

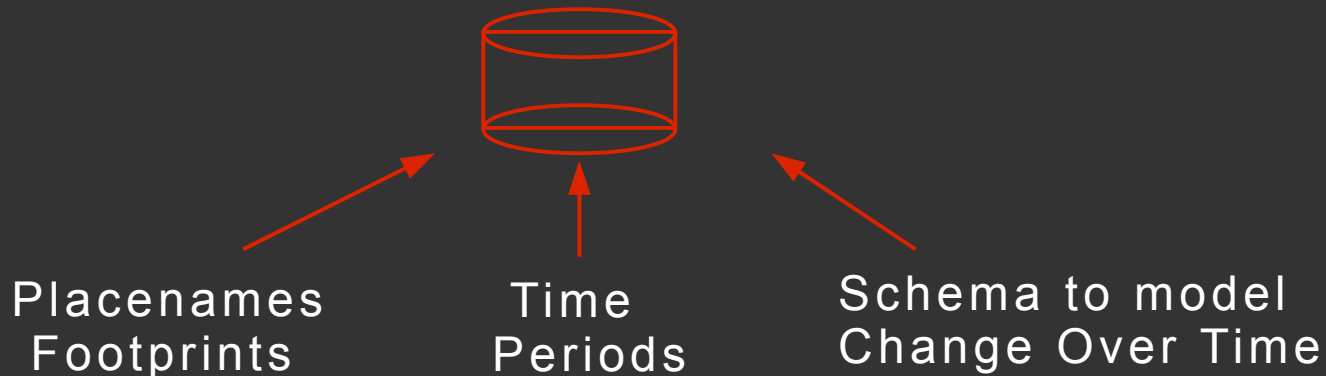
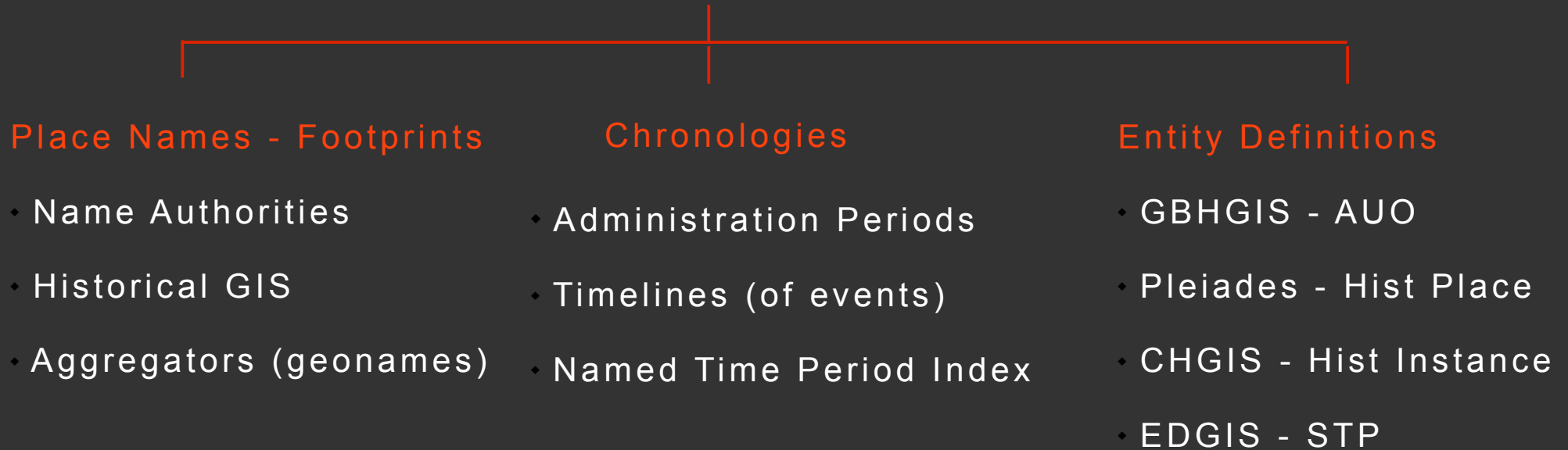
# **Historical Gazetteer Elements: Temporal Frameworks**

**Symposium on Space-Time Integration  
in Geography and GIScience**

**Lex Berman  
CGA, Harvard University**

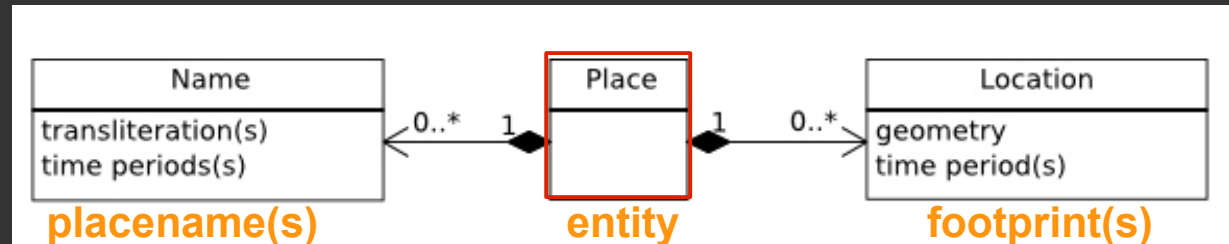
# Extending Gazetteers with Time and Entity Relationships

## Next Generation Gazetteer

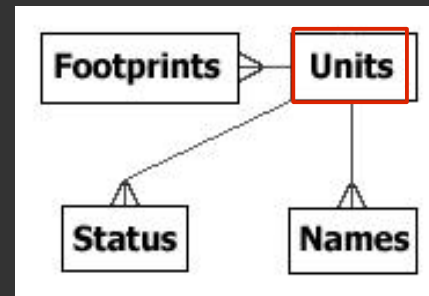


# Generic Gazetteer Entity Model

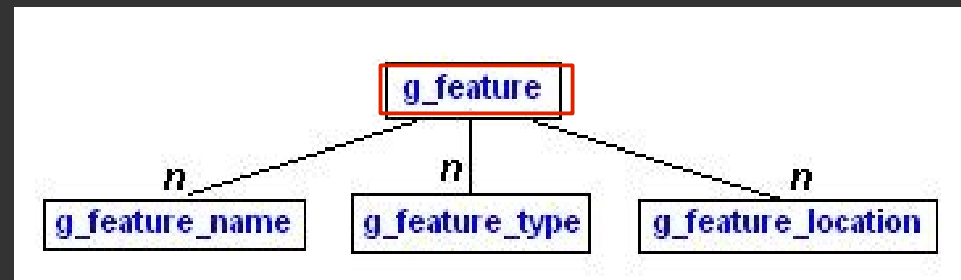
Gillies - Pleiades



Southall - GBHGIS - AUO



Hill - ADL



## Date Element Example: ADL

Alexandria Digital Library (ADL)

required: **status** (current, former, proposed)

optional: **dates** (begin and end dates), **date descriptions** (time periods, etc)

application:   to feature  
                  to placename  
                  to spatial location  
                  to classifications  
                  to relationships between places  
                  to data associated with a place

allows for:   linking to external shema for named time periods

ADL notes: “there doesn’t seem to be an external standard for the representation of time that covers the needs of the gazetteer.”

# Date Element Examples: GBHGIS

## Great Britain Historical GIS - Administrative Unit Ontology

required: **date object** (for source reference)

optional: **date object** (begin and end dates of status, name, footprint)

### Application:

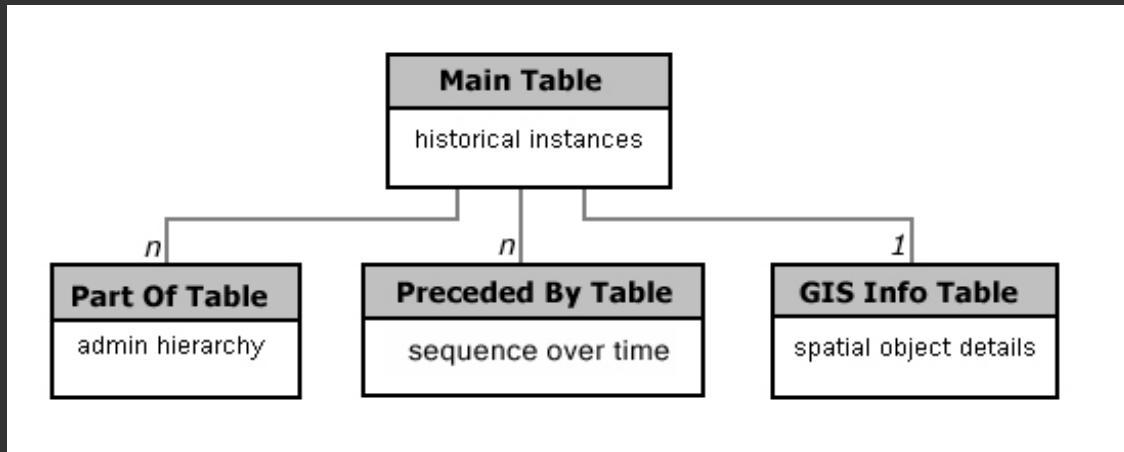
**status** (indicator of administrative unit status)

**name** (allows for multiple spellings, or changes of name)

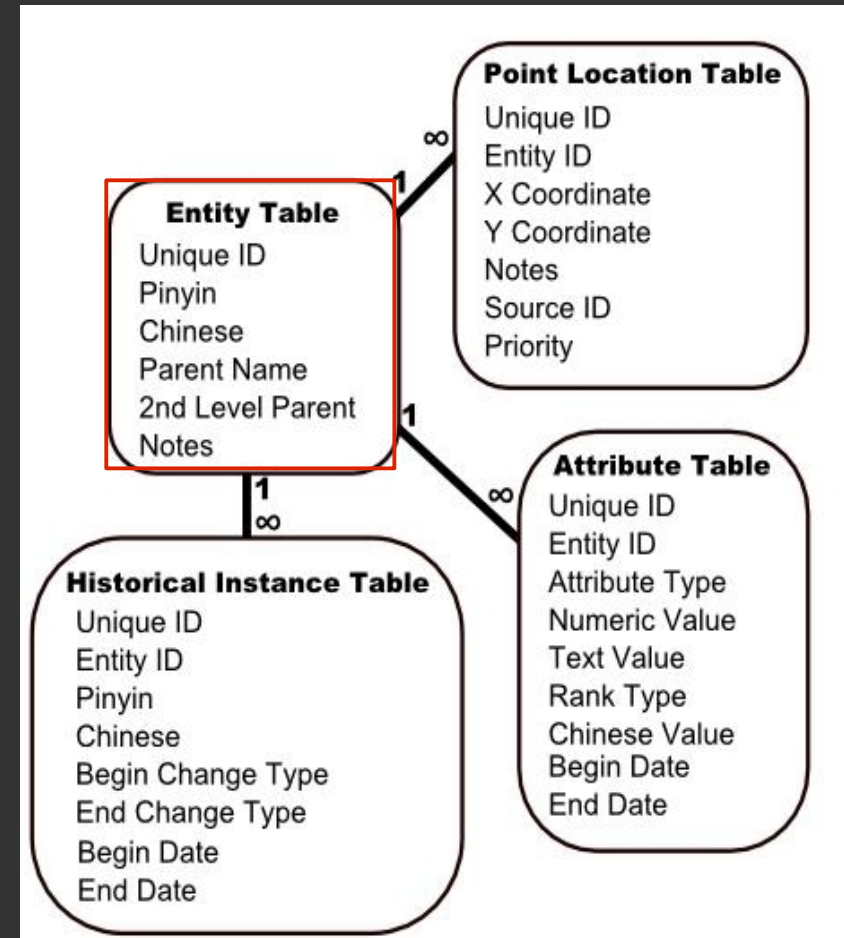
**footprint** (allows for multiple attestations about locations, or changing footprints)

# Gazetteer Entity Model - Other Cases

## CHGIS



## Mostern & Meeks - Song Gaz



# Date Element Examples: CHGIS

China Historical GIS

required: **begin\_date, end\_date** (for each instance and each relationship)

Application:

**instances** (unique for any change of Placename, Status, Footprint)  
**part-of relationships** (indicating administrative parents)

Related chronology:

**reign periods** (lookup table based on calendar year)

API: **chgis.hmdc.harvard.edu/xml/**  
          **placename/**  
          **id/**  
**chgis.hmdc.harvard.edu/xml/query/**  
          **placename/year/**

*<http://chgis.hmdc.harvard.edu/xml/query/lanzhou/1820>*

# CHGIS - Sample Webservice Result

```
<item id="9536">
  <placename>
    <name_romanized>Lanzhou Fu</name_romanized>
    <name_vernacular> 兰州府 </name_vernacular>
    <name_alternate> 蘭州府 </name_alternate>
  </placename>
  <feature_type>
    <type_english>prefecture</type_english>
    <type_romanized>Fu</type_romanized>
    <type_vernacular> 府 </type_vernacular>
    <type_id>84</type_id>
  </feature_type>
  <temporal>
    <begin_year>1820</begin_year>
    <begin_year_rule>9</begin_year_rule>
    <end_year>1820</end_year>
    <end_year_rule>9</end_year_rule>
  </temporal>
  <spatial>
    <object_type>point</object_type>
    <coordinate_type>point location</coordinate_type>
    <degrees_latitude>36.047031</degrees_latitude>
    <latitude_direction>N</latitude_direction>
    <degrees_longitude>103.847137</degrees_longitude>
    <longitude_direction>E</longitude_direction>
    <present_location> 甘肃兰州市 </present_location>
  </spatial>
  <evidenced_by>
    <source_note>
      <note_type>administrative seat</note_type>
      <note_id>25000</note_id>
    </source_note>
  </evidenced_by>
  <links>
    <webpage source="CHGIS">http://chgis.hmdc.harvard.edu/query_details.php?ptid=9536</webpage>
    <webpage source="google_map">http://maps.google.com/maps?q=36.047031,103.847137(lanzhou)&amp;spn=0.1,0.1&amp;t=m&amp;hl=e&amp;z=9</webpage>
  </links>
</item>
```



## Geo-parsing

associating references (Place Names) with geospatial footprints

leveraging gazetteers **works**:

gazetteer elements: name, classification, footprint

# Geo-parsing Example: Geonames

Jan 2011 - 25 milion requests per day (50% Smartphones)

API: [api.geonames.org/search?](http://api.geonames.org/search?)

[api.geonames.org/search?name=placitas&maxRows=10&username=demo](http://api.geonames.org/search?name=placitas&maxRows=10&username=demo)

- q
- name
- name\_equals
- name\_startsWith
- maxRows
- startRow
- country
- countryBias
- continentCode
- adminCode1, adminCode2, adminCode3
- featureClass
- featureCode
- lang
- type (xml,json,rdf)
- style
- isNameRequired
- tag
- operator
- charset
- fuzzy

# Gazetteer Entity Model - Geonames

<b>geoname</b>
geonameid int, name varchar(200), asciiname varchar(200), alternatenames varchar(6000), latitude float, longitude float, fclass char(1), fcode varchar(10), country varchar(2), cc2 varchar(60), admin1 varchar(20), admin2 varchar(80), admin3 varchar(20), admin4 varchar(20), population bigint, elevation int, gtopo30 int, timezone varchar(40), moddate date

<b>alternate name</b>
alternatenameid int, geonameid int, isoLanguage varchar(7), alternateName varchar(300), isPreferredName boolean, isShortName boolean

**iso\_languagecodes**

**featureCodes**

**adminCodes**

**timeZones**

**continentCodes**

**postalCodes**



# Extending Geonames With Dates

## **geoname**

geonameid int,  
name varchar(200),  
asciiname varchar(200),  
alternatenames varchar(6000),  
latitude float,  
longitude float,  
fclass char(1),  
fcode varchar(10),  
country varchar(2),  
cc2 varchar(60),  
admin1 varchar(20),  
admin2 varchar(80),  
admin3 varchar(20),  
admin4 varchar(20),  
population bigint,  
elevation int,  
gtopo30 int,  
timezone varchar(40),  
moddate date

## **alternate name**

alternatenameid int,  
geonameid int,  
isoLanguage varchar(7),  
alternateName varchar(300),  
isPreferredName boolean,  
isShortName boolean,  
isHistoricalName boolean,  
existDate date,  
endDate date,  
srcCiteName varchar(300),  
srcCiteLink varchar(300)

## Geo-parsing

associating references (Place Names) with geospatial footprints

leveraging gazetteers **works**:

gazetteer elements: name, classification, footprint

## GeoTemporal-parsing

associating references (Place Names, events) with temporal footprints

leveraging gazetteers **doesn't work**:

gazetteer elements: dates are optional or entirely missing

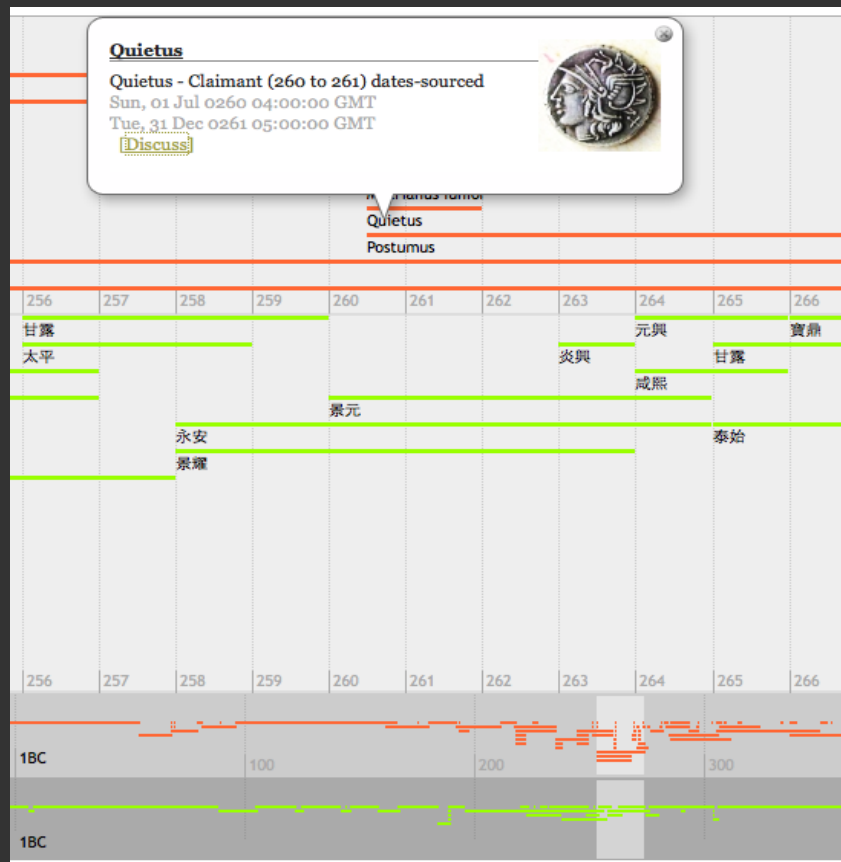
# Time Periods Authority to merge Chronologies?

examples:

**Named Time Period Directory** (Petras, Larson, Buckland)

**Dharma Drum Time Authority** (Bingeheimer, Wiles)

**Common Eras** (Erikson, et al)



## Temporal Browse < - > Spatial Browse

**Roman Empire Chronology** [-0753] to [1453]

-- **United Roman Empire** [-0027] to [0395]

---- **Caligula** [0041] to [0054]

**United Roman Empire**

-- **Thracia**

---- **Hadrianopolis**

Ideally working from either point of entry

## **Linked Data - geo / chrono**

**moving toward ontologies of spatial features  
stored as triples (RDF), or deliverable via APIs**

**lacking in ontologies of temporal features (named  
time periods)**

**how will the spatial and temporal instances  
interact?**

**if you were to develop your own schema for  
handling the temporal element, how would do it?**



## Publication – Resources

<http://fas.harvard.edu/~chgis/gazetteer>

we welcome your proposals for:

articles for a special journal

a collaborative website / wiki

ideas for building a global historical gazetteer