



# Types of burial data and proposal of a Mortuary Data Application Profile for ARIADNEplus (WP4.4.14)

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## Revision history

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<i>28/09/2022</i>	<i>1.1</i>	<i>Revisions after integration of THANADOS data:</i> <ul style="list-style-type: none"><li>● <i>Revised summary text</i></li><li>● <i>Added a revised figure 3</i></li><li>● <i>Revised captions of figure 3 and removed notes that were after Figure 3</i></li><li>● <i>Added section 5 on recommendation of ARIADNE subjects</i></li><li>● <i>Added section on THANADOS</i></li><li>● <i>Added mappings to AO_Collection and AO_Individual_Data_Resource from THANADOS integration</i></li></ul>	<i>Edeltraud Aspöck Maria Theodoridou</i>

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## 1. Summary

*The objectives of this document are: First, the analysis and description of the different types of mortuary data that are to be integrated in the ARIADNE infrastructure. Data types will be described in relation to the research workflow. Secondly, this document will provide recommendations for data providers mapping their mortuary data to the ARIADNE infrastructure for item-level integration. The so-called ARIADNE Mortuary Data Application Profile (AP) is an extension of the ARIADNE project ontology and based on the CIDOC CRM and extensions. It will enable users to cross-query datasets from different providers via the ARIADNE infrastructure.*

## 2. Introduction

The ARIADNEplus Ontology is a modular ontology for expressing the statements of the ARIADNE infrastructure and the information it aggregates. The ontology is designed to achieve integration and establish interoperability among aggregated data. It is able to provide layers of query across the integrated semantic graph it implements and it is structured into sub-ontologies, including a Catalogue ontology (AO-Cat) that provides terms for the statements in the ARIADNE Catalogue, and several Application Profiles (APs), providing terms for the domain-specific parts of the ARIADNE infrastructure.

Mortuary archaeology consists of a series of research activities and analyses carried out either directly on mortuary evidence (archaeological evidence containing human remains or contexts that are interpreted to relate to the disposal of the dead), and/or on documentation and finds (human remains, objects, samples) from such contexts. Mortuary evidence provides information firstly about ways of disposal of the corpse, past funerary practices, other practices that involved human remains; secondly, mortuary data is used as a proxy for many aspects of past societies, such as identities, migration, social complexity, landscape and memory, beliefs, art and craft, technologies.

Important information for the interpretation of mortuary records comes from human osteology and other science-based analyses of human remains. Hence, mortuary archaeology is closely

related to these fields and integrates their results for synthesis. Osteology informs about age-at-death, sex, stature, pathologies and other characteristics of skeletal remains. Recent major developments of science-based analyses include ancient DNA (e.g. family relationships, mobility) and stable isotopes (nutrition, origin), whilst radiocarbon dating has been around for longer.

Research questions and approaches to the analysis of mortuary data may vary due to historical developments, different scholarly traditions and fields, as well as differences in the archaeological record across archaeological periods and regions.

### 3. Research workflow and types of mortuary data

An analysis of ARIADNEplus partners' datasets/collections from the mortuary domain shows that data are usually generated at different stages of the workflow, involving the participation of different actors and the use of specific devices and software. All these elements are considered relevant in order to define adequate metadata for scientific datasets. Datasets are archived at the various stages of the workflow and made available to be re-examined by the experts who analyse them for new research questions and syntheses, leading to creation of new datasets. The stages at which datasets may be created typically include:

1. Datasets generated in the field with no or only limited post-excavation analysis, which often include information about other types of evidence too. Fieldwork is the starting point of the process. It involves first excavation and documentation of archaeological evidence which contains human remains and features which relate to the disposal of the dead (e.g. pyres, buildings). Secondly, finds and samples are collected from their original archaeological context and the exact place or context of finds and features is recorded in order to guarantee optimal analysis of the record. In some cases, the resulting data may be deposited in an archive, with little or no additional analysis. Certain types of analyses (in particular physical anthropology, taphonomy) are carried out in the field already.

*Examples:* Such datasets would typically come from excavation companies, or governmental organisations recording excavation activities; ARIADNEplus partner datasets that contain field data from cemetery excavations are: ARUP (AMCR), the Hungarian National Museum Database, ADS.

2. Datasets generated as results of analytical workflows based on fieldwork documentation (digital datasets, or, in previous times analogous documentation) and physical objects (human remains and objects) typically concerning data from one site/cemetery; they may include other types of archaeological evidence too.

After excavation, archaeologists and specialists from other fields analyse documentation and finds. This may involve special analysis of the different types of finds (most common are the analysis of human remains by a biological anthropologist; animal bone by an animal bone specialist; finds by a finds specialists; radiocarbon dating in laboratories). It may involve spatial and statistical analysis of the results (e.g. using GIS) by the archaeologists. Digital information is generated as a result of each analysis, resulting in a rich dataset which will ideally be deposited in an archive and, which frequently is accompanied by publication of written account(s) (analogue and digital books and articles). Such datasets typically concern mortuary data from one site. They often include structured data and written reports too.

*Examples:* comprehensively analysed rich data sets, usually from individual cemeteries can be found in datasets by:

- ARUP (AMCR e.g.. <https://digiarchiv.aiscr.cz/id/C-TX-201502523>),
- ADS (e.g. Cuxton Anglo-Saxon Cemetery <https://doi.org/10.5284/1044805>),
- Hungarian National Museum Database (e.g. <https://archeodatabase.hnm.hu/hu/node/1617>),
- E. Fentress (Villa Magna Material <http://archaeologydata.brown.edu/villamagna/the-human-skeletal-remains/>).

3. Datasets that synthesise/aggregate mortuary data. They contain structured data that was extracted from datasets of above types (1, 2) and from publications (articles, books, grey literature). They may also be integrating other structured datasets (3) synthesising information. Such databases typically aim to synthesize information to provide an overview of a certain period and/or region; or data may have been collected to answer a specific research question.

*Examples:*

Datasets on early medieval cemeteries of this type include:

- ZBIVA (<http://zbiva.zrc-sazu.si/>)

- ARUP (database early medieval cemeteries at the periphery of the Carolingian world <https://medcem.aiscr.cz/about>)
- Thanados (<https://thanados.net/>)

Datasets compiled to answer specific research questions can for example be found in ADS (e.g. Anglo-Saxon Graves and Grave Goods of the 6th and 7th Centuries <https://doi.org/10.5284/1018290>), DANS (e.g. In touch with the dead <https://easy.dans.knaw.nl/ui/datasets/id/easy-dataset:66658> ).

Figures 1 and 2 provide a graphical representation of the research process and its resulting datasets.

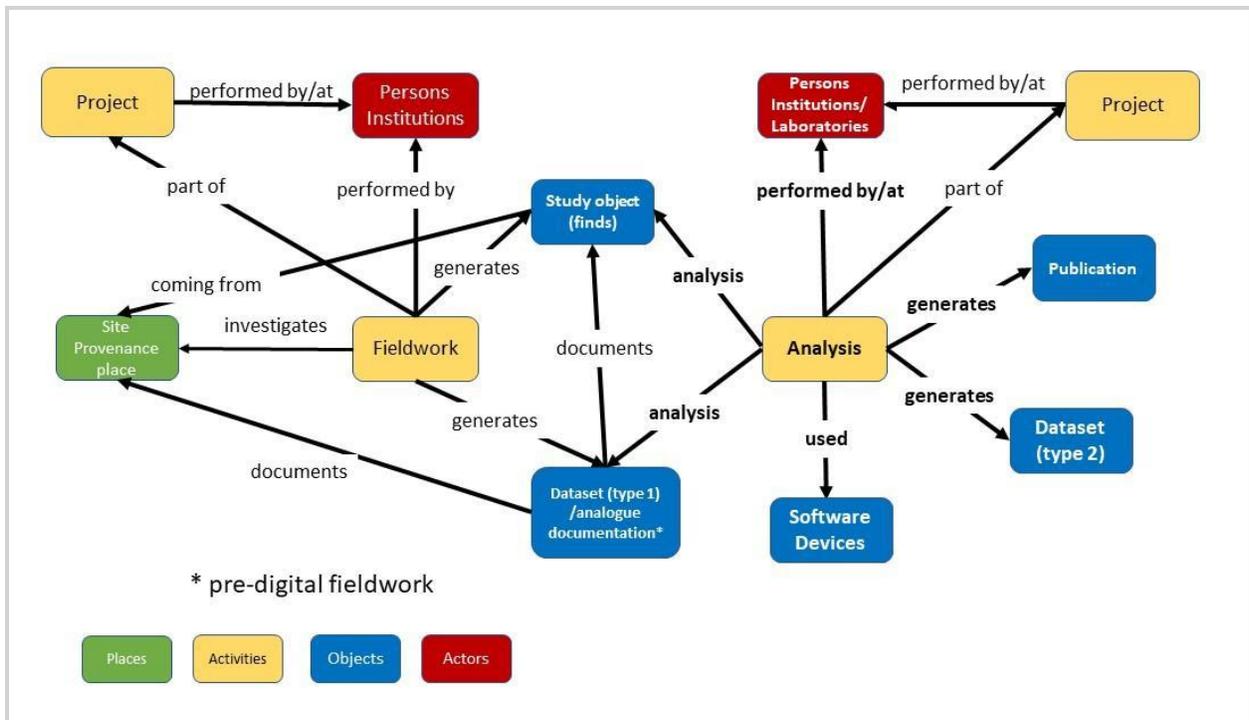


Figure 1: Entities and relationships of activities in mortuary archaeology leading to datasets type 1 and 2.

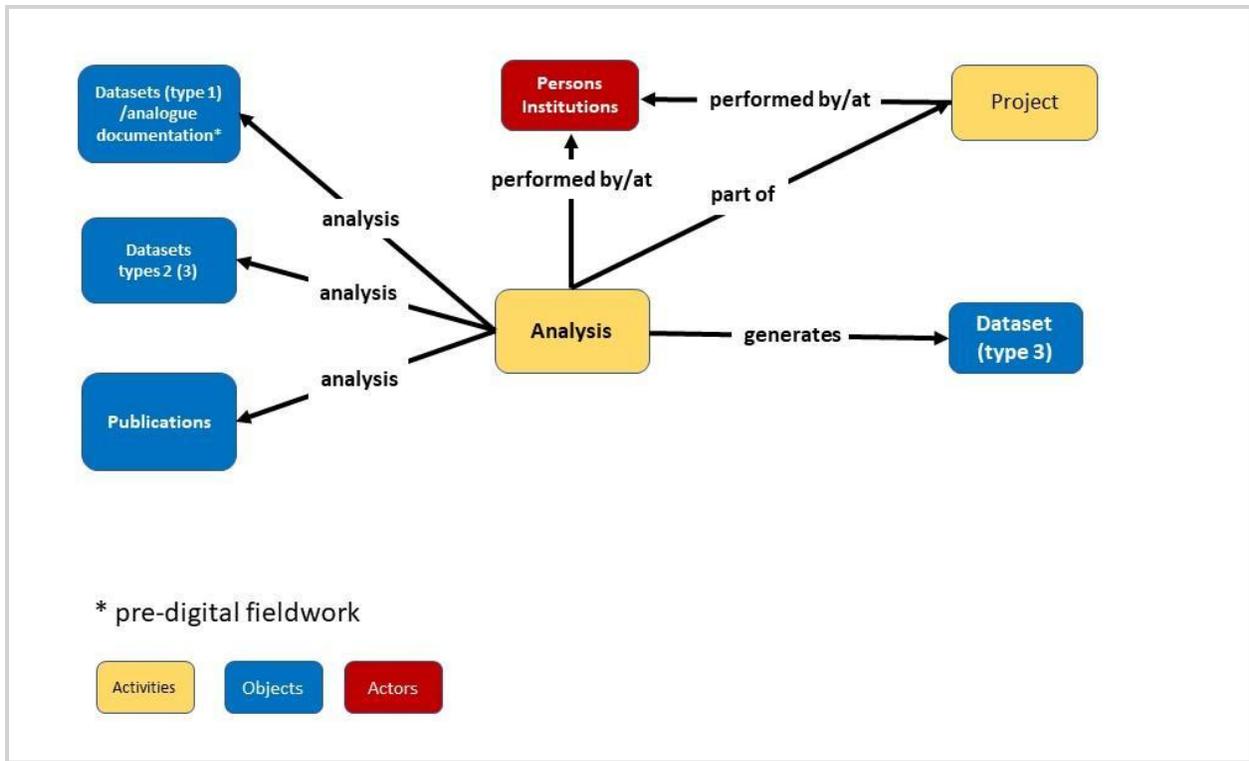


Figure 2: Entities and relationships of activities leading to datasets type 3.

## 4. Recommendations for ARIADNEplus

Datasets of above type 1, i.e. field data from the mortuary domain can be treated like a ‘fieldwork archive’. However, for users to be able to understand that these are datasets related to burials we recommend to in addition also map to the ARIADNEplus subject ‘burial’. However, as these types of datasets will only be described at the collection level for integration into the ARIADNE Catalogue, the properties and classes of the AO-Cat are sufficient.

Datasets of the type 2 would also fall under the category fieldwork archive, but datasets of the type 3 category fall under the ARIADNE subject ‘Site/Monument’. Again, it is recommended to also map datasets of this type to the subject ‘burial’ in addition, to increase the chances of users to find them. Whilst AO-Cat properties will be sufficient to describe these datasets on the collection-level (e.g. its geographical extent, date range and categorisations), for item-level integration it will be necessary to make use of the CIDOC CRM and extensions - this will be described in the next section of this document.

## 5. Proposal of a Mortuary Data Application Profile (AP) for item-level integration of mortuary data

Early medieval cemeteries have the advantage that they show a high degree of similarity of the evidence. For a test mapping and the development of the AP we chose the early medieval burial database 'In Touch with the Dead' by Martine Van Haperen.<sup>1</sup> This is a relational database that holds information about eleven early medieval cemeteries in the Low Countries and it was compiled for a PhD thesis at Leiden University. It includes basic information on all context types (inhumation and cremation graves, animal graves, pits, ditches, stray finds), human remains and grave goods. In addition, it contains detailed information on the different types of post-depositional interventions which were the focus of investigation. It consists of 7 main tables and 29 reference tables that were mapped using the 3M mapping tool (test mappings 684 and 685 can be found on D4Science<sup>2</sup>).

The resulting Mortuary Data AP was tested during the integration of the 'THANADOS anthropological and archaeological database of sepultures'<sup>3</sup> into the ARIADNE infrastructure. THANADOS is an open source and open access online application that intends to present all so far published archaeological and anthropological data on early medieval cemeteries in nowadays Austria. The data are stored in a PostgreSQL/PostGIS database and structured according to classes and properties of the core CIDOC CRM.<sup>4</sup> THANADOS uses its own vocabulary to classify/categorise its data.<sup>5</sup> Where available the vocabulary entries are linked to corresponding entries of controlled vocabularies, e.g. Getty Arts and Architecture Thesaurus (AAT), Geonames, Wikidata. An API provides various output formats for the respective entities. In order to harvest data for ARIADNE Plus an XML representation of each cemetery with its

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<sup>1</sup> Haperen, M.C. van (Leiden University) (2017): In Touch with the Dead: Early Medieval Grave Reopenings in the Low Countries. DANS. <https://doi.org/10.17026/dans-x6b-bvgj>

<sup>2</sup> [https://ariadne.d4science.org/group/ariadneplus\\_mappings/mapping-tool](https://ariadne.d4science.org/group/ariadneplus_mappings/mapping-tool)

<sup>3</sup> <https://thanados.net/>

<sup>4</sup> Eichert, S. (2021). Digital Mapping of Medieval Cemeteries: Case Studies from Austria and Czechia. *Journal of Computational Cultural Heritage* 14, 1 (3), pp. 1–15. <https://doi.org/10.1145/3406535>

<sup>5</sup> <https://thanados.net/vocabulary>

graves, human remains and finds was developed. The following presentation of the Mortuary Data AP is structured according to the typical entities of a cemetery database (Fig. 3): Site (cemetery or other site types containing mortuary deposits); feature (different types of graves, ditches, pits and other features that contain mortuary deposits); mortuary deposit (the deposit of human remains and other finds, including containers and furniture); finds (human remains, artefacts, animal remains, samples). To make the AP easier to use, we have structured the mappings according to the ARIADNE main questions: Where? When? What? For a semantically rich description of mortuary deposits (i.e. more on the ‘What?’) that would allow integration on the item-level the ARIADNEplus ontology was not sufficient and we in addition used classes and properties from CIDOC-CRM (Doerr 2003) and the following extensions:

1. CIDOC CRM – The base model, version 6.2.1<sup>6</sup>
2. CRMsci – Scientific observation model, version 1.2.2<sup>7</sup>
3. CRMarchaeo – Excavation model, version 1.4.1<sup>8</sup>

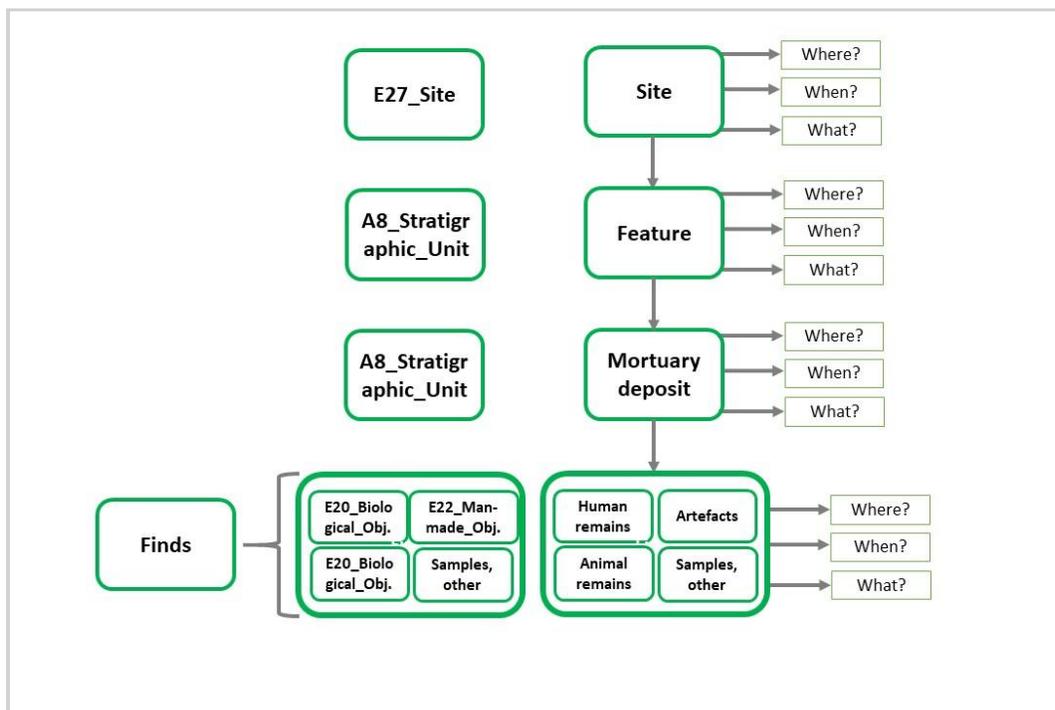


Figure 3: Typical hierarchical structure and entities of early medieval cemetery databases. Site is the

<sup>6</sup> <https://www.cidoc-crm.org/>

<sup>7</sup> <https://www.cidoc-crm.org/crmsci/>

<sup>8</sup> <https://www.cidoc-crm.org/crmarchaeo/>

*top-level entity and information on the site would also appear in the ARIADNE collection level metadata, providing information about the location, time period and type of site/cemetery. In early medieval cemeteries the majority of archaeological features would be inhumation graves, but also cremation graves (northern Europe and UK), animal graves and other features (ditches, pits, walls) are common. Archaeologically each feature consists of stratigraphic units. A feature may contain multiple (mortuary) deposits. Finds appear typically as part of mortuary deposits but also in the fill or other features of a cemetery. Finds may include the human remains, objects from the dress and sometimes parts of dress, containers or traces of them, additional objects (grave goods) such as weapons, tools, pottery, animal remains and samples.*

### **Modelling the relativity of data: E13\_Attribute\_Assignment**

In our model we are suggesting to use an assignment event (E13\_Attribute\_Assignment) to document that the attribution of types and the observations that were made are to a degree dependent on the methods that were used and on the views of the person who created/curated the database. For our test data 'In Touch With The Dead' (Van Haperen 2017) we use the E13 Attribute Assignment event to document that the data reflect the view of their creator, Martine van Haperen:

```
P140i_was_attributed_by -> E13_Attribute_Assignment -> P14_carried_out_by ->
E21_Person = "Martine van Haperen"
```

### **Site: E27\_Site / AO\_Collection**

On the collection level, data for each site/cemetery will be mapped like site and monuments data. This will cover information about the geographical extent, its date range and in most cases there will also be a classification of a site (e.g. a cremation cemetery, an inhumation cemetery). E27\_Site is defined as relatively immobile material items and features at a particular location and applies to archaeological sites. It is a more precise mapping than E26 Physical Feature or E18 Physical Thing, which are both superclasses of E27 Site. To make a cemetery database visible in the ARIADNE portal, it has to be mapped to the AO-Cat - hence for the THANADOS mappings site has been mapped as an AO\_Collection too.

	Field	Mappings	Rationale
WHERE?	RegionID (other typical field names would be country, district, place...)	<i>has_space_region</i> AO_Spatial_Region_StdName  <i>has_place_IRI</i> Thing	The region where the site is located. In the test dataset regions had been given IDs
	Coordinates	<i>has_space_region</i> AO_Spatial_Region_Point AO_Spatial_Region_Polygon AO_Spatial_Region_BBox	For other regional data such as coordinates use subclasses of 4.7 AO_Spatial_Region
WHEN?	BeginYear (or: 'dates from', 'start date' etc.)	<i>has_time_interval</i> AO_Temporal_Region  <i>from</i> XMLSchema#dateTime	The beginning of the time interval a site has been dated to <sup>9</sup>
	EndYear (or: 'dates until', 'end date' etc.)	<i>has_time_interval</i> AO_Temporal_Region  <i>until</i> XMLSchema#dateTime	The end of the time interval a site has been dated to <sup>10</sup>
	Period	<i>has_time_interval</i> AO_Temporal_Region	For other temporal data use subclasses of 4.6 AO_Temporal_Region
WHAT?	Name	<i>has_title</i> xsd:string	the name and any alternative names of the site/cemetery
	ID	<i>has_identifier</i> xsd:string ( <i>has_original_id</i> xsd:string)	for any identifiers of the site (not relevant for integration of datasets)

<sup>9</sup> Please note: In mapping 684 'ExcavationStartYear' actually refers to the BeginYear of the excavation.

<sup>10</sup> Please note: In mapping 684 'ExcavationEndYear' actually refers to the EndYear of the excavation.

<b>W H A T ?</b>	Site type, cemetery type etc.	<i>has_type</i> AO_Concept  <i>has_native_subject</i> AO_Concept	Adding <i>'has_native_subject'</i> means that the original vocabulary of the database will be integrated in the infrastructure and hence can be queried via the A+ interface. Native site types have to be mapped to AAT: <a href="http://vocab.getty.edu/page/aat/300387004">http://vocab.getty.edu/page/aat/300387004</a>
	Additional properties of a site which are of specific interest to individual data resources (e.g. QualityOfExcava tionID, QualityOfPublic ationID)	<i>has_type</i> AO_Concept  <i>has_type E55 Type</i> "QualityOfExcavationID, "QualityOfPublicationID", "..."	Many fields will be very specific to individual data resources. Hence they cannot (or only rarely) be connected to similar fields in other resources. All these fields should be mapped as 'types'. In our test data this concerns e.g. fields codifying the quality of the excavation (QualityOfExcavationID; to identify bias in the data resulting from excavation method) or from how evidence was analysed and published ('QualityOfPublicationID'). There are many other possible fields that add properties of sites that are considered important for individual research questions.
	SoilTypeID	<i>has_type</i> AO_Concept  <i>has_type E55 Type</i> 'SoilType'  Link to thesaurus	In our test dataset soil types were given IDs. In this case the IDs can be converted to soil types of a thesaurus. Soil types were also considered important to identify bias of information due to preservation of evidence in different soils.
	Literature, Bibliographic reference	<i>is_subject_of</i> AO_Document <i>has_title</i> xsd:string	Field for recording the bibliographic reference

## Feature (Context, grave, pit ...): A8\_Stratigraphic\_Unit / AO\_Collection

In the test database (Mapping 685) the table containing information on the individual features (mostly graves, but also pits, ditches, animal graves, sometimes buildings) was called 'ContextInfo'. We mapped this information as an 'A8\_Stratigraphic\_Unit', as on the most general level we are dealing with physical features that archaeologically are consisting of A2 Stratigraphic Volume Units and A3 Stratigraphic Interfaces. AO\_Object would have been a too general class for that, so it was necessary to move to CIDOC CRM<sup>11</sup>. Some of the item-level records may also be described in AO-Cat, for example a grave with its micro-coordinates and specific data range.

For the THANADOS mappings we decided to make the features AO\_Collections too:  
AO\_Collections -> is\_part\_of -> AO\_Collection (the site, see above).

	Field	Mappings	Rationale
W H E R E ?	CemeteryID	<i>P46i_forms-part-of</i> E27_Site	To relate a grave or other feature to the cemetery/site where it was found (linking two tables in relational databases). Not relevant for integration of datasets.
	Coordinates	has_space_region AO_Spatial_Region_Point AO_Spatial_Region_Polygon AO_Spatial_Region_BBox	For regional data such as coordinates use subclasses of 4.7 AO_Spatial_Region
W H E N ?	BeginYear (or: 'dates from', 'start date' etc.)	<i>has_time_interval</i> AO_Temporal_Region <i>from</i> XMLSchema#dateTime	the beginning (year) of the time interval a grave/feature has been dated to
	EndYear (or: 'dates until', 'end date' etc.)	<i>has_time_interval</i> AO_Temporal_Region <i>until</i> XMLSchema#dateTime	The end (year) of the time interval a feature/grave has been dated to

<sup>11</sup> In the test dataset the information on the archaeological feature 'ContextInfo' contains also all the information on the reopening. This information (reopening and its properties) should ideally have been kept in a different table, as it is quite extensive. At the same time there are extra tables for 'ContextInfoExternallyVisibleStructures' (4.) and on 'ContextInfoRevenantMeasures' (5.) - as there is hardly any information on both it would ideally have been part of 'ContextInfo'.

	Period	<i>has_time_interval</i> AO_Temporal_Region	For other temporal data use subclasses of 4.6 AO_Temporal_Region
<b>W H A T ?</b>	Number (or Grave number, feature ID etc.)	<i>has_identifier</i> / <i>has_original_identifier</i> xsd:string	Not relevant for integration of datasets – to map ID of archaeological feature in original dataset.
	All fields containing typological information and other observations about the grave (and, in our test data about its reopening), for example: ContextTypeID /feature type (e.g. pit, grave, ditch); GraveConstructionTypeID (e.g. chambergrave); ExternallyVisibleStructuresID (e.g. surface marker); 'Reopened', 'DepthOfInterventionPitID', 'RelativeInterventionDateID').	<i>has_type</i> AO_Concept  <i>has_type</i> E55 Type 'ContextTypeID', 'GraveConstructionTypeID' 'ExternallyVisibleStructuresID' 'Reopened', 'DepthOfInterventionPitID', 'RelativeInterventionDateID'  <i>is_native_subject_of</i> AO_Individual_Data_Resource	Adding ' <i>is_native_subject_of</i> - AO_Individual_Data_Resource' means that the original vocabulary of the database will be integrated in the infrastructure and hence can be queried via the A+ interface.  <i>Native feature types have to be mapped to AAT, funerary structures</i> <a href="http://www.getty.edu/vow/AATFullDisplay?find=tomb&amp;logic=AND&amp;note=&amp;page=1&amp;subjectid=300122208">http://www.getty.edu/vow/AATFullDisplay?find=tomb&amp;logic=AND&amp;note=&amp;page=1&amp;subjectid=300122208</a>

<b>W H A T ?</b>	GravePitWidth, GravePitLength, GravePitDepth (i.e. fields containing measurements of the grave pit)	<i>AP15_is_or_contains_remains_of</i> AO_Object A3_Stratigraphic_Interface  ...P2_has_type -> E55_Type = "grave pit"  <i>P43_has_dimension</i> E54_Dimension ...P2_has_type -> E55_Type = "width"  Dimension ...P90_has_value rdf-schema#Literal	The stratigraphic unit contains remains of an object of the type grave pit, that is a stratigraphic interface with the dimension (width, length, depth) of 'xx'.
	CoffinLength, CoffinWidth	<i>AP15_is_or_contains_remains_of</i> AO_Object A2_Stratigraphic_Volume_Unit  ...P2_has_type -> E55_Type = "coffin"  <i>P43_has_dimension</i> E54_Dimension ...P2_has_type -> E55_Type = "length"  Dimension ...P90_has_value rdf-schema#Literal	The stratigraphic unit contains an object of the type 'coffin', that is a stratigraphic volume unit which had the dimensions (length, width),
	AbsoluteReopeni ngYearBegin  /AbsoluteReopeni ngYearEnd	<i>P12i_was_present_at</i> E7_Activity ...P2_has_type -> E55_Type 'reopening'  <i>happens_at</i> AO_Temporal_Region <i>from / until</i> XMLschema#dateTime	The feature was present at another event. In this case it was present at the activity 'reopening', which was an event that took place in the time from (year) / until (year)
	Remarks	<i>has_description</i> xsd:string	For any free text that was added

### **Mortuary deposit: A8\_Stratigraphic\_Unit / AO\_Collections**

In our test dataset, there was no separate entity for each mortuary deposit, but the finds were described as part of the features/graves. However, many cemetery databases will have entities for the individual deposits as there are frequently more than one. Usually, large finds such as coffins or other furniture related to an individual burial will be described as part of this entity. Again, these would have to be mapped as AO\_Collections that are part of features / sites (AO\_Collections).

Measurements of a coffin or other grave furniture may be mapped analogue to the mapping of the size of the grave pit. For example, a stratigraphic unit contains an object of the type 'coffin', that is a stratigraphic volume unit which had the dimensions length and width.

### **Finds (grave goods, artefacts): AO\_Object & E22\_Man-made\_Object / AO\_Individual\_Data\_Resource**

We decided to use both, E22 (man-made object) as well as AO\_Object. The class AO\_Object allows to use all the AO-Cat properties. AO\_Object is a subclass of E18 Physical Thing.

For the THANADOS mappings we decided (in order to align with the portal) to map all finds to AO\_Individual\_Data\_Resource.

	<b>Fieldname</b>	<b>Mappings</b>	<b>Rationale</b>
<b>W H E R E ?</b>	InterventionArea	<i>P53_has_former_or_current_location</i> A2_Stratigraphic_Volume_Unit	The stratigraphic location of a find. In the test data it has been specified if a find was found in a stratigraphic volume which was disturbed.
	Coordinates	<i>has_space_region</i> AO_Spatial_Region_Point AO_Spatial_Region_Polygon AO_Spatial_Region_BBox	For other regional data such as coordinates use subclasses of 4.7 AO_Spatial_Region

W H E N ?	Period	AO_Temporal_Region	For other temporal data use subclasses of 4.6 AO_Temporal_Region
	BeginYear (or: 'dates from', 'start date' etc.)	<i>has_time_interval</i> AO_Temporal_Region from <i>XMLSchema#dateTime</i>	the beginning of the time interval a find has been dated to
	EndYear (or: 'dates until', 'end date' etc.)	<i>has_time_interval</i> AO_Temporal_Region <i>until</i> <i>XMLSchema#dateTime</i>	The end of the time interval a find has been dated to

W H A T ?	ID (find number)	<i>has_identifier</i> xsd:string	Identifiers – but not used for data integration
	Find type (test data: ObjectTypeID)	<i>has_type</i> AO_Concept <i>is_native_subject_of</i> AO_Individual_Data_Resource	Adding ' <i>is_native_subject_of</i> - AO_Individual_Data_Resource' means that the original vocabulary of the database will be integrated in the infrastructure and hence can be queried via the A+ interface.  <i>Native find types have to be mapped to AAT</i>
	Material (MaterialID)	<i>P45_consists_of</i> E57_Material	The material a find is made of. In the test database materials were provided with IDs. To link with more universal scheme link to a thesaurus e.g. metal by composition: <a href="http://www.getty.edu/vow/AATFu/IDisplay?find=copper&amp;logic=AND&amp;note=&amp;page=1&amp;subjectid=300010901">http://www.getty.edu/vow/AATFu/IDisplay?find=copper&amp;logic=AND&amp;note=&amp;page=1&amp;subjectid=300010901</a>
	NumberOfObjects	<i>P43_has_dimension</i> E54_Dimension  ... <i>P2_has_type</i> -> E55_Type = 'numeral'  E54_Dimension <i>P90_has_value</i> rdf-schema#Literal	The number of objects of a certain type, e.g. 2 brooches
	Other properties of finds, for example (test data): ChristianSymbolism, ElaboratelyDecorated, Intentional damage, complete	<i>has_type</i> AO_Concept  <i>has_type</i> E55 Type "ChristianSymbolism", "ElaboratelyDecorated	Classifications of finds such as whether they are showing Christian symbolism are often subject to discussion and may represent the personal opinion of the researcher and may change over time. This relativity is covered by mapping the whole database to E13 (Attribute assignment) and providing the name of the researcher

**Finds (human and animal remains): AO\_Concept & E20\_Biological\_Object /  
AO\_Individual\_Data\_Resource**

For the THANADOS mappings we decided (in order to align with the portal) to map all finds to AO\_Individual\_Data\_Resource.

Analogue to assignments by archaeologists, the assignments of properties to other finds such as human remains are to a degree dependent on the scientist, i.e. biological anthropologist and the methods used. Hence all data on skeletal remains will be mapped an attribute assignment (E13) too:

*P140i\_was\_attributed\_by* - E13\_Attribute\_Assignment - *P14\_carried\_out\_by* - E21\_Person = "Name of biological anthropologist"

	Fieldname	Mappings	Rationale
<b>W H E R E ?</b>	Location of parts of a skeleton in the grave, e.g. test data fields 'SkullVerticalLocationID', 'ThoraxVerticalLocationID' etc.	<i>P53_has_former_or_current_location</i> E53_Place  <i>P2_has_type</i> AO_Concept	Mapping of parts of a skeleton that were found in certain areas of a grave
	Coordinates	<i>has_space_region</i> AO_Spatial_Region_Point AO_Spatial_Region_Polygon AO_Spatial_Region_BBox	For other regional data such as coordinates use subclasses of 4.7 AO_Spatial_Region
<b>W H E N ?</b>	Period	AO_Temporal_Region	For other temporal data use subclasses of 4.6 AO_Temporal_Region
	BeginYear (or: 'dates from', 'start date' etc.), e.g. radiocarbon data	<i>has_time_interval</i> AO_Temporal_Region from <i>XMLSchema#dateTime</i>	the beginning of the time interval a skeleton has been dated to

	EndYear (or: 'dates until', 'end date' etc.) e.g. radiocarbon data	<i>has_time_interval</i> AO_Temporal_Region <i>until</i> XMLSchema#dateTime	The end of the time interval a skeleton has been dated to
<b>W H A T ?</b>	Properties attributed by the physical anthropologist, such as sex, age at death, pathologies, preservation; position of the skeleton.	<i>has_type</i> AO_Concept  has_type E55 Type 'Sex' 'AgeAtDeath'	Different classificatory systems are being used by physical anthropologists To integrate original vocabulary of the database in the infrastructure and allow querying via the A+ interface add: is_native_subject_of AO_Individual_Data_Resource