

## PART 1: PRINCIPLES

In this section, we explain some of the foundational concepts and aims of MANTO. As you read through, you will no doubt have many questions: a much deeper explanation of the project appears in Part 2.

### 1.1 Ontology

Every digital project requires a formal ontology. This precise description of the material to be analyzed provides a conceptual foundation for the data model that everyone must then work within. By necessity, our ontology simplifies and homogenizes the complexities of Greek mythic storytelling in practice; nonetheless, it offers a pragmatic set of standards broadly appropriate to the diverse ancient texts that we will use for data collection.

We posit that a single timeline runs from the beginnings of the world to the present. On this timeline we recognize two distinct 'periods', the *spatium mythicum*, and the *spatium historicum*. These constitute distinct 'worlds' with their own norms of geography, temporality, biological and physical possibility, and social organization. So, for example, whereas people in the *spatium mythicum* may be born directly from the earth (i.e. by autochthony), this is not possible in later periods of the Mediterranean's history. Equally, whereas events in the *spatium historicum* can be known to have taken place in specific years, months, and even days; in the *spatium mythicum* time can be marked only by generations, reigns, or using the relative markers offered by significant events. Nonetheless, because these two worlds exist on the same timeline, the impacts of events that took place within the *spatium mythicum* are still discernible in the *spatium historicum* (see fig. 1).

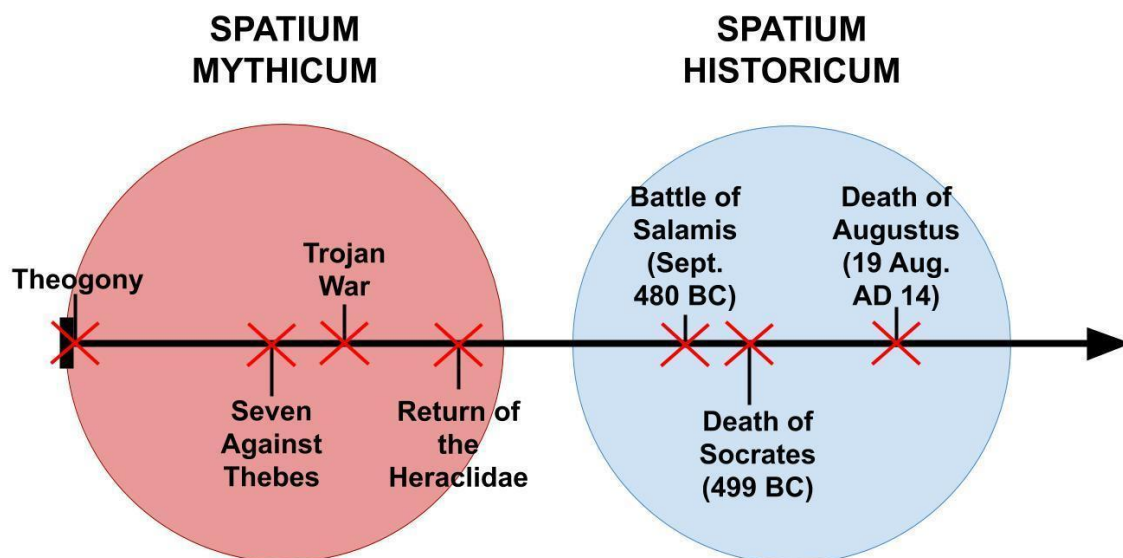


Figure 1: MANTO ontology for the Greek past (graphic: G. Goodwin)

In MANTO, the single most significant structure within the *spatium mythicum* is a network of relationships that connects the various ‘entities’ (people, places, objects etc.) that exist within it. Entities in the dataset possess a basic ontological fixity: they are stable, unchanging, and identifiable. We then collect ‘ties’ that express connections between these mythical entities, and between them and entities in the *spatium historicum*. Each tie represents an assertion of fact found in an ancient source and is entered into the database without consideration of its inherent validity. But because such assertions *are* likely to be falsified by or to bolster other factoids collected elsewhere, as we build our dataset we will see contestation and uncertainty emerge. Thus, these ties constitute the part of the data model that conveys the *unstable* messiness of Greek myth.

MANTO is designed primarily to construct a massive relational dataset. The ties between entities in this network represent asserted interactions; they are proxies for myths told in antiquity, but we are not in fact modelling the narrative material directly. In keeping with this approach, every tie identified in the corpus of ancient literature exists in MANTO as a piece of data independent of all others, and not as an episode in a much larger diachronic account. MANTO is thus a paradigmatic approach to Greek myth: it proceeds by breaking up myth into small data in order to achieve the fullest view possible of the whole.

In the sections that follow, we give an overview of the entities and ties that form the basis of MANTO’s data model.

## 1.2 Entities in the *spatium mythicum*

For the purposes of this project, we define the *spatium mythicum* as extending chronologically from the earliest time (the Theogony) to five generations after the return of the Heracleidai to the Peloponnese. Every entity in this storyworld belongs to one of the following categories:

- ❖ AGENTS: Person-like entities with agency, e.g. gods, heroes, monsters
- ❖ COLLECTIVES: Groups of agents with recognizable collective identities, e.g. the Argonauts, the Centaurs. (Collectives are further identified as episodic, genealogical, or miscellaneous)
- ❖ OBJECTS: Moveable, object-like entities without agency and with specific identities, e.g. the Scepter of Agamemnon, the Club of Heracles
- ❖ LANDMARKS: Immovable buildings or smaller natural features, e.g. the Tomb of Amphion, the Spring of Arethusa
- ❖ PLACES: Significant geographical locations in the mythic storyworld, e.g. Athens, the Underworld, Mount Olympos, River Scamandros
- ❖ EVENTS: Significant events with broad significance, e.g. the Trojan War, the Return of the Heracleidai

For more detail about these categories of entities, see 2.4, 2.5.

## 1.3 Entities in the *spatium historicum*

Because many ancient authors describe how myths still impacted their present (i.e. the *spatium historicum*), MANTO also needs to accommodate entities which came into existence after the

*spatium mythicum*. (For the purposes of this project, we define the *spatium historicum* – quite bluntly – as the entire period after the end of the *spatium mythicum*, i.e. beginning 6 generations after the return of the Heracleidai.) But whereas we are trying to create as comprehensive a model of the networks of the *spatium mythicum* as we can, we limit our data collection regarding the *spatium historicum* to the following phenomena:

- ❖ RELICS surviving in the historical world which were objects or landmarks created in the *spatium mythicum*.
- ❖ An historical person or group claiming ANCESTRY from a mythical agent or collective.
- ❖ EPIPHANIES of mythical agents or collectives in the historical world.
- ❖ PROPHECIES from mythical agents and collectives. (We exclude instances in the historical period where the source of the prophecy is an Olympian god or personification.)
- ❖ REPRESENTATION of mythical entities made in the historical world. (We exclude representations of Olympian gods and personifications except in instances of clear narrative content.)
- ❖ CULT SITES created in the historical period which attest a relationship between mythical entities which would not otherwise be captured in the data. (We exclude cult sites dedicated to Olympian gods and personifications that have no connection to the *spatium mythicum*.)
- ❖ IDENTIFICATION of a mythical place with an historical location (i.e. implicit METANOMASIA).
- ❖ Events in the historical period which are required to act as TIMEMARKS for (esp.) the existence of mythical relics.
- ❖ MOVEMENT of relics during the historical period (e.g. transferal of tombs of heroes, plundering of sanctuaries)

Some of these phenomena involve manifestations of mythical entities in the *spatium mythicum*. So, an object in the *spatium mythicum* survives as a relic in the *spatium historicum*, an agent or collective is treated as an ancestor, or manifests as an epiphany, or is the source of a prophecy. Others, however, do require the creation of entities which existed entirely in the *spatium historicum*. These are:

- ❖ PLACES, LANDMARKS, OBJECTS on which mythical entities are represented.
- ❖ PLACES that are asserted to be the locations of mythic places.
- ❖ EVENTS that are required to act as timemarks.

These historical entities are created in the same way as other entities.

## 1.4 Ties

We use ties to express connections between entities in our dataset. Each tie represents the abstract form of a factual assertion made (or implied) in a specific passage of text from the Greco-Latin corpus.

All ties in MANTO have the form of a grammatically-standardized sentence, based on the semantic triple (subject - predicate - object), but with modifications and additions to allow us to capture more complex situations. The sentence can have the following elements:

- ❖ Subject(s)

- ❖ Predicate
- ❖ Direct Object(s)
- ❖ Indirect Object(s)
- ❖ Prepositional phrase(s)
- ❖ Genitive absolute(s)
- ❖ Purpose clause(s)

The 'nouns' in this sentence must be supplied from our dataset of entities; the predicate is supplied from our list of interactions; allowable prepositional phrases, genitive absolutes, and purpose clauses are also specified in our data model. (These are all listed 2.8 – 2.14.) Figure 2 shows some examples of actual ties in our dataset from Apollodoros, *Library 2*:

<i>Subject</i>	<i>Predicate</i>	<i>Direct Object</i>	
<b>APIS</b>	<b>is eponym of</b>	<b>APIA</b>	<b>(2.1.1)</b>

<i>Subject</i>	<i>Predicate</i>	<i>Direct Object</i>	<i>Prepositional Phrase</i>	
<b>IO</b>	<b>marries</b>	<b>TELEGONOS</b>	<b>in EGYPT</b>	<b>(2.1.3)</b>

<i>Subject(s)</i>	<i>Predicate</i>	<i>Direct Object(s)</i>	
<b>THERIMACHOS and CREONTIADES and DEICOON and IOLAOS</b>	<b>is child of</b>	<b>HERACLES and MEGARA</b>	<b>(2.4.11)</b>

<i>Subject</i>	<i>Predicate</i>	<i>Direct Object</i>	<i>Prepositional Phrase</i>
<b>POSEIDON</b>	<b>sends</b>	<b>A SEA MONSTER</b>	<b>to ETHIOPIA</b>

<i>Prepositional Phrase</i>	<i>Purpose Clause</i>	<i>Genitive Absolute</i>	
<b>against ANDROMEDA</b>	<b>to punish CASSIOPEIA</b>	<b>at the instigation of THE NEREIDS</b>	<b>(2.4.3)</b>

<i>Subject</i>	<i>Predicate</i>	<i>Direct Object</i>	<i>Indirect Object</i>
<b>HERMES</b>	<b>sells as slave</b>	<b>HERACLES</b>	<b>to OMPHALE</b>

<i>Genitive Absolute</i>	<i>Genitive Absolute</i>		
<b>in accordance with a prophecy from APOLLO</b>	<b>In accordance with a prophecy about IPHITOS and EURYTOS</b>	<b>(2.6.3)</b>	

<i>Subject</i>	<i>Predicate</i>	<i>Direct Object</i>	<i>Prepositional Phrase</i>
<b>DEIANEIRA</b>	<b>kills</b>	<b>HERACLES</b>	<b>at MOUNT OITA</b>
<i>Prepositional Phrase</i>	<i>Purpose Clause</i>	<i>Genitive Absolute</i>	
<b>using THE 'LOVE POTION' OF NESSOS</b>	<b>to thwart IOLE</b>	<b>with the involvement of POIAS and LICHAS</b>	<b>(2.7.7)</b>

Figure 2: Examples of Ties in MANTO. Entities are in caps. (graphic: G. Goodwin)

You will see that the ties differ widely in form: some are very brief, others are highly complex. All ties must adhere to the same grammatically-standardized structure so that our data will be machine-readable; nonetheless, this is a highly flexible system that suits the richness of mythic material and allows for a great deal of autonomy in data collection.

It is necessary to always keep in mind how these ties will later be used. Firstly, and most fundamentally, MANTO functions as an index of myth: a user who searches for Apia would be directed to Apollodoros *Library* 2.1.1; a user who searches for Heracles would be directed to (among many other passages!) Apollodoros *Library* 2.5.1. (However, because some characters like Heracles, Zeus, and Agamemnon are mentioned too often in literature, MANTO will never be a fully complete reference in this regard.)

Secondly, these ties create a relational 'map' of Greek myth since they show the networks that connect various entities. We can say that the fact that entities appear together in a tie (e.g. Therimachos, Creontiaides, Deicoon, Iolaos, Heracles and Megara in the third example in fig. 2) means that there is some kind of relationship between them. Furthermore, we can use entities who appear in more than one tie to link together seemingly disparate aspects of the mythic storyworld. So, Deianera, Omphale, and Megara never interact with each other, but exist in second-degree relationships via Heracles. From such data we will be able to determine (for example) which places were more or less prominent in the Greek mythic storyworld, which heroes interacted most or least with other heroes, how regional affiliations worked, where particular objects travelled over time, and which ancient authors were concerned with which parts of the mythic tradition. Such analyses are essentially quantitative: they are based on the number of ties that each entity has with other entities. This use of the data largely ignores the qualitative dimensions offered by the predicate and the choice of prepositions etc.

A third use of this data takes advantage of the fact that our ties actually do convey more than the mere fact of a relationship. From each predicate we can deduce other pieces of information. So, for example, the third example in fig. 2 ('THERIMACHOS and CREONTIADES and DEICOON and IOLAOS is child of HERACLES and MEGARA') automatically suggests also the following ties (called 'reversals'):

HERACLES is father of THERIMACHOS and CREONTIADES and DEICOON and IOLAOS

MEGARA is mother of THERIMACHOS and CREONTIADES and DEICOON and IOLAOS

THERIMACHOS is brother of CREONTIADES and DEICOON and IOLAOS (etc.)

NB: because gender is captured as an attribute of every agent, the gender-neutral predicates that we use to collect this information ('is child', 'is parent', 'is sibling')

are replaced with gender specific forms ('son', 'daughter' etc.) in the later phases of the project.

This tie also tells us that Therimachos, Creontides, Deicoon and Iolaos belong to the same generation, and to one generation after Heracles and Megara.

Finally, it is important to understand what MANTO will *not* be able to do. Like the index to a book, it will help the user navigate Greco-Latin literature but is not intended to replace the corpus itself. So, for example, MANTO will not capture the details of *how* a particular author tells a myth, or the intentions of the various heroes. In the final example of fig. 2, for example, it's not clear that Deianeira kills her husband Heracles without meaning to – the tie 'kills' is used of all kinds of killings from cold-blooded murder and battlefield slaughter to unintentional homicide. (Note also that our ties for the most part do not allow us to capture actions contemplated but not carried out, although the general sentiment of relationships can frequently be captured by predicates like 'helps', 'hinders', plots against' etc.)

It's also important to remember that, although they do contain some narrative data, our ties are not intended to narrate stories, but rather to capture relationships between entities. Our data will not replicate the main episodes of myth in their entirety and nor will they (for the most part) be able to show in what order an agent did certain things since our model of chronology is not granular enough. Because we do not capture actions in the storyworld which are deemed insignificant in context, the ties should not be considered a definitive and complete list of all actions said to have happened in the story world. So, MANTO will allow us to create lists of all agents who die at Troy, and all agents killed by (e.g.) Heracles or Hector because death is such a significant parts of agents' biographies that the ties 'kills' or 'dies' etc. will always be used to capture such data. Yet a list of (e.g.) all agents *wounded* by (e.g.) Heracles will not be similarly complete since, although the predicate 'wounds' exists, it would only be used if it was the most significant outcome of Heracles' interaction with another agent. In many instances, the wounding might happen just before Heracles kills these other agents (so 'kills' would be used) or some other predicate might be more suitable (e.g. 'punishes', 'mistreats', or 'blinds').

### 1.5 Linked Open Data (LOD)

It is crucial that we take advantage of the benefits of working in a digital space, especially the ability to easily link to other kinds of data and other digital projects. The fundamental way that we do this is by using LOD principles: we use existing unique resource identifiers (URNs) where these exist (e.g. for textual passages (CTS); for places (the Pleiades gazetteer)); where they do not (most notably in the disambiguation of mythical names), we will build a dataset that will be of use to others as well.