Digital In the process of becoming available
- Tangible artefact
- Permanently destroyed



### 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"





### **Information Object Focus**







#### **Challenges - Historical Catalogue**

1. A parill of knuis with bone burnt in the find of low <div3>

No identifier for the catalogue entry

### Identifiers for people & places

```
<ea:catnum type="primary" place="margin">1.</ea:catnum>
A <measure>parcell</measure> of <add rend="underline">knives</add> with
        <material>bone</material><lb/> hafts burnt in the fire of
        <placeName ref="#London">London</placeName>.
```

<**p**>

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<add rend="pencil">&lt; 245</add>
<add rend="pencil">
<add rend="del">216.f3</add>
</add>
</div3>
```



### **British Museum Data**



(Miscellanies) (Miscellanies)



### Further Challenges – Uncertainty

Aggregating records and integrating them into a single knowledge base

Handling **uncertainty** in records

Modelling inconsistencies among the records

Identifying **data absences** and attempting to remedy them

-1100. A large reed <u>pipe</u> from the great Mogols country from
M <sup>r</sup> . Dupuys.
b √ 245.

#### smoking-pipe

Object Type	
smoking-pipe	

Museum number As.SLMisc.1100

#### Description

Bamboo smoking pipe with hole drilled in centre, through only one side. Bands of incised geometric patterns mainly to each end, but also a floral design to one side of the drilled hole.

Production date 18thC

Production place Made in: <u>India (pre-1947)</u> (?) Asia: South Asia: India (pre-1947)





#### Extensions to CIDOC - CRM

- Sloane Lab Catalogue Item
- Each record or entry may refer to one or more people (E21), places (E53), materials (E57), techniques (E29 Design or Procedure), or other entities that are associated to the object. We view each of these references as an individual part of the record/entry that we call catalogue item (Sloane Lab SL1).
- Each catalogue item has a specific type and is about one or more entities of this type.
- Each catalogue item may also have a **confidence level** (to represent uncertainty), and possibly a **note** attached to it.



#### Sloane Lab – Catalogue Item





### Linking Multiple Records

- Multiple records (or entries) can be linked to each other when they refer to the same physical object or when they mention the same entities (people, places, etc.).
  - However, linking through the physical object is problematic because many physical objects have not been preserved, and in some cases the connection is uncertain.
- For these reasons, instead of going through the physical object, we have decided to link the records (or entries) through the **identifier** (E42).



# Linking of a museum record to a historical catalogue entry





### Modelling Identity

- In many cases, two records (or entries) will mention the same entity. For example, Miscellanies 1368 mentions a person called "Mr. Clerk", while the BM record for the corresponding object mentions "Clerk" as the field collector.
- Two entities that are believed to be the same can be linked together through the property SL16 believed to be the same as. However, it would be impractical to directly connect each "Clerk" entity to all related "Clerk" entities



# Linking of entities mentioned in different records





### Example – SL Semantics



20



### Conclusions

- CIDOC- CRM a de facto standard in CH
  - Extension can unlock domain specific challenges
- Persistent Identification
  - different identifiers used by institutions, make sense of them, and connect them to the Sloane Lab identifiers
- The role of museum-based vocabulary resources towards the realisation of unified collections
  - opportunities for semantic enrichment, linking and interoperability



## Semantic technologies for historical collections: A case study from the Sloane Lab Knowledge Base

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