



HAL
open science

Temporal Knowledge Representation and Exploitation for the Henri Poincaré (1854-1912) Correspondence Corpus

Nicolas Lasolle

► **To cite this version:**

Nicolas Lasolle. Temporal Knowledge Representation and Exploitation for the Henri Poincaré (1854-1912) Correspondence Corpus. Data for History 2021: Modelling Time, Places, Agents, May 2021, Berlin (virtual conference), Germany. hal-03229491

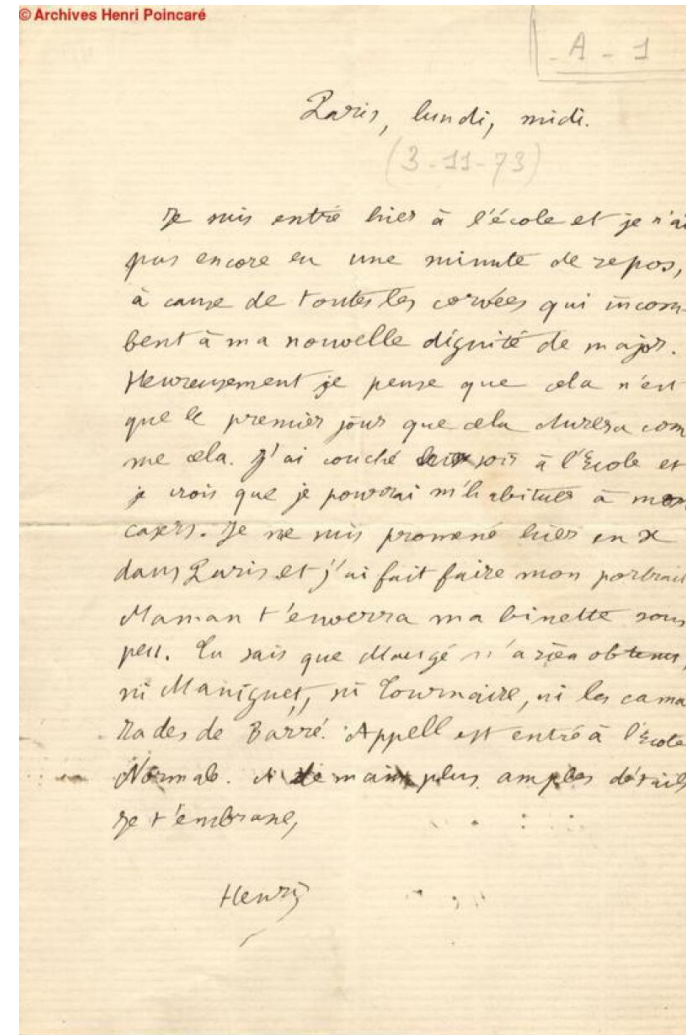
HAL Id: hal-03229491

<https://hal.science/hal-03229491v1>

Submitted on 19 May 2021

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



A historical corpus

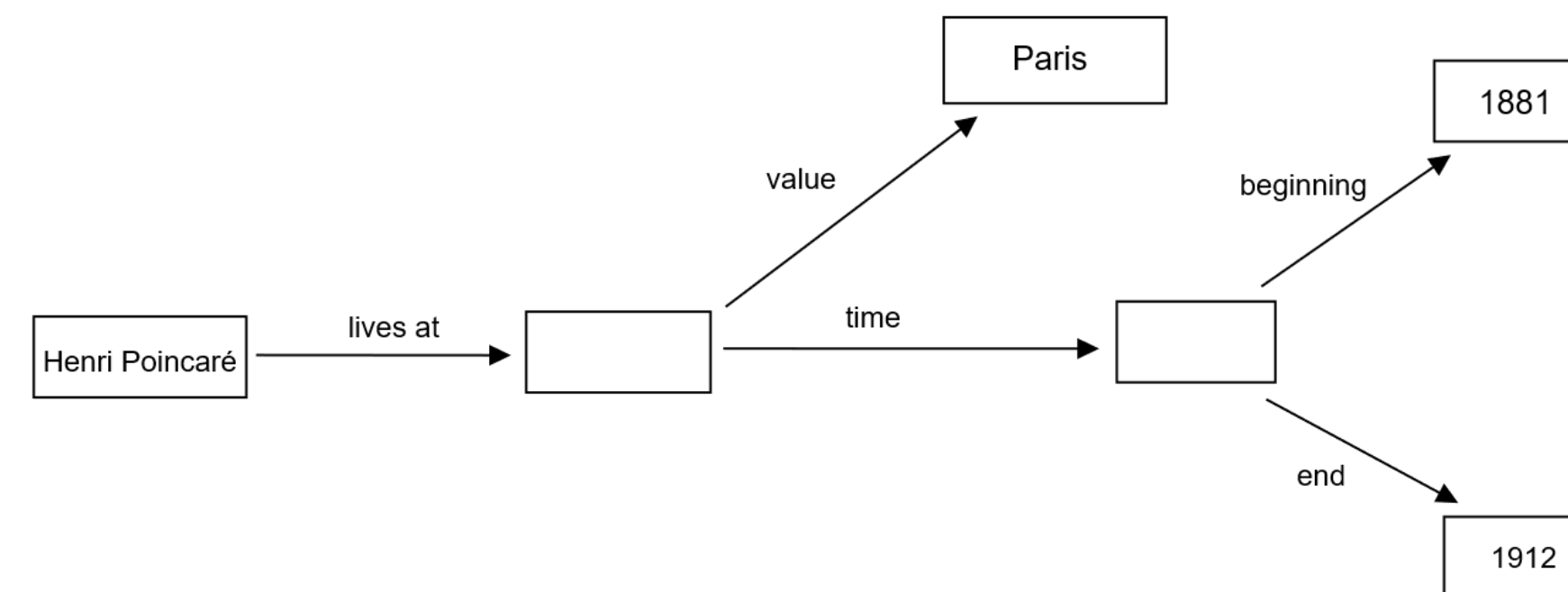
- Composed of around 2200 letters
- Important knowledge base
 - Scientific content
 - Administrations and learned societies
 - Social, political and cultural context
- Semantic Web technologies used to represent and to exploit corpus data (RDF, RDFS, SPARQL) [1]

Examples of facts that require a temporal extent

- Student at the *École polytechnique* from 1873 to 1875
- Member of the French Academy of Sciences from 1887
- Lived in Paris from 1881 to 1912
- etc.

How to add a temporal extent to facts represented using the RDF model? How to exploit this newly formed knowledge?

A model based on n-ary representations [2]

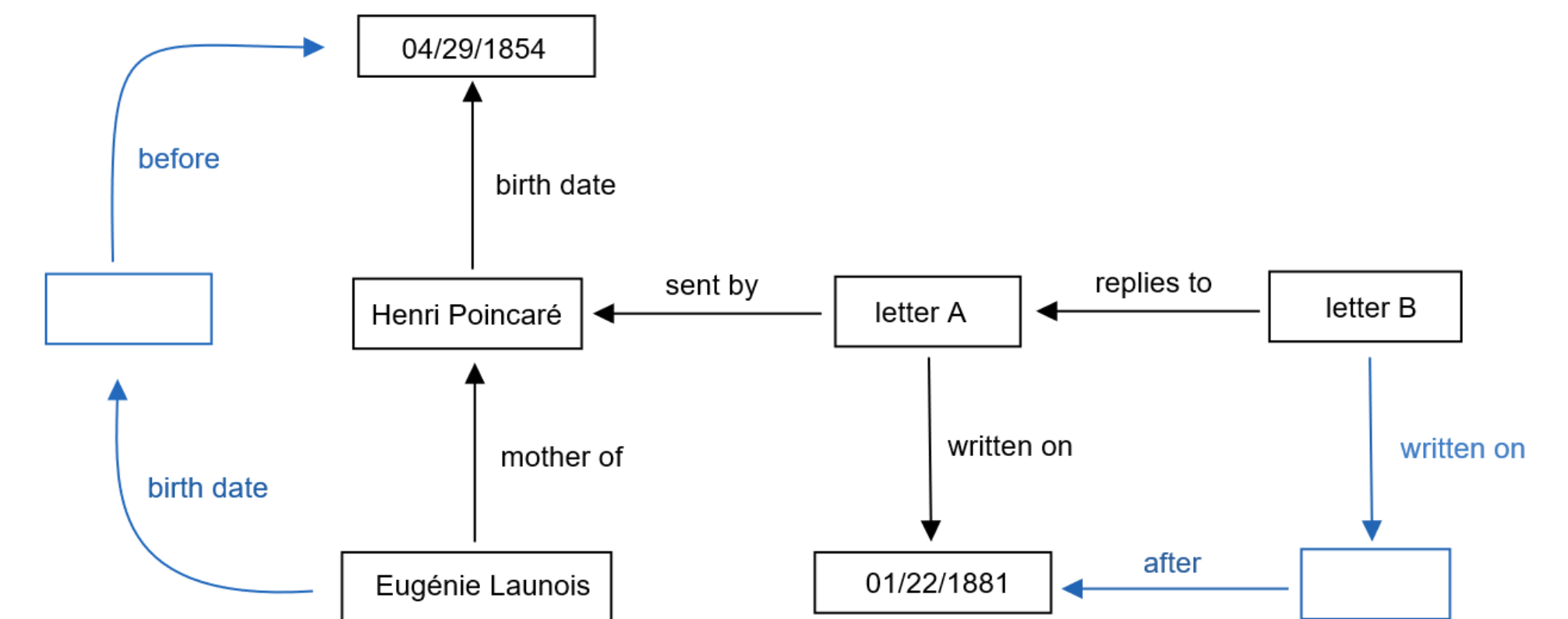


OWL-Time ontology and reasoning process

OWL-Time provides specific predicates to support, or to make explicit the results of, reasoning over the order or sequence of temporal entities [3].

A system based on custom inference rules has been set up to automatically enrich the corpus knowledge base.

Example of graph with inferred relations



References

- [1] Bruneau, O., Lasolle, N., Lieber, J., Nauer, E., Pavlova, S., & Rollet, L. (2021). Applying and Developing Semantic Web Technologies for Exploiting a Corpus in History of Science: The Case Study of the Henri Poincaré Correspondence. *Semantic Web -- Interoperability, Usability, Applicability*, 12(2), 359-378.
- [2] Noy, N., Rector, A., Hayes, P., & Welty, C. (2006). Defining n-ary relations on the semantic web. *W3C working group note*, 12(4).
- [3] Hobbs, J. R., & Pan, F. (2006). Time Ontology in OWL. *W3C working draft*, 27, 133.



Archives Henri Poincaré
Philosophie et Recherches sur les
Sciences et les Technologies

This work is supported partly by the French PIA project "Lorraine Université d'Excellence", reference ANR-15-IDEX-04-LUE.