UPO
UNIVERSITÀ DEL PIEMONTE ORIENTALE

geolat
geografia per la letteratura latina
geography for latin literature

the context:
Geolat - geography for Latin literature

Geolat, now expired, has been a research project aimed at offering access <u>to the geographic knowledge contained in the classical Latin texts</u> of the digilibLT digital library

see www.digiliblt.uniupo.it

the choice

"giving access to the geographic knowledge contained in the texts"
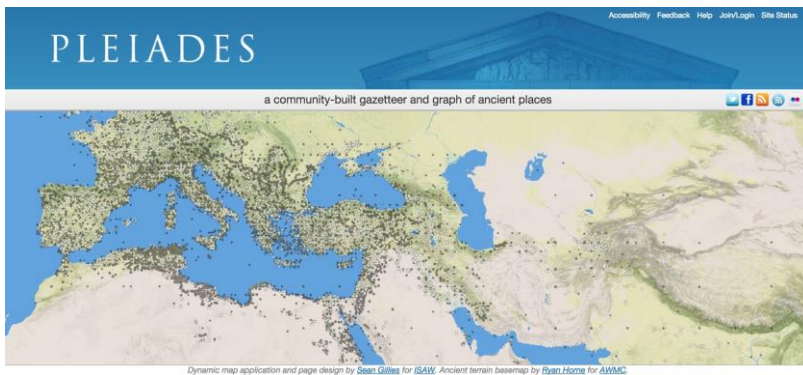
opens to two big different paths:

- parsing and Named Entities Recognition
- ontology and annotation

relevant similar projects based on parsing

Pleiades

pleiades.stoa.org


Pelagios

commons.pelagios.org

what is an ontology in computer science?

- it is a computationally tractable description of a given domain which can be accepted and reused by all information gatherers in that domain;

- it starts with conceptualizations and goes to a description of corresponding domains of objects, specifying the (most general) concepts used within different domains;

- it can be identified as a dictionary of terms formulated in a canonical syntax working as a framework for knowledge-representation for different information systems communities

what is a geographical ontology?

it is an ontology which describes geographic entities with

- their borders;
- their mereological and topological relations;
- their locations;
- their spatial representation;
- *any literary, historical, cultural characteristic*

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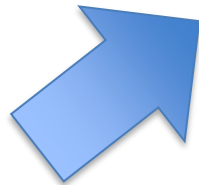
why a geographical ontology?

- the aim of such ontology is to analyze the mesoscopic world of geographical partitions in order to establish what kinds of geographical entities *exist* and how they can be *classified* in an ontological system which gather them together

- the starting point is to define what geographical entities are, on the basis of their conditions of existence, individuation and persistence, and their criteria of identity

- GO!, the geolat ontology, includes not only geographical-physical entities but also artifacts produced by human activity (roads, buildings, etc.)

geography and the Ancient World

there are three main kinds of problems to deal with when studying ancient geography, which share lack or vagueness of available data and information:

- **topological problems:** units used for the measurement of distances (time/space), exact location of places, imaginary places, etc.

- **source problems:** lack of reliability of some data, disagreement among different authors, etc.

- **methodological problems:** heterogeneity of aims, points of view, interpretations and perspectives, etc.

some specific problems of the Ancient World geographical knowledge

- placenames like *insulae cassiterides:* that is names we are not sure to which place they exactly refer
- placenames like *Avernus* which clearly are not what they are pretended to be (the entry of lower world)
- placenames related to the real (?) site of *Ades sedes,* which point to more than 1 place
- places for which we have not a name but where something happened or existed
- same entity in 2 different places: Berenikes city which was rebuilt after marriage of the queen with Ptolemy king
- same name for 2 different entities in 2 different places: ancient and modern Pompei

evolution in time is proper of geography: "big cities becoming small, and viceversa" as Herodotus says

the production of GO!

to work of creating the ontology was split in four steps:

- a critical review of the contemporary geo-informatics ontologies

- the analysis of Latin literature texts

- the study of the differences between ancient and contemporary geography

- a reunification of these information in a geo-informatics ontology for Latin literature

some features of GO!

GPS coordinates of the places; and actual names if any

historical events description

evolution of a given place (e.g. from village to city)

physical and geopolitical description of a given place

connection with places data in Pleiades

management of imaginary places

connection with the Barrington Atlas

connection with the Open Annotation ontology to cite the passages

aims of GO!

- accessibility, both for the scientific community and for general public

- informativeness

- completeness

- reusability/interoperability

reuse and interoperability of GO!

reuse:

- the ontology is made of 4 different modules which can be used alone

- there are horizontal modules collecting shared features (TOP) and vertical modules which go into detail of a given subdomain (HUM, PHY, FAR)

interoperability:

- GeoSPARQL, which is an OGC (Open Geospatial Consortium) standard is imported and reused

- the mapping with some of the most relevant geographical ontologies (or containing a relevant geographical part) is declared

GO! sources are available online

- https://w3id.org/geolit/ontologies/GO-TOP.owl
  https://w3id.org/geolit/ontologies/GO-PHY.owl
  https://w3id.org/geolit/ontologies/GO-HUM.owl
  https://w3id.org/geolit/ontologies/GO-FAR.owl

- to see a global view:

- http://visualdataweb.de/webvowl/#iri=https://w3id.org/geolit/ontologies/GO-TOP
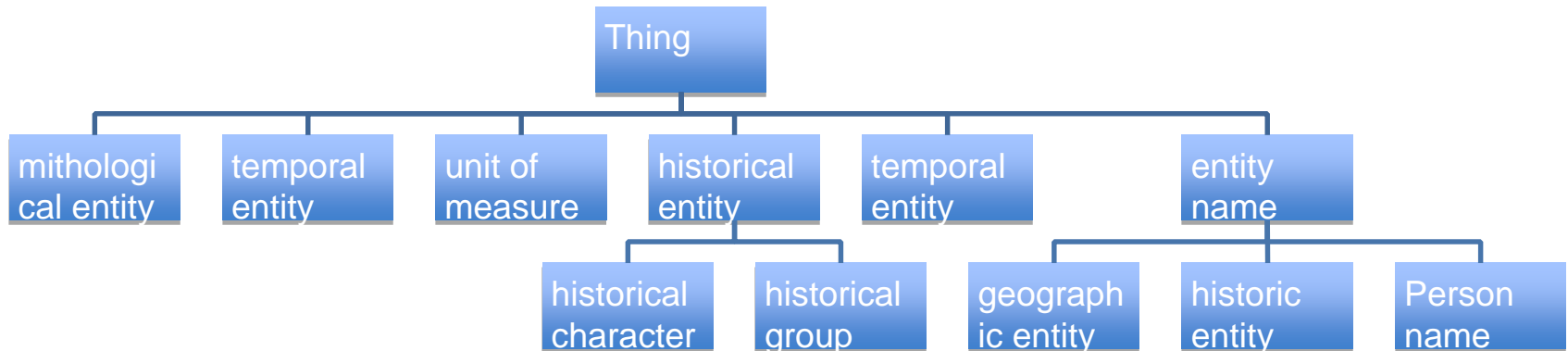
GO-TOP

contains the most general classes and properties, which would be repeated in all the other modules

main imported ontologies: Geosparql

some classes of GO-TOP
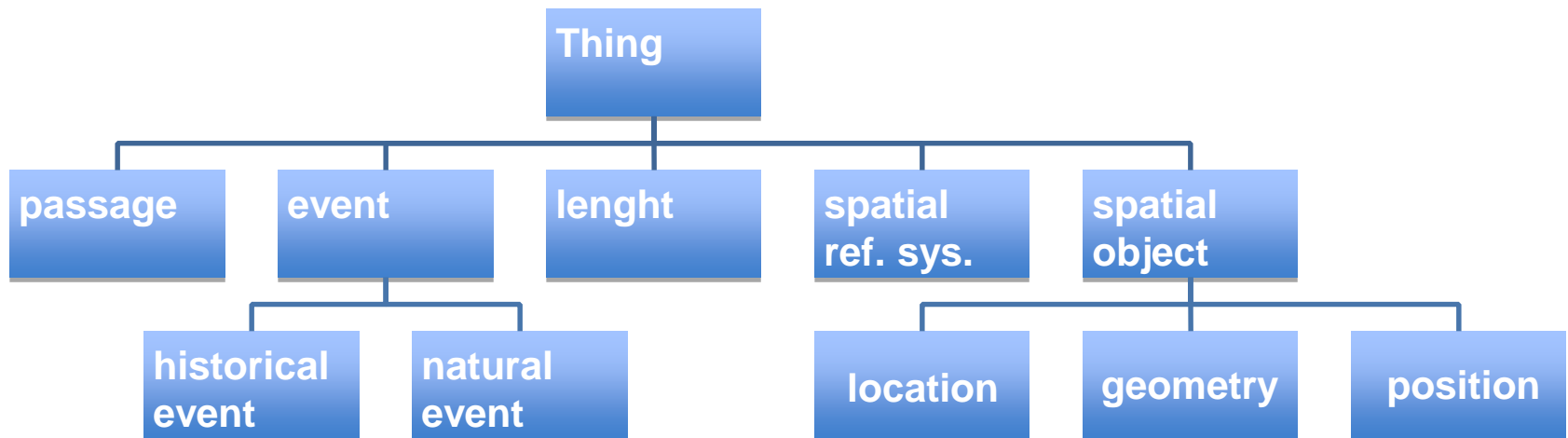
some classes of GO-TOP

relations between objects: Object Properties defined in GO-TOP

about space: above, below, borderToTheEast, borderToTheNorth, borderToTheSouth, borderToTheWest, hasLocation, hasRealPlace, hasSRID, identify, inPlace, inSRID, isUnder, leftOf, nearby, rightOf, visibleFrom, beginningPlace, endingPlace, partOf

about time: after, before, occurIn

about names: deriveFrom (describes the dependency of the meaning of a givenname from another name or entity), hasNAme, nameOf

about actors: becomes, wins, composedBy (describes by which people/parties an alliance is made), owns, foughtBetween (connects a battle or a war to the involved coalitions), hasPath, hasStopOver (allows to split a route into steps), involves, isStopOverOf (indica una tappa di un percorso), objectOf, subjectOf (these properties allow to describe events happening in given places), to, by, passesThrough, controls, belongsTo

about measurement: hasLength; measuredBy (connects a lenght to a measure unit)

assigning data values to objects: Data Properties defined in GO-TOP

about space: latitude, longitude

about time: beginningPeriod, temporalPeriod, endingPeriod, inDate, validSince, validUntil (queste ultime due proprietà servono a legare un'entità geografica antropica, spesso a carattere istituzionale e convenzionale ad una data o un periodo in cui tale istituzione/convenzione è valida)

about names: etymology (connects to the name of an entity its etymology), name (generic property which can be connected to any class and which can contain any value)
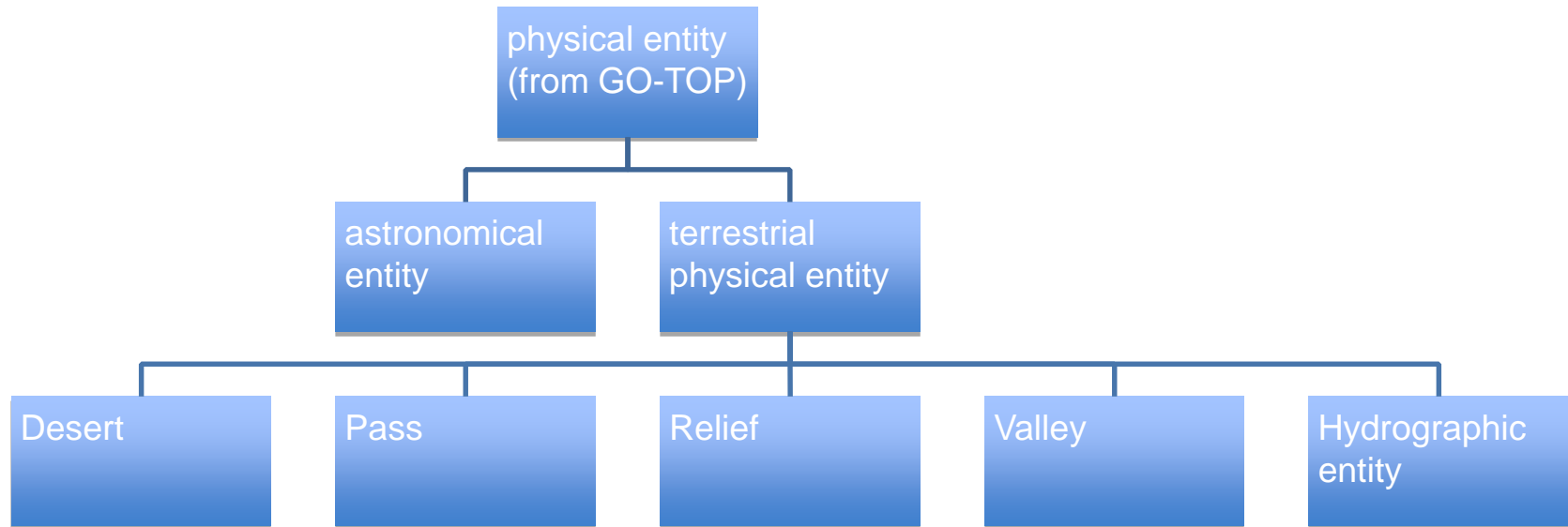
about measurement: hasValue (gives a numeric value to an entity of the class "lenght")

GO-PHY

includes a taxonomy of geographic entities that can be found in nature

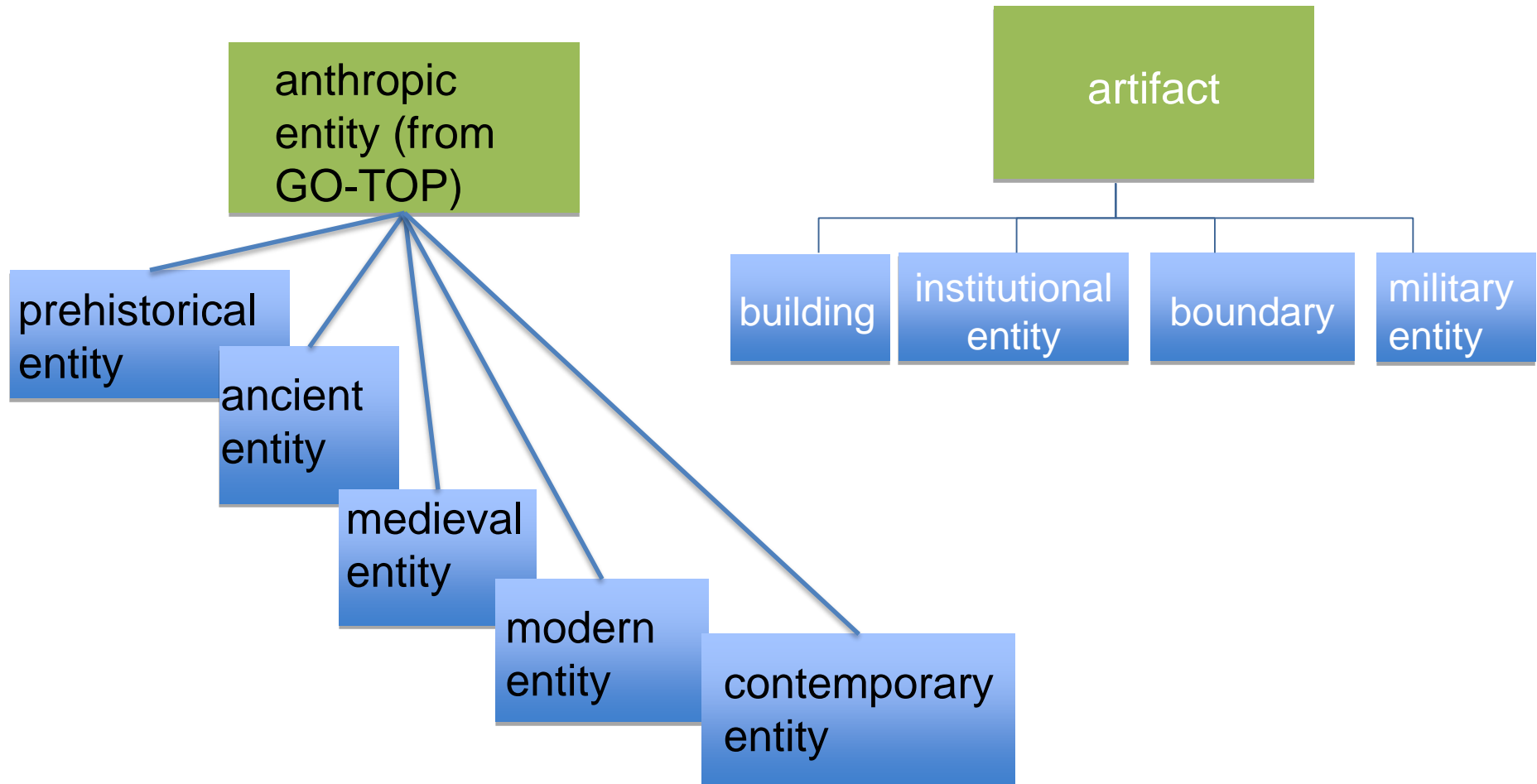main imported ontologies: GO-TOP, Geosparql

some classes of GO-PHY

GO-HUM

includes a taxonomy of geographic features produced by human beings

main imported ontologies: GO-TOP, Geosparql

some classes of GO-HUM

anthropic entity (from GO-TOP)

prehistorical entity

ancient entity

medieval entity

modern entity

contemporary entity

artifact

building

institutional entity
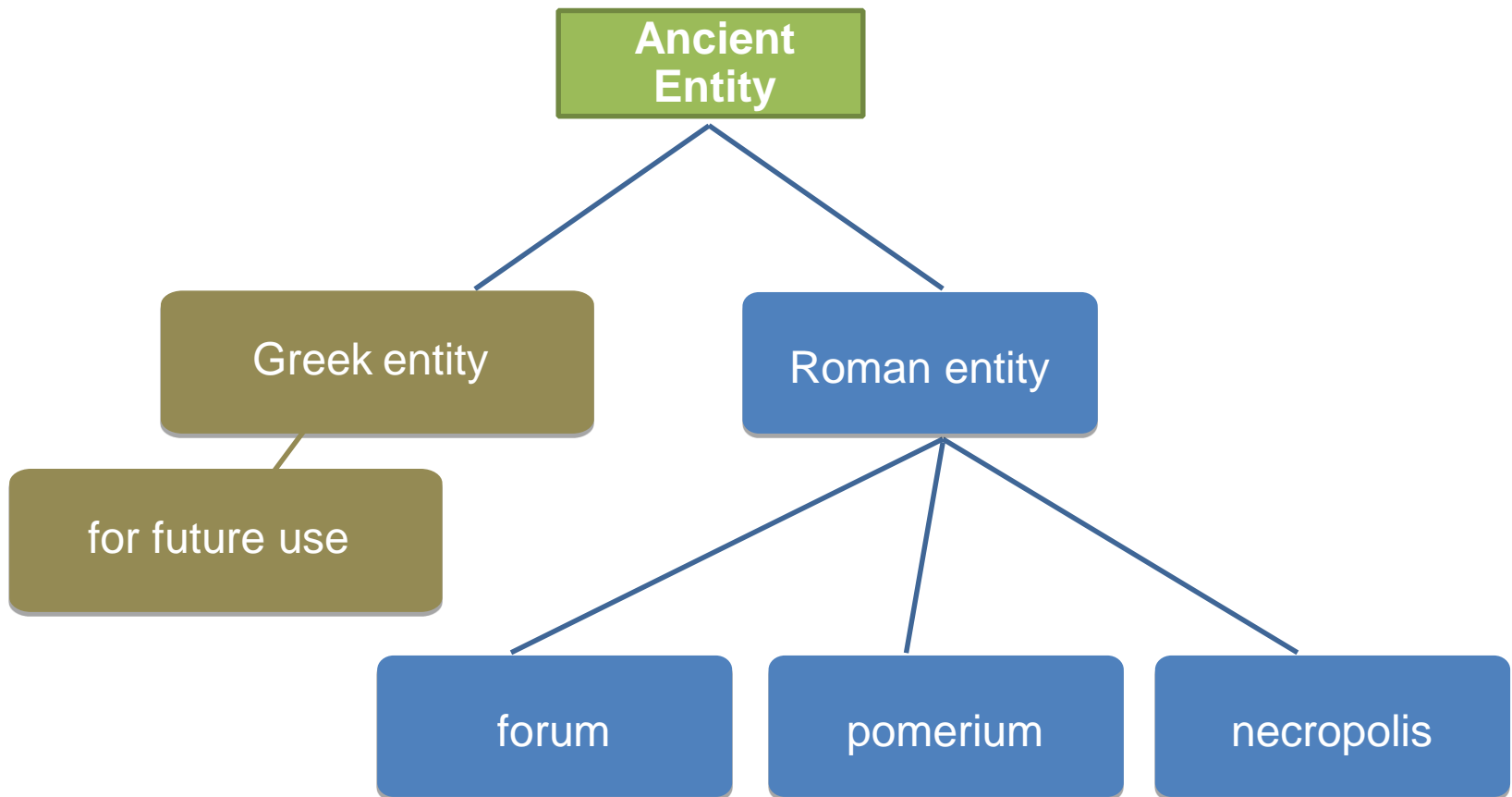
boundary

military entity

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GO-FAR

describes geographic features produced by humans during ancient times, especially by ancient Romans

main imported ontologies: GO-TOP, Geosparql

why using ontologies ?

describing (aspects of) the content of a text using the categories (the classes) of an ontology allows
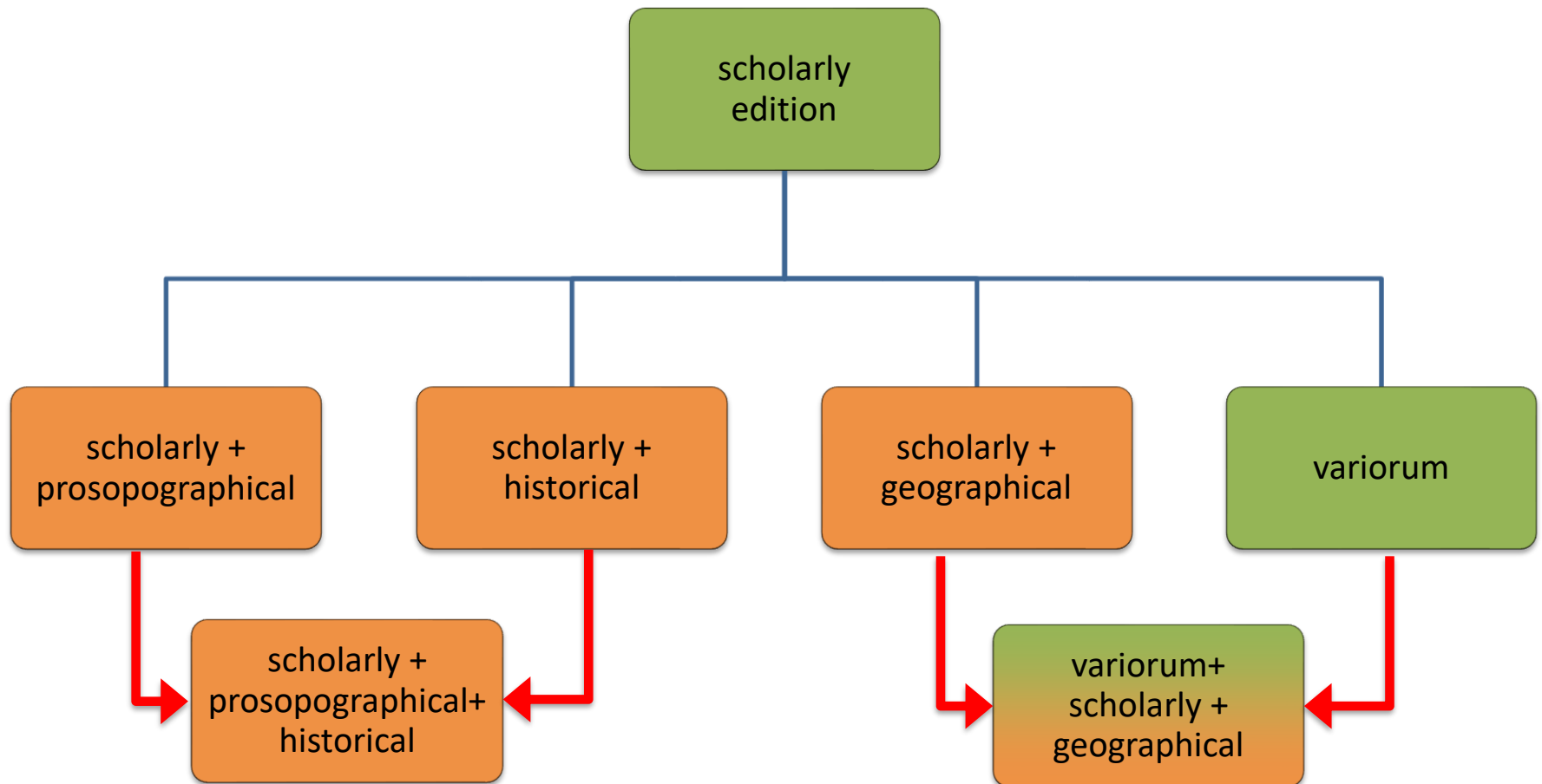
- to act *in the text* as interpreters (writing the annotation itself)

- to do searches based on some type of mixed reasoning ("which are the fresh waters occurring in the works of Augustan writers?")

- to build factual connections among different texts – so putting them in relation beyond times (which places of Roman Antiquity are mentioned in French Renaissance texts?)

why using ontologies ?

in other words the adoption of ontologies in the study of texts, among others,

- helps DH to go from doing usual things with new tools, to fully taking profit of the digital world envisaging new types of research otherwise impossible

- fully involves DHrs in the evolution of the digital world – the semantic web is an ontology-based web

- facilitates the access to the classical world by people not classics-aware – we don't want the "classical culture" to become (yet more) marginal in the digital world

a possible outcome:
new types of digital editions of texts

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mock-up of
scholarly geographical edition

1 Se quoque, cum transiret mare, non Ciliciam aut Lydiam—quippe tanti belli exiguam hanc esse mercedem—sed Persepolim, caput regni eius, Bactra deinde et Alexandria ultimique Orientis oram imperio destinasse. Quocumque ille fugere potuisset, ipsum sequi posse: desineret terrere fluminibus, quem sciret maria transisse.

5 Reges quidem haec invicem scripserant. Sed Rhodii urbem suam portusque dedebant Alexandro. Ille Ciliciam Socrati tradiderat, Philota regioni circa Tyrum iusso praesidere. Syriam, quae Coele appellatur, Andromacho Parmenio tradiderat bello, quod supererat, interfuturus.

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1 Ciliciam: [http://www.geonames.org/8378491/cilicia.html]
  Lydiam: [http://www.trismegistos.org/place/1269]
2 Persepolim: [https://pleiades.stoa.org/places/922695 | https://vici.org/vici/20445/ | http://gazetteer.dainst.org/place/2043479]
  Bactra: [https://pleiades.stoa.org/places/961886] also known as Zaraspadum and Zariaspa
  Alexandria: Alexandria MSA [Alexandria of Egypt http://pleiades.stoa.org/places/72707 | Alexandria Eschate http://pleiades.stoa.org/places/59672], Alalia MSB [https://pleiades.stoa.org/places/472048]
5 Rhodii: inhabitants of Rhodos [https://pleiades.stoa.org/places/590030]
6 Ciliciam: see l.1
  Tyrum: Tyrum MSB[http://pleiades.stoa.org/places/609564], Tyraion MSC [https://pleiades.stoa.org/places/609564 | http://dare.ht.lu.se/places/21528]
  Syriam ... Coele: [https://pleiades.stoa.org/places/991407 | http://www.geonames.org/8378530/syria-coele.html]

mock-up of
ontologically annotated passage

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1 Se quoque, cum transiret mare, non Ciliciam aut <geogName ref=https://w3id.org/
  geolit/ontologies/GO-PHY 'Lydia' xml:id='Lydia'>Lydiam</geogName> —
  quippe tanti belli exiguam hanc esse mercedem—sed Persepolim, caput regni eius, Bactra deinde
  et Alexandria ultimique Orientis oram imperio destinasse. Quocumque ille fugere potuisset,
  ipsum sequi posse: desineret terrere  fluminibus, quem sciret maria transisse.
```

Thank you!