Streamlining the Creation of Holocaust-related Digital Editions with Automatic Tools

Sarah Bénière, Floriane Chiffoleau, Hugo Scheithauer

Streamlining the Creation of Holocaust-related Digital Editions with Automatic Tools

ALMAnaCH project-team

Inria

Sarah Bénière, Floriane Chiffoleau, Hugo Scheithauer

EHRI Academic Conference, Warsaw, Poland
June 18th, 2024

Outline of the presentation

1. The **project** and us
2. The **sources**
3. **Outline** of the semi-automated workflow
4. **Acquiring the content** of the source faster
5. **Obtaining the structure** of the document
6. **Enriching the transcriptions** semi-automatically
7. **Proposing a centralized interface** for future holocaust-related editions
8. **Conclusion**
9. **Resources**

THE PROJECT AND US

A bit of background

Who are we?

Floriane Chiffoleau

PhD Candidate in Digital Humanities (Inria, Le Mans Université).

Thesis topic: Automatic Text Recognition and Ground Truth

Hugo Scheithauer

PhD Candidate in Digital Humanities (Inria, Ecole Pratique des Hautes Etudes, Paris).

Thesis topic: Document Layout Analysis and Document Understanding

Sarah Benière

R&D Engineer in Digital Humanities (Inria).

Master's Internship on the project

THE SOURCES

What are we working with?

Six Holocaust-related online editions developed and published by the EHRI consortium:

- **Begrenzte Flucht Edition** (2018) **& Uzavřít Hranice Edition** (2023): Documents related to the crisis year 1938 at the Czechoslovakia border and Austrian refugees.
- **Early Holocaust Testimonies Edition** (2020): Testimonies in Czech, German, Hungarian, Polish, Dutch, and Yiddish.
- **Diplomatic Reports Edition** (2021): Reports from the diplomatic staff of Denmark, Italy, Japan, Hungary, Slovakia, and the United States.
- **Von Wien ins Nirgendwo - Die Nisko-Deportationen 1939 Edition** (2023): Documents on the history of the Viennese Jewish deportees to Nisko
- **Documentation Campaign Edition** (2023): Holocaust survivor testimonies

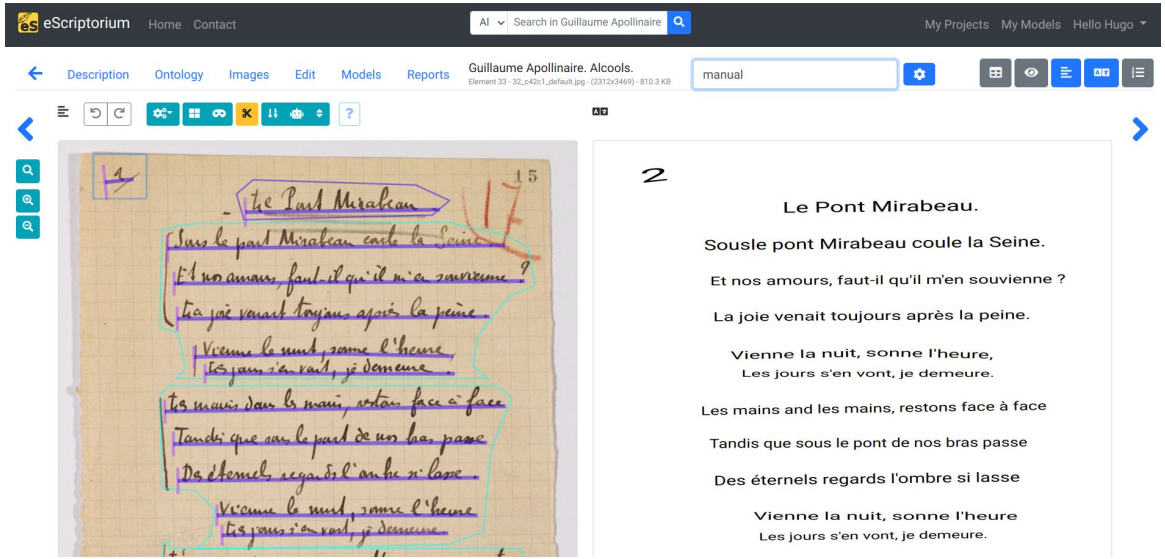
OUTLINE OF THE SEMI-AUTOMATED WORKFLOW

Semi-automated workflow

ACQUIRING THE CONTENT OF THE SOURCE FASTER

A tool for ATR: eScriptorium

- GUI for transcribing textual documents, creating training sets, training segmentation and transcription models, etc.
- Project management tool
- eScriptorium uses the language-agnostic transcription engine Kraken (Benjamin Kiessling, PSL)
- Inria hosts an eScriptorium instance. You can ask for an account with Cremma Call form (in French for now, sorry!).



Creation of a multilingual recognition model

- Two **objectives**:
  - Producing an **efficient multilingual recognition model** for typescript documents
  - Contributing to a **PhD experiment**
- Creation of **training data** for the model
  - **252 typescript documents**, **7 languages**
  - Documents **segmented and transcribed** (copy/paste or manual)
  - Images/Texts/XML: https://github.com/FloChiff/ehri-dataset
  - Presentation of the dataset: https://flochiff.github.io/phd/dataset/ehri/dataset.html

Creation of a multilingual recognition model

- Model with **97.20% of accuracy**
- **Efficiency** of the model:
  - Working pretty well with the **languages it was trained on**
  - Recognition abilities for the **languages it was not trained on** (if same Latin script)
  - Trouble with the **diacritics and uppercase**
- **Other models available**: production of single-language models for each language of the training data

EHRI automatic text recognition dataset and training results

Language	Source	Number of documents	Number of lines	ATR model accuracy
German	BeGrenzte Flucht (BF); Die Nisko-Deportationen (Nisko); Early Holocaust Testimony (EHT)	56	2287	97.9%
English	BF; EHT; Diplomatic Reports (DR)	54	1989	97.5%
Czech	BF; EHT	46	1713	96.7%
Danish	DR	36	1007	97.8%
Hungarian	EHT	30	1334	95.7%
Polish	EHT	15	468	93.1%
Slovak	BF	15	395	93.7%
Multilingual	BF; Nisko; DR; EHT	252	9193	97.2%

OBTAINING THE STRUCTURE OF THE DOCUMENT

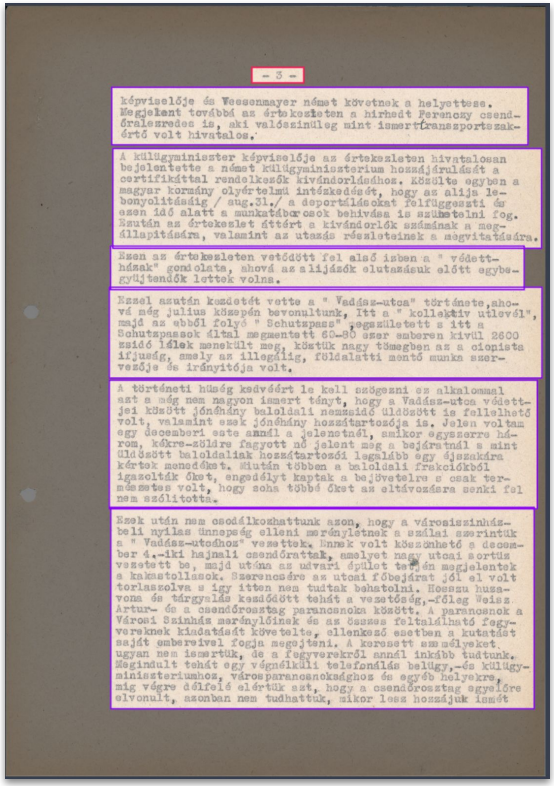
Semi-automatic encoding with layout analysis

Document Layout Analysis (DLA)

Detection of the **layout components** and their **hierarchy**

Two main approaches:

- **Visual features** (YOLOv8)
- Combination of textual and visual features (LayoutLM)

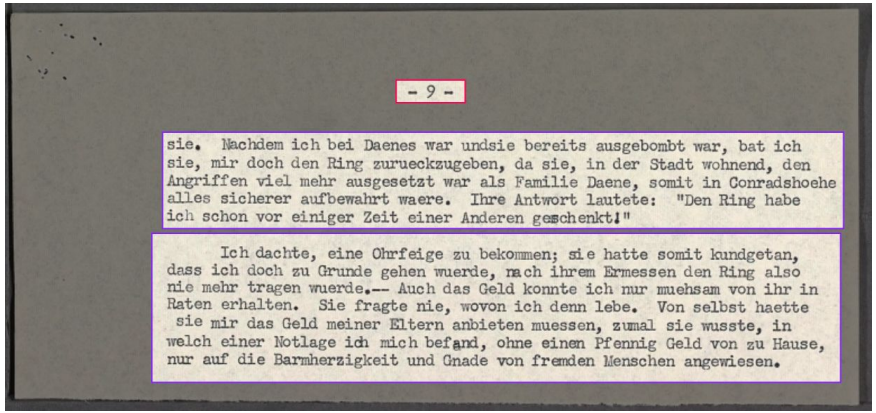


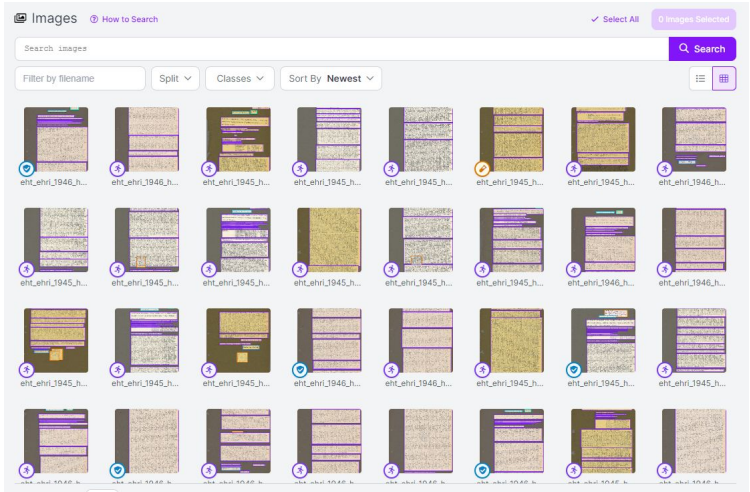
Semi-automatic encoding with layout analysis

200 images from the Early Testimonies edition

Annotated with **Roboflow** → dataset

YOLOv8 model (object detection, pixel based)

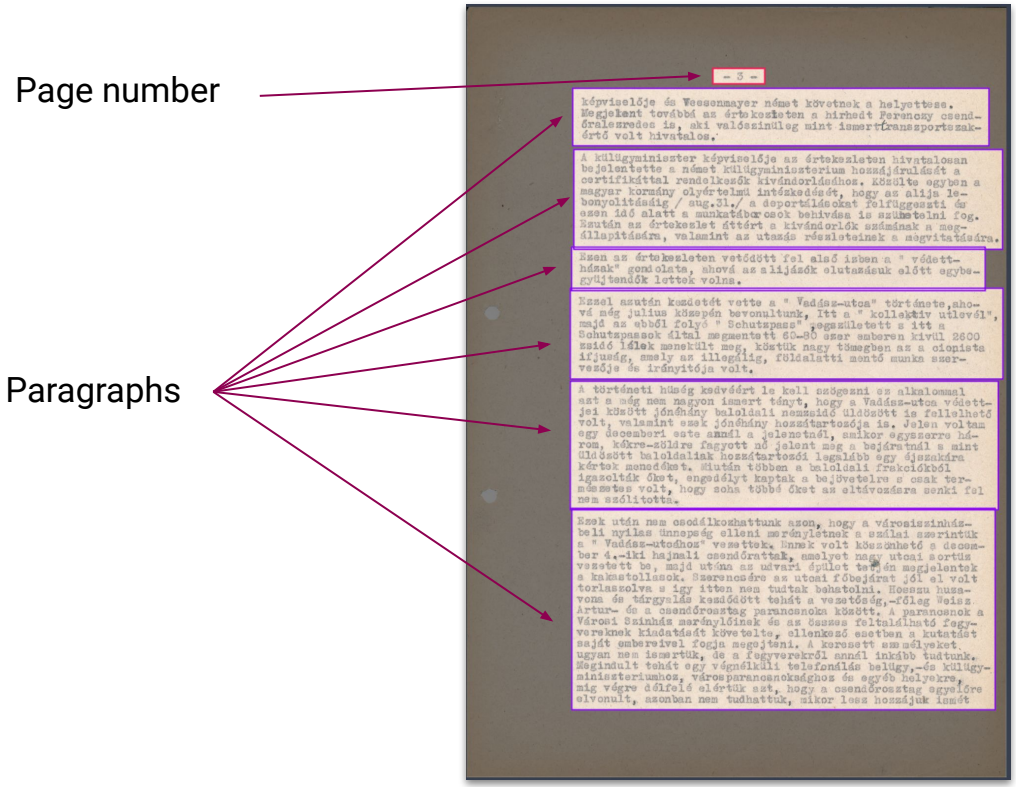




Clérice, T. (2023). You Actually Look Twice At it (YALTAi): using an object detection approach instead of region segmentation within the Kraken engine. *Journal of Data Mining & Digital Humanities, 2023*. https://doi.org/10.46298/jdmdh.9806.

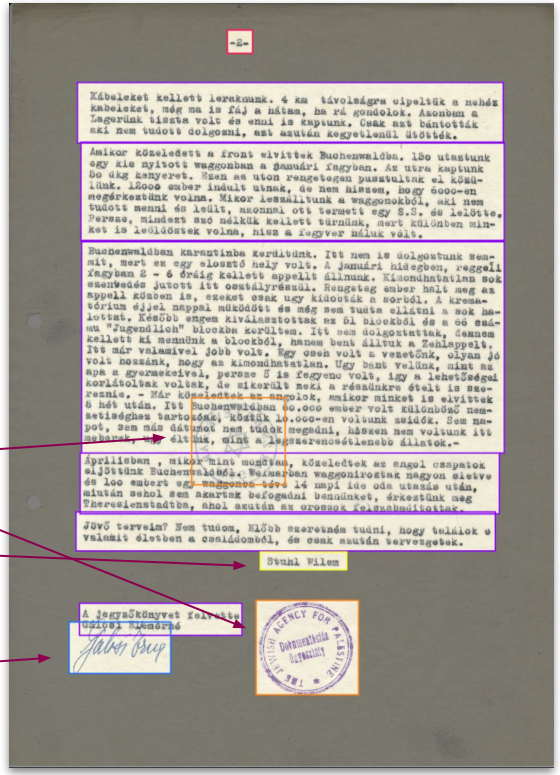
Clérice, T., Janès, J., Scheithauer, H., Bénière, S., Romary, L., & Sagot, B. (2024). *Layout Analysis Dataset with SegmOnto*. DH2024 - Annual conference of the Alliance of Digital Humanities Organizations, Washington, D.C., United States. ⟨hal-04513725⟩

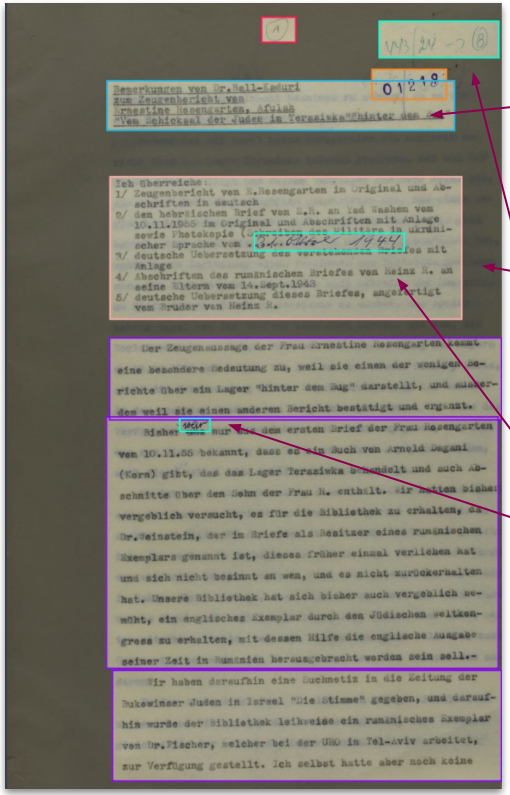
Semi-automatic encoding with layout analysis



Semi-automatic encoding with layout analysis

The range varies from very simple layout to more intricate layouts.





Stamp

Author

Handwritten signature

Semi-automatic encoding with layout analysis

Gabay, S., Pinche, A., Christensen, K., & Camps, J.-B. (2023). SegmOnto: A Controlled Vocabulary to Describe and Process Digital Facsimiles. ⟨hal-04343404⟩.

13 classes in the EHRI dataset (for now)

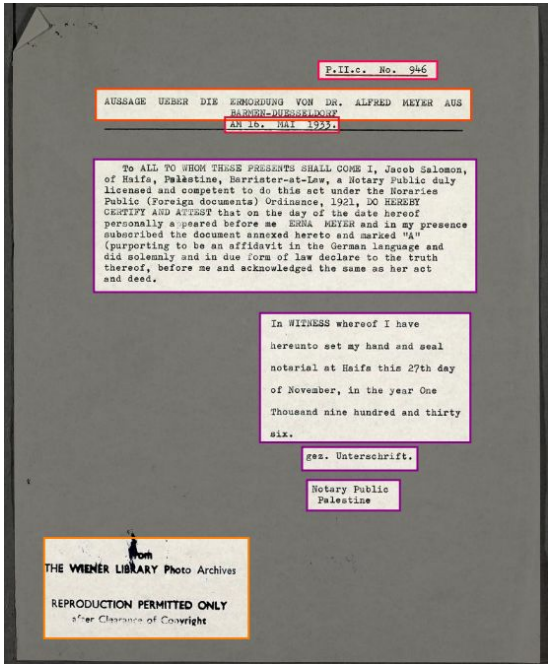
Annotations derived from the SegmOnto **controlled vocabulary**

- ↳ *Interoperable*
- ↳ *Reusable*

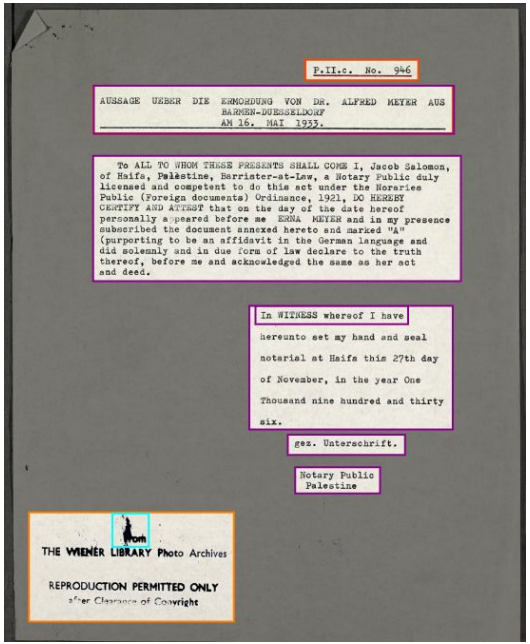
SegmOnto is **highly compatible with TEI-XML** encoding

MainZone:P
NumberingZone
MarginTextZone:ManuscriptAddendum
MainZone:Head
ManuscriptAddendum:Signature
StampZone
MainZone:Date
MainZone:Signature
StampZone:Sticker
RunningTitleZone
MainZone:List
MainZone:Form
MarginTextZone:Notes

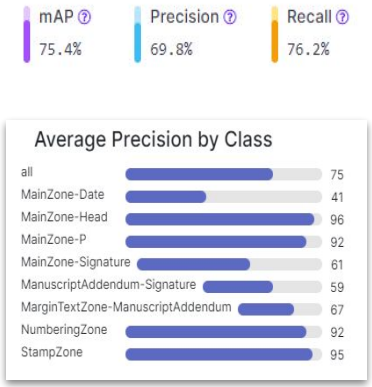
Semi-automatic encoding with layout analysis



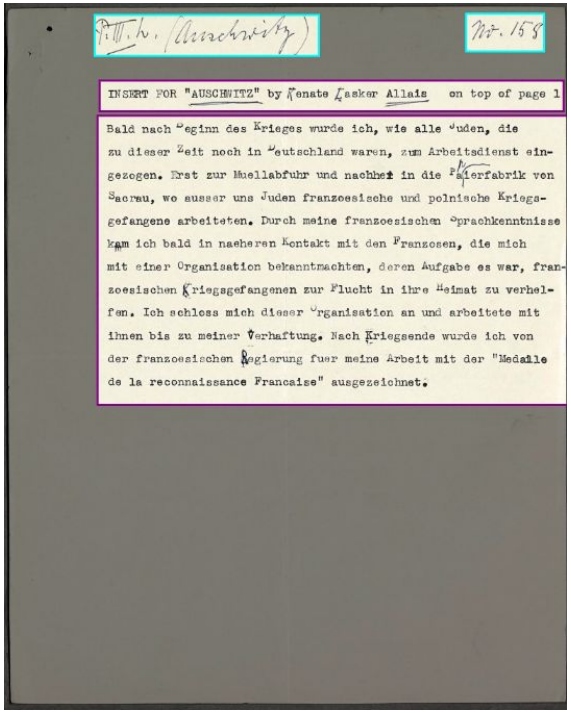
Ground truth



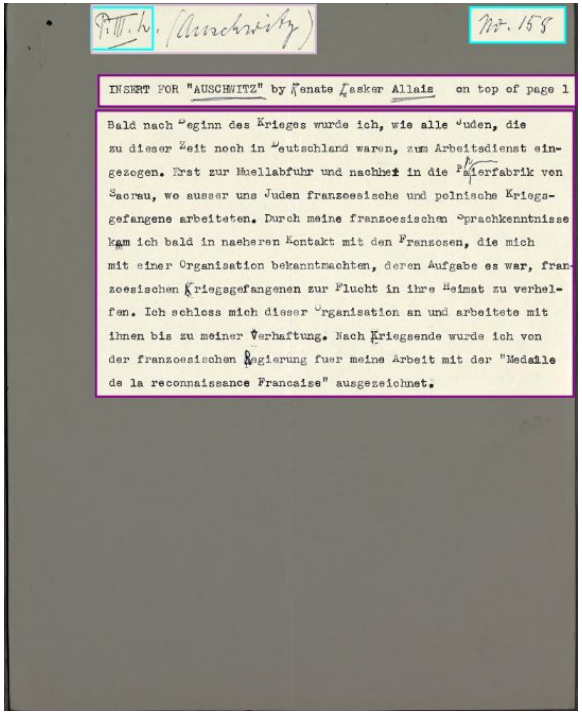
Prediction



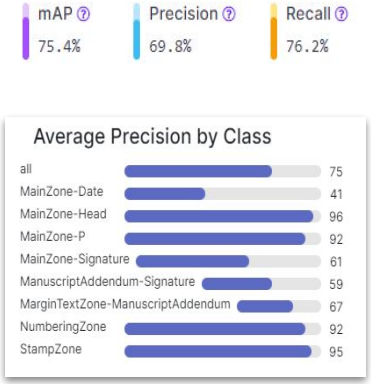
Semi-automatic encoding with layout analysis



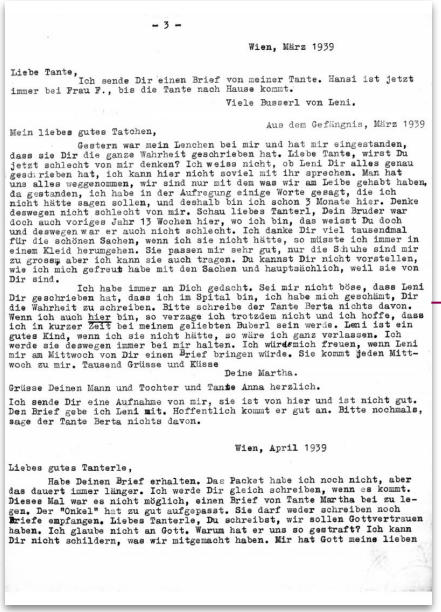
Ground truth



Prediction



Semi-automatic encoding with layout analysis



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Wien, März 1939

Liebe Tante,

Ich sende Dir einen Brief von meiner Tante. Hansi ist jetzt immer bei Frau F., bis die Tante nach Hause kommt.

Viele Busserl von Leni.

Aus den Gefängnis, März 1939

Mein liebes gutes Tatchen,

Gestern war mein Lenchen bei mir und hat mir eingestanden, dass sie Dir die ganze Wahrheit geschrieben hat. Liebe Tante, wirst Du jetzt schlecht von mir denken? Ich weiss nicht, ob Leni Dir alles genau geschrieben hat, ich kann hier nicht soviel mit ihr sprechen. Man hat uns alles weggenommen, wir sind nur mit dem was wir am Leibe gehabt haben, da gestanden, ich habe in der Aufregung einige Worte gesagt, die ich nicht hätte sagen sollen, und deshalb bin ich schon 3 Monate hier. Denke deswegen nicht schlecht von mir. Schau liebes Tanterl, Dein Bruder war doch auch voriges Jahr 13 Wochen hier, wo ich bin, das weisst Du doch und deswegen war er auch nicht schlecht. Ich danke Dir viel tausendmal für die schönen Sachen, wenn ich sie nicht hätte, so müsste ich immer in einem Kleid herumgehen. Sie passen mir sehr gut, nur die Schuhe sind mir zu gross, aber ich kann sie auch tragen. Du kannst Dir nicht vorstellen, wie ich mich gefreut habe mit den Sachen und hauptsächlich, weil sie von Dir sind.

Ich habe immer an Dich gedacht. Sei mir nicht böse, dass Leni Dir geschrieben hat, dass ich im Spital bin, ich habe mich geschämt, Dir die Wahrheit zu schreiben. Bitte schreibe der Tante Berta nichts davon. Wenn ich auch hier bin, so verzage ich trotzdem nicht und ich hoffe, dass ich in kurzer Zeit bei meinem geliebten Buberl sein werde. Leni ist ein gutes Kind, wenn ich sie nicht hätte, so wäre ich ganz verlassen. Ich werde sie deswegen immer bei mir halten. Ich würde mich freuen, wenn Leni mir am Mittwoch von Dir einen Brief bringen würde. Sie kommt jeden Mittwoch zu mir. Tausend Grüsse und Küsse

Deine Martha.

Grüsse Deinen Mann und Tochter und Tante Anna herzlich.

Ich sende Dir eine Aufnahme von mir, sie ist von hier und ist nicht gut. Den Brief gebe ich Leni mit. Hoffentlich kommt er gut an. Bitte nochmals, sage der Tante Berta nichts davon.

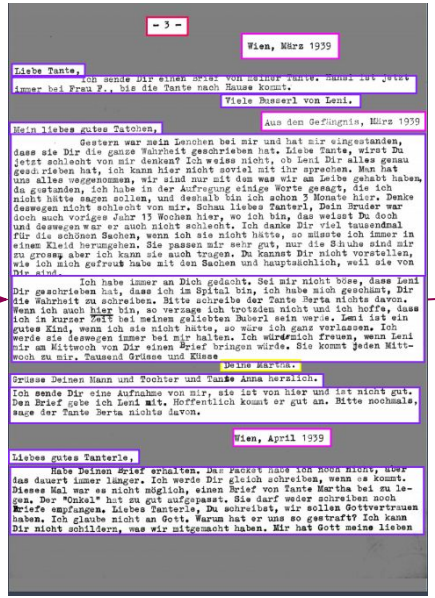
Wien, April 1939

Liebes gutes Tanterle,

Habe Deinen Brief erhalten. Das Packet habe ich noch nicht, aber das dauert immer länger. Ich werde Dir gleich schreiben, wenn es kommt. Dieses Mal war es nicht möglich, einen Brief von Tante Martha bei zu legen. Der "Onkel" hat zu gut aufgepasst. Sie darf weder schreiben noch Briefe empfangen. Liebes Tanterle, Du schreibst, wir sollen Gottvertrauen haben. Ich glaube nicht an Gott. Warum hat er uns so gestraft? Ich kann Dir nicht schildern, was wir mitgemacht haben. Mir hat Gott meine lieben

EHRI-ET-WL1375B310

DLA



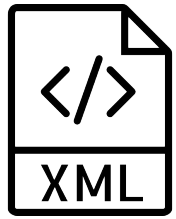
Automatic text recognition on segmented components

Transformation of combined DLA and text recognition outputs into <TEI>

ENRICHING THE TRANSCRIPTIONS SEMI-AUTOMATICALLY

TEI-XML

- **XML standard** for encoding textual documents
  - Sustained by the **TEI Consortium** and improved by the involvement of its community
- **Semantic encoding** of the text (e.g. useful for **disambiguation tasks**)




```
<placeName type="city">Warsaw</placeName>
<placeName type="ghetto">Warsaw</placeName>
```

Text Encoding Initiative

- TEI Guidelines = **recommendations**
- EHRI ODD = **customization of the TEI for Holocaust testimonies**
  - Contains both **specifications** and **documentation**
  - **Framework** for the encoders

Homogenizing the encoding

- **English** = main language for **metadata** encoding
- ISO norms for **data reusability**
  - **ISO 639** for **language codes** ⇨ *Iana Language Subtag Registry*
  - **ISO 3166** for representing the **names of countries** ⇨ `<country key="DE">Germany</country>`
  - **ISO 8601** for **dates** ⇨ `<date when-iso="YYYY-MM-DD"/>`
- Integration of the **EHRI controlled vocabulary** on the EHRI Portal
- **Avoid encoding mistakes** generated by manual encoding
  - `@type="subeject"`
  - `@type="subjekt"`

Automating parts of the encoding

Ready-to-use templates for an encoding by hand

- Use of the **recurrent metadata** present in the EHRI Online Editions
- **Templates** for the files and the indexes

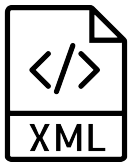
Python scripts for a semi-automated encoding

- Created along the model of **this script** and **this script**
- Use of **punctuations, lines and recurrent elements** to encode part of the document such as the structure, the keywords, etc.
- **Script** already done to **update** the online editions already created

PROPOSING A CENTRALIZED INTERFACE FOR FUTURE HOLOCAUST-RELATED EDITIONS

TEI Publisher is …

- a platform based on eXist-db, a database management system based on **XML technology**
- an **easy-to-use tool** to publish TEI XML files or other types of XML
- a ***prêt-à-porter* application** customizable with few tweaks



The EHRI TEI Publisher application

- Generation of a **TEI Publisher application** dedicated to the EHRI editions
- Retrieval of the **concept and themes** of the websites already existing
- Addition of the **homogenized XML files**
- Creation of **XML indexes** containing the information of all **named entities from the editions**

The EHRI TEI Publisher application

Perks of the EHRI TEI Publisher application

- **Centralization** of information
  - All the collections are in the **same place**
  - Display of the text, image, map, and even named entities information at the **same level**
- Easier **accessibility** of the whole content
- Several **filter options** available to look through a collection

Home Collections About History rechercher... Langue Français Se connecter

EHRI Online Editions

Trier par Titre Filtrer selon Titre Filtrer

Bordered Escape

This edition gathers documents testifying of the increasingly restrictive refugee policy in Czechoslovakia, following the "Anschluss.

Early Holocaust Testimonies

This edition gathers accounts of the persecution of Jews from the Nazi takeover of power in Germany (1933) to the Eichmann Trial (1961).

Diplomatic Reports

This edition gathers reports on the persecution and murder of European Jews.

Nisko Deportations

This edition gathers documents on the deportation of thousands of Jews to Nisko am San (Poland).

Documentation Campaign

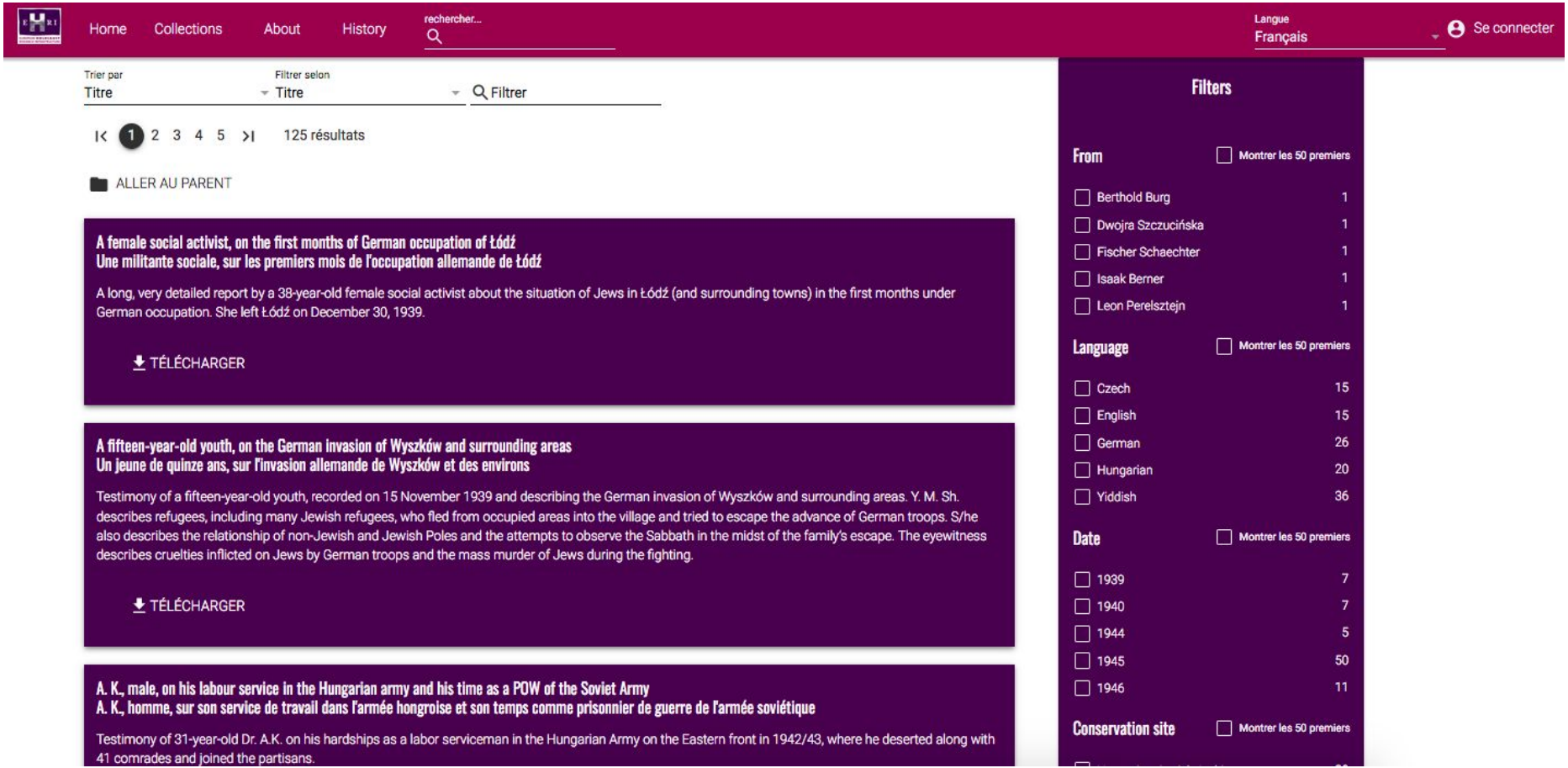
This edition gathers documents on the deportation of thousands of Jews to Nisko am San (Poland).

TEI Publisher **0.1** / web components **2.19.0** / API **1.0.0**

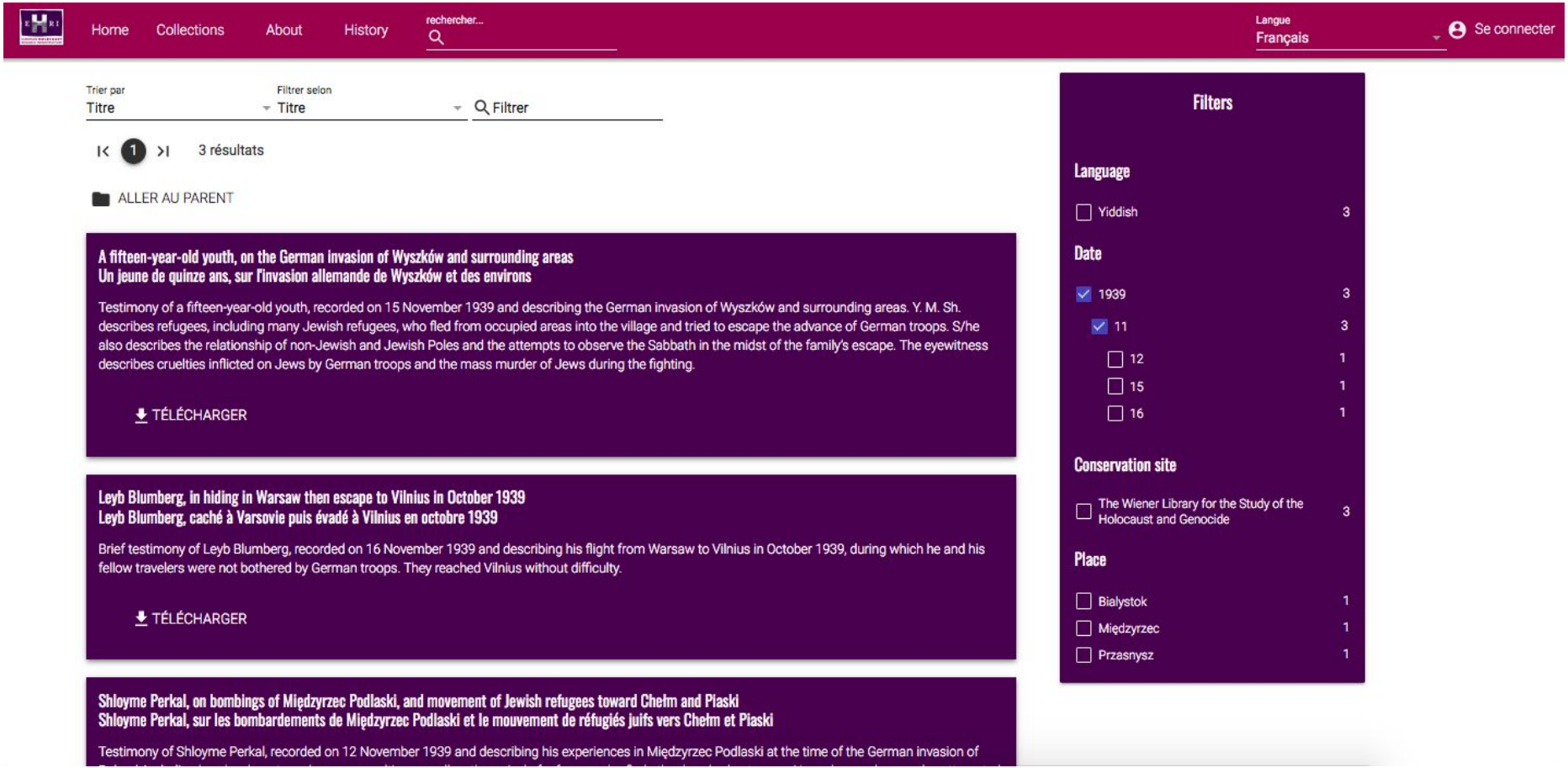
This application was developed as part of the EHRI project with the help of TEI Publisher.

Powered by editiones

Homepage of the TEI Publisher EHRI application



Early Holocaust Testimonies collection



Filter options for a collection

View
Original version

קאָמיטעט צו זאַמלען מאַטעריאַלן

וועגן יידישן חורבן אין **פוילן** 1939

י.מ.ש.

ווישקאָוו

יאָר אַלט, ביי די עלטערן 18

פראָפאָקאָל נומער 3

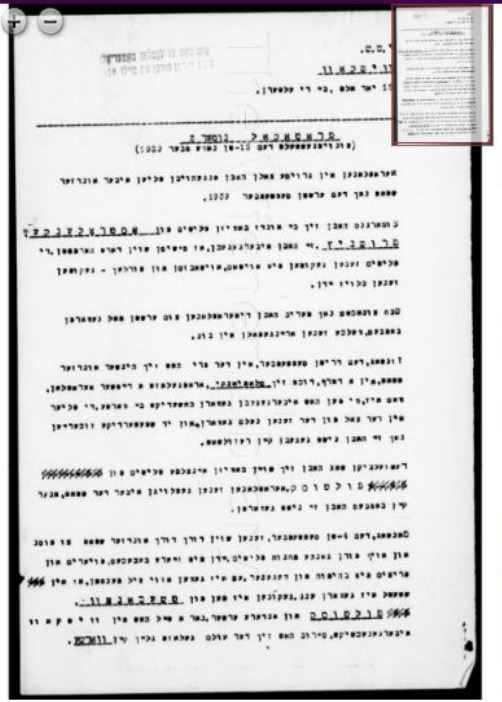
(צונויפגעשטעלט דעם 15טן נאָוועמבער 1939)

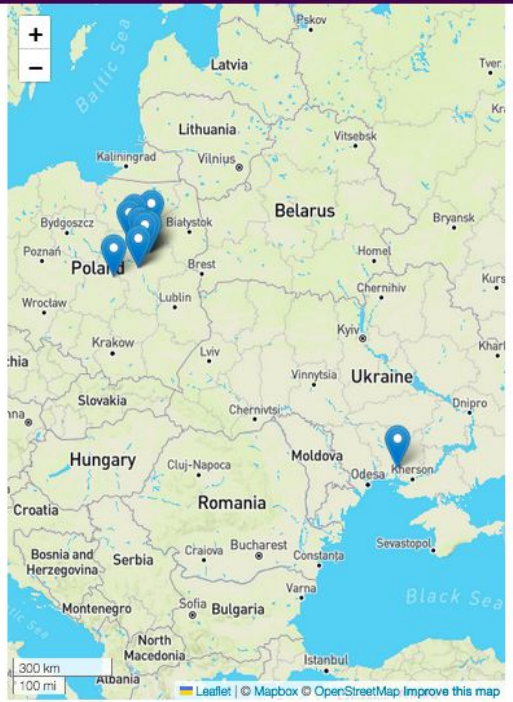
אַרעאָפלאַנען אין גרויסע צאָלן האָבן אָנגעהויבן פֿליִען איבער אונדזער שטאָט נאָך דעם ערשטן סעפטעמבער 1939.

צומאָרגנס האָבן זיך ביי אונדז באַוויזן פליטים פון **אָסטראָלענקע, פרושניץ**. זיי האָבן איבערגעגעבן, אַז ס'שיסן שוין דאָרט האָרמאַטן. די פליטים זענען געקומען מיט אויטאָס, אויטאָבוסן און פֿורלעך – געקומען זענען בלויז יידן.

שבת צו נאַכטס נאָך מעריב האָבן די אַרעאָפלאַנען צום ערשטן מאָל געווארפֿן באָמבעס, וועלכע זענען אַריינגעפאַלן אין **בוג**.

זונטאָג, דעם דריטן סעפטעמבער, אין דער פֿרי האָט זיך הינטער אונדזער שטאָט, אין





Original text with the facsimile and the map

View
Translation

Committee to Collect Material

about the Destruction of **Polish** Jewry 1939

Y. M. Sh.

Wyszków

Age: 15 years; living with his parents

Testimony number 3

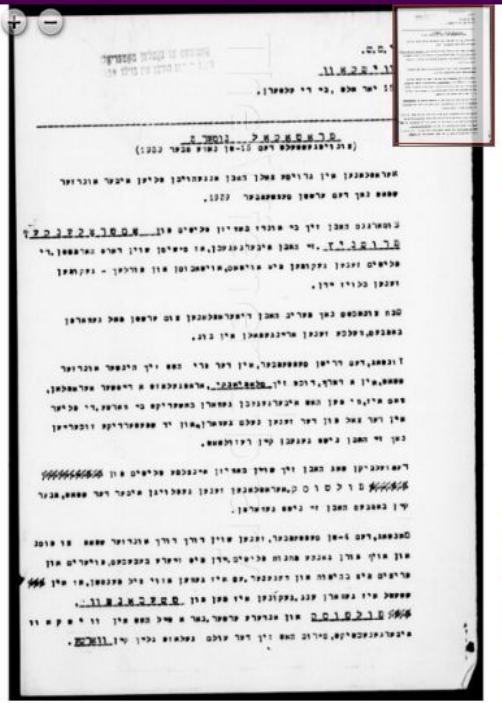
(recorded on the 15th of November, 1939)

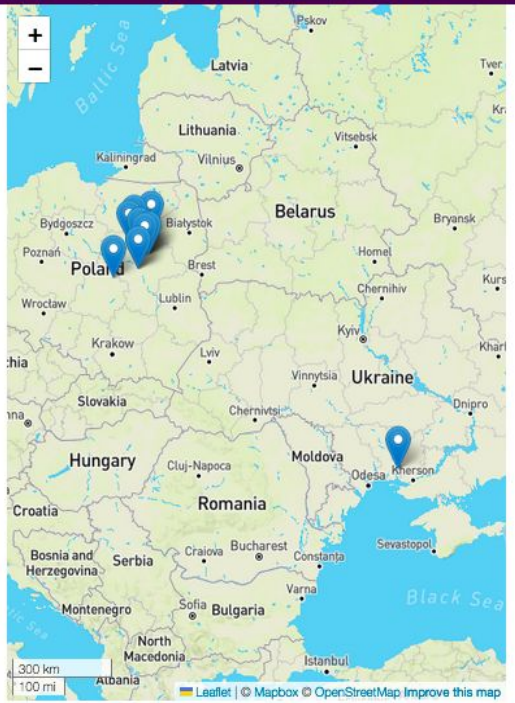
A lot of airplanes started to fly over our town after the 1st of September 1939.

The next day we saw refugees from **Ostrołęka** and **Przasnysz**. They reported that cannons were shooting there already. The refugees came by car, bus and horse and wagon; all of them were Jews.

On Saturday evening, after the evening prayers, airplanes dropped bombs for the first time. They fell in the river **Bug**.

On Sunday, the 3rd of September in the morning, a German airplane





Translated text with the facsimile and the map

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PREVIOUS PAGE TABLE OF CONTENTS METADATA DISPLAY CITATION LICENCE NEXT PAGE

Metadata

Title

A fifteen-year-old youth, on the German invasion of Wyszków and surrounding areas

Time and place of writing

15.11.1939

Collection history

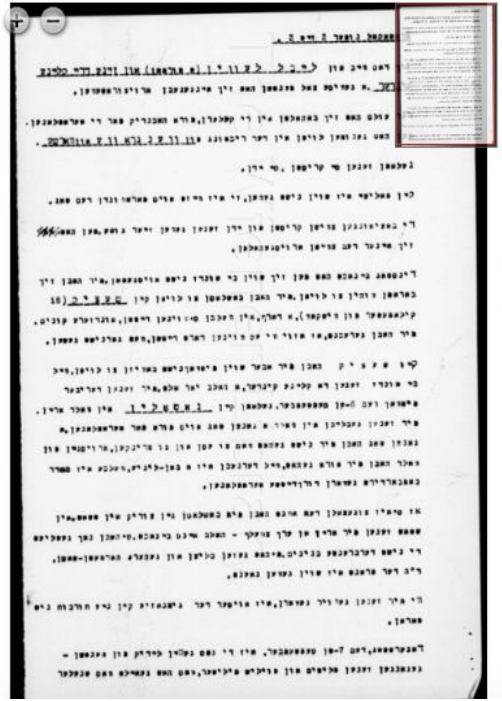
- Collection : Persecution of Jews in Poland: reports and statements, microfilm (coll. 532)
- Institution : The Wiener Library for the Study of the Holocaust and Genocide

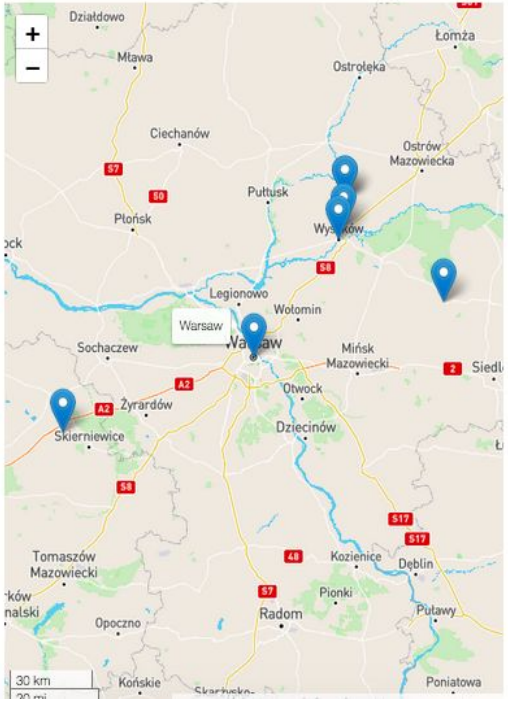
Encoding

- Project :

ounding areas — Un jeune de quinze ans, sur l'invasion allemande de Wyszków et des environs

d his three small children. A
rescued.
planes. Other escaped in the
way.
parently they disappeared the
l Jews was very good. People
undressed for the night. We
ded to run to the village of
re some Germans were living,
would happen in a place where
escape to **Sieczychy**, because in





Display of the metadata on the TEI Publisher application

A fifteen-year-old youth, on the German invasion of Wyszków and surrounding areas — Un jeune de quinze ans, sur l'invasion allemande de Wyszków et des environs

View
Translation

the wife of **Leybl Levin** (a coachman) and his three small children. A certain [illegible] successfully rescued.

Levin, Leybl
Coachman from Wyszków.

People [illegible] of the airplanes. Other escaped in the directions of **Węgrow** and **Warsaw**.

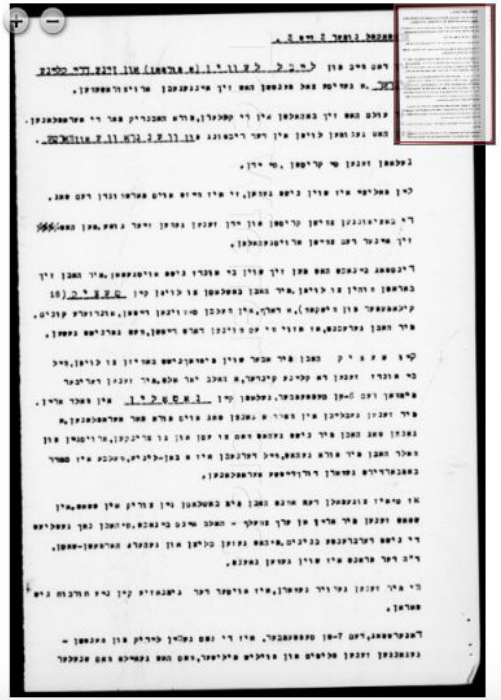
Both Christians and Jews were running away.

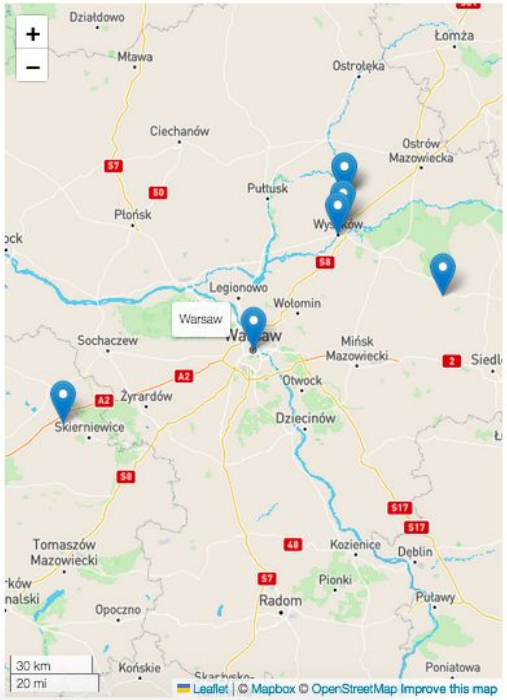
There were no policemen any more, apparently they disappeared the same day.

The relationship between Christians and Jews was very good. People were helping each other.

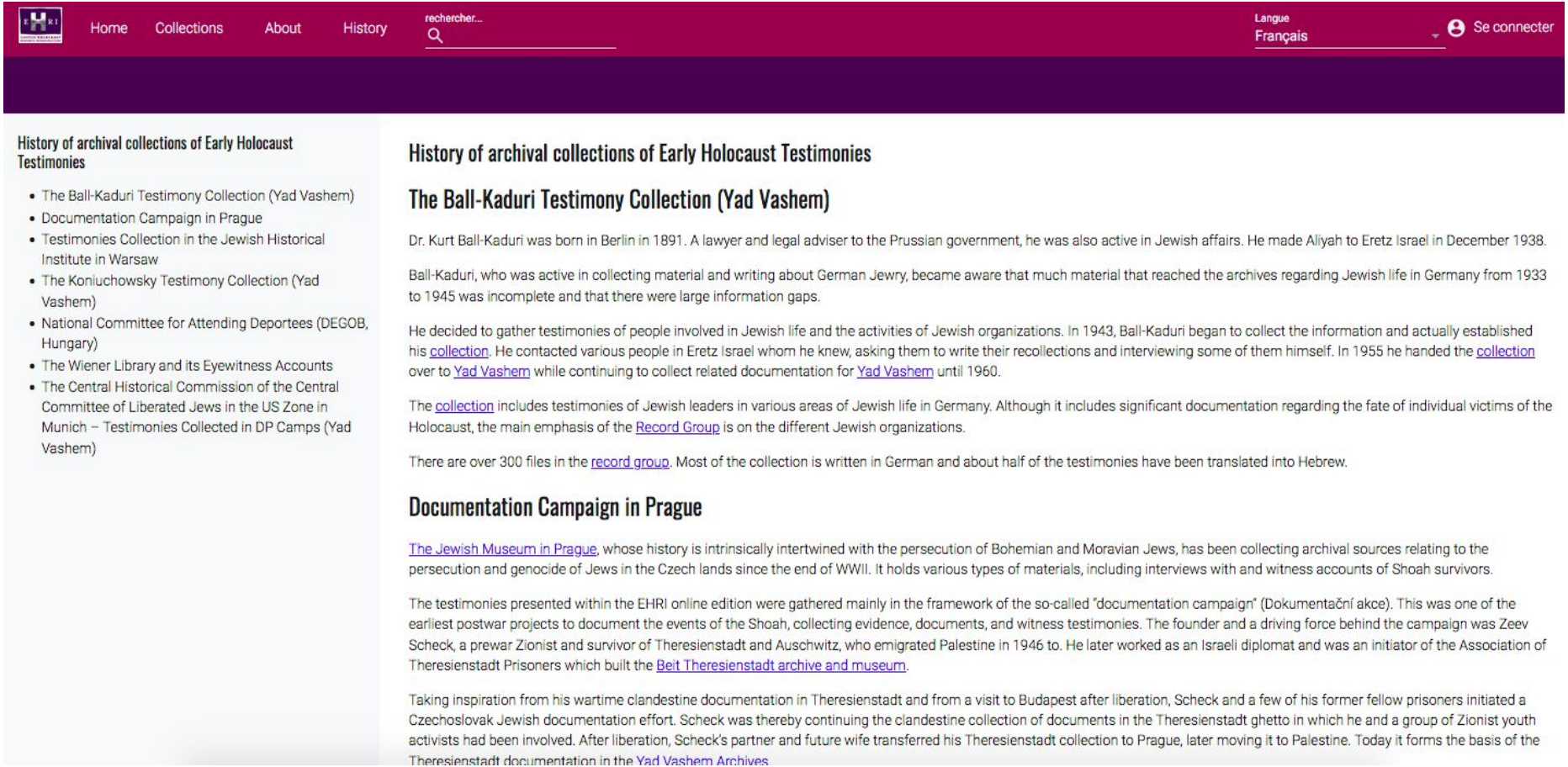
Tuesday in the evening we did not get undressed for the night. We discussed to where to escape. We decided to run to the village of **Sieczychy** (18 km from **Wyszków**), where some Germans were living, our customers. We believed that nothing would happen in a place where Germans were living.

But on Wednesday we did not manage to escape to **Sieczychy**, because in our family there are small children, six months old. So on Wednesday,





Display of a named entity on the TEI Publisher application



HTML page of the "History of archival collections of Early Holocaust Testimonies"

CONCLUSION

Conclusion

- **Feedback** for the use of one or several of our solution
- Layout analysis
  - **Sample** other EHRI Online Editions
  - **Annotate** more images
  - Have a **more balanced class representation**
  - **Apply DLA model** on new Holocaust-related documents to test the model's robustness on unseen data
- Finishing the semi-automated encoding **scripts**
- Possible **online launch** of the application

RESOURCES

Web resources

- EHRI dataset for ATR: https://github.com/FloChiff/ehri-dataset/tree/main
  - Presentation of the EHRI ATR dataset: https://flochiff.github.io/phd/dataset/ehri/dataset.html
- EHRI dataset for layout segmentation: https://universe.roboflow.com/ehri/ehri-ladas
- ODD EHRI: https://github.com/SarahBeniere/EHRI-Workflow/tree/main/ENCODING/Guidelines
- TEI Publisher: https://teipublisher.com/index.html
- eScriptorium: https://escriptorium.inria.fr/
- EHRI Online Editions: https://github.com/EHRI/ehri-online-editions

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Thank you for your attention

Any questions ?

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