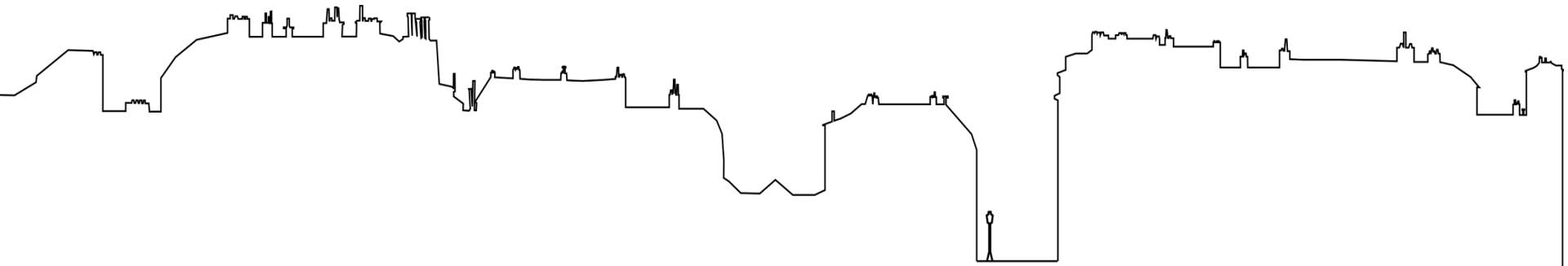


# Reconstructing the location of Parisian address numbering in the 19th century by cross-referencing spatial and social sources

ICHC 2024

Pascal Cristofoli, Bertrand Duménieu, Mathieu  
Fernandez, Julien Perret



# Historians need to geocode addresses

Historical documents are full of geographical information that **require** geocoding

**BUT** Historical documents are also full of geographical information that **help** geocoding

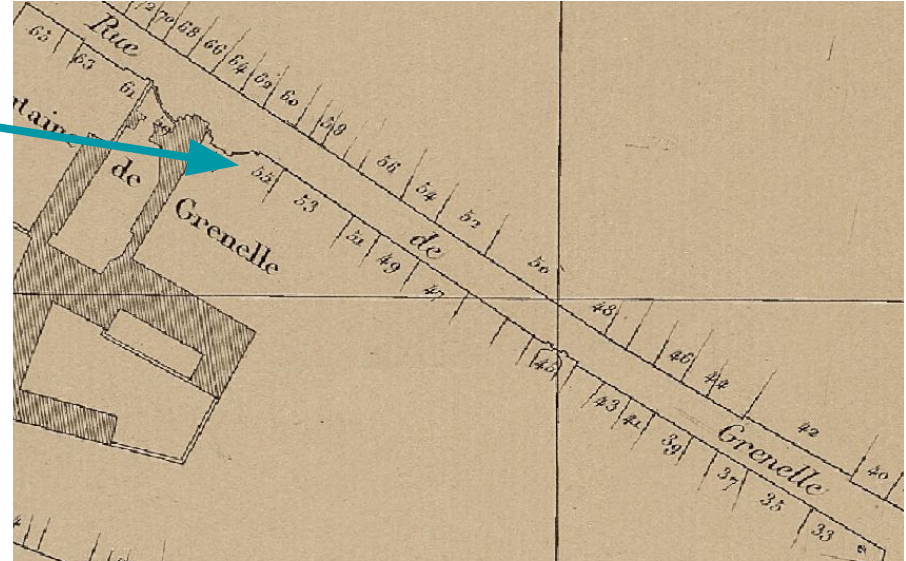
PARIS, IMPRIMERIE DE PAUL DUPONT,  
RUE DE GRENELLE-SAINTE-HONORÉ, N° 55.

Le papier sur lequel est imprimé l'*Almanach du Commerce* de 1837 a été fourni par MM. Montgolfier et Blanchet; il a été fabriqué à la mécanique et provient de leur manufacture de Roanne (Loire).

Extraction of entries from 357 lists in 144 books

22 743 928 entries

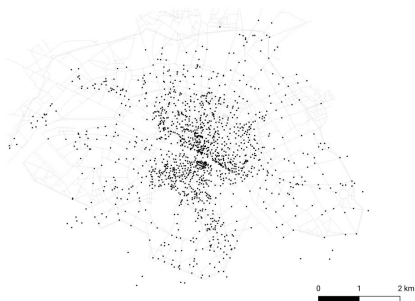
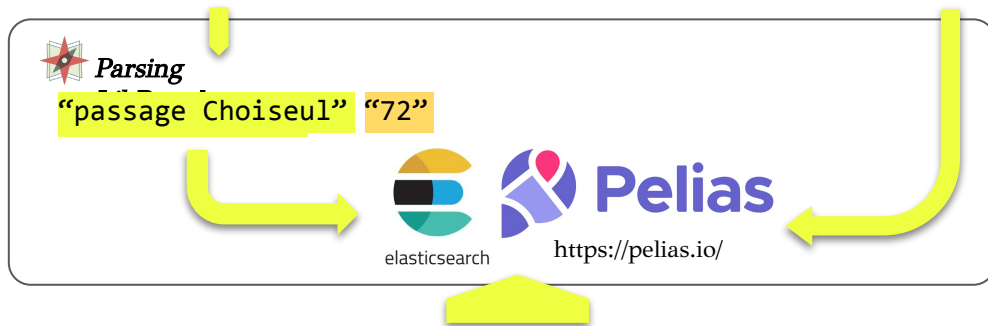
**27 618 637 addresses to geocode!**



# Geocoding historical addresses using gazetteers

*adresse*  
"passage Choiseul, 72"

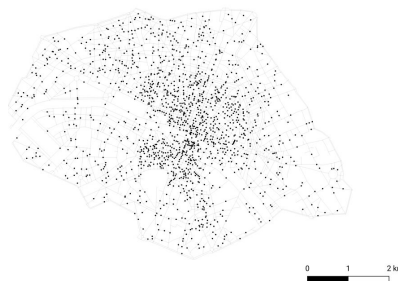
*target year (scalar or interval)*  
[1850,1852]



Atlas de Verniquet, 1784-1795 ⌚  
Street network



Atlas de Jacoubet, 1827-1836 ⌚  
Street network & address points



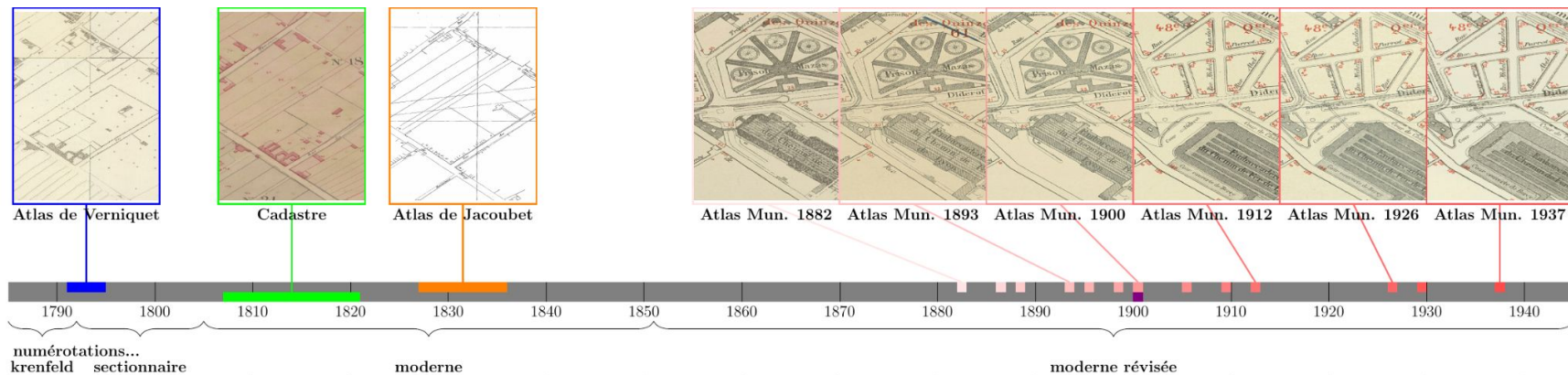
Plan Andriveau-Goujon, 1849 ⌚  
Street network



Atlas municipal des 20 arrds., 1888 ⌚  
Street network & address points

# Sources to build gazetteers

Usually maps, atlases, cadastres, etc.

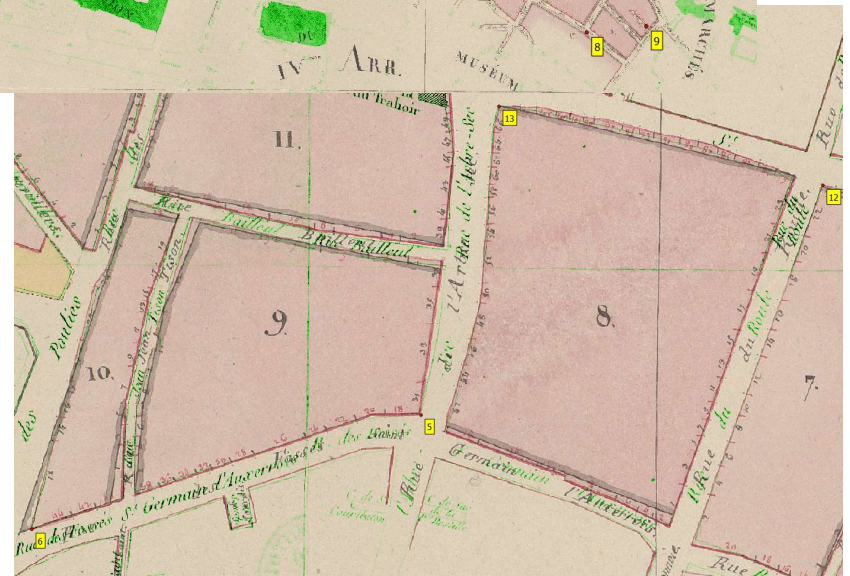
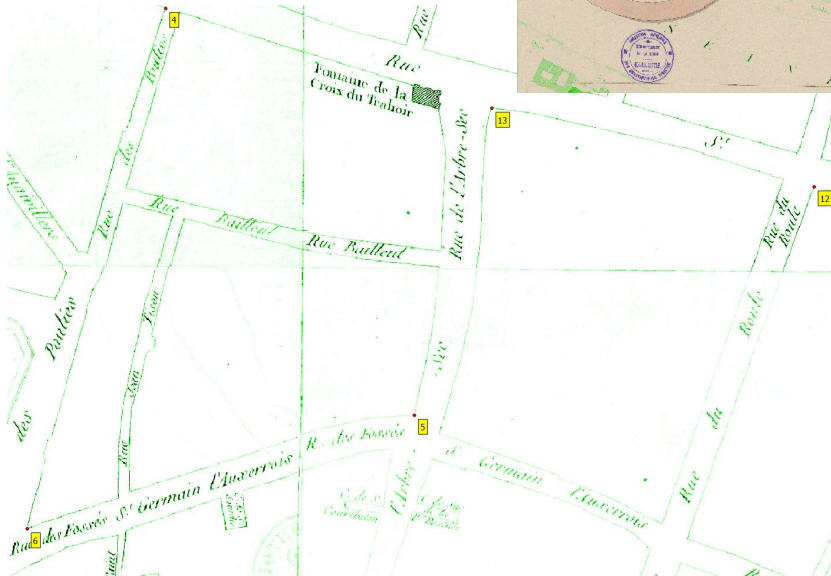
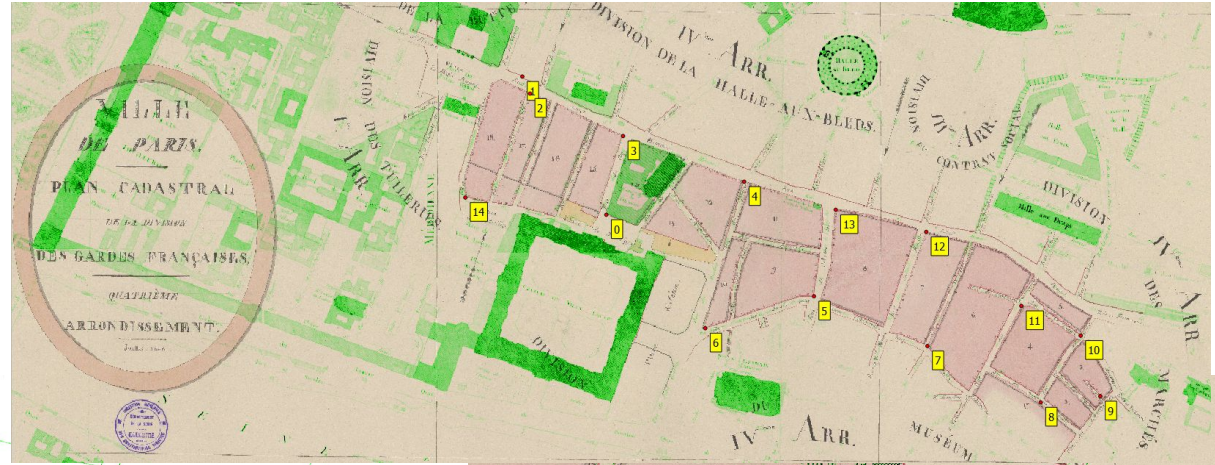


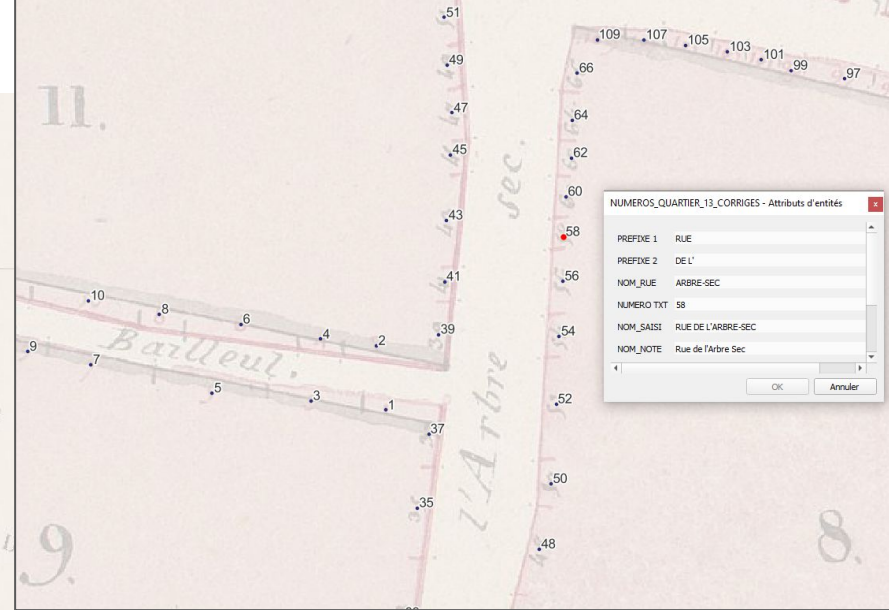
We'll use

- The first **cadastre** of Paris (*Atlas général de Paris (CP/F/31/1 et 2), 1807-1821*)
- The **Jacoubet atlas** of Paris (*Atlas général de la Ville, des faubourgs et des monuments de Paris, 1836*)
- A **correspondence table** for the house numbers (*Almanach-Bottin du commerce de Paris, 1851*)
- The **Atlas municipal** of Paris (*Atlas municipal des vingt arrondissements de la Ville de Paris, 1888*)

# Cadastre: Atlas général de Paris (CP/F/31/1 et 2), 1807-1821)

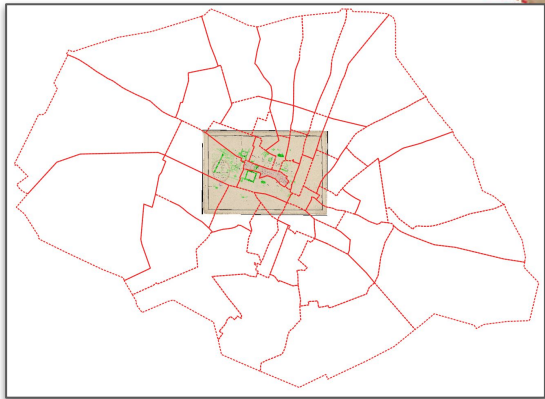
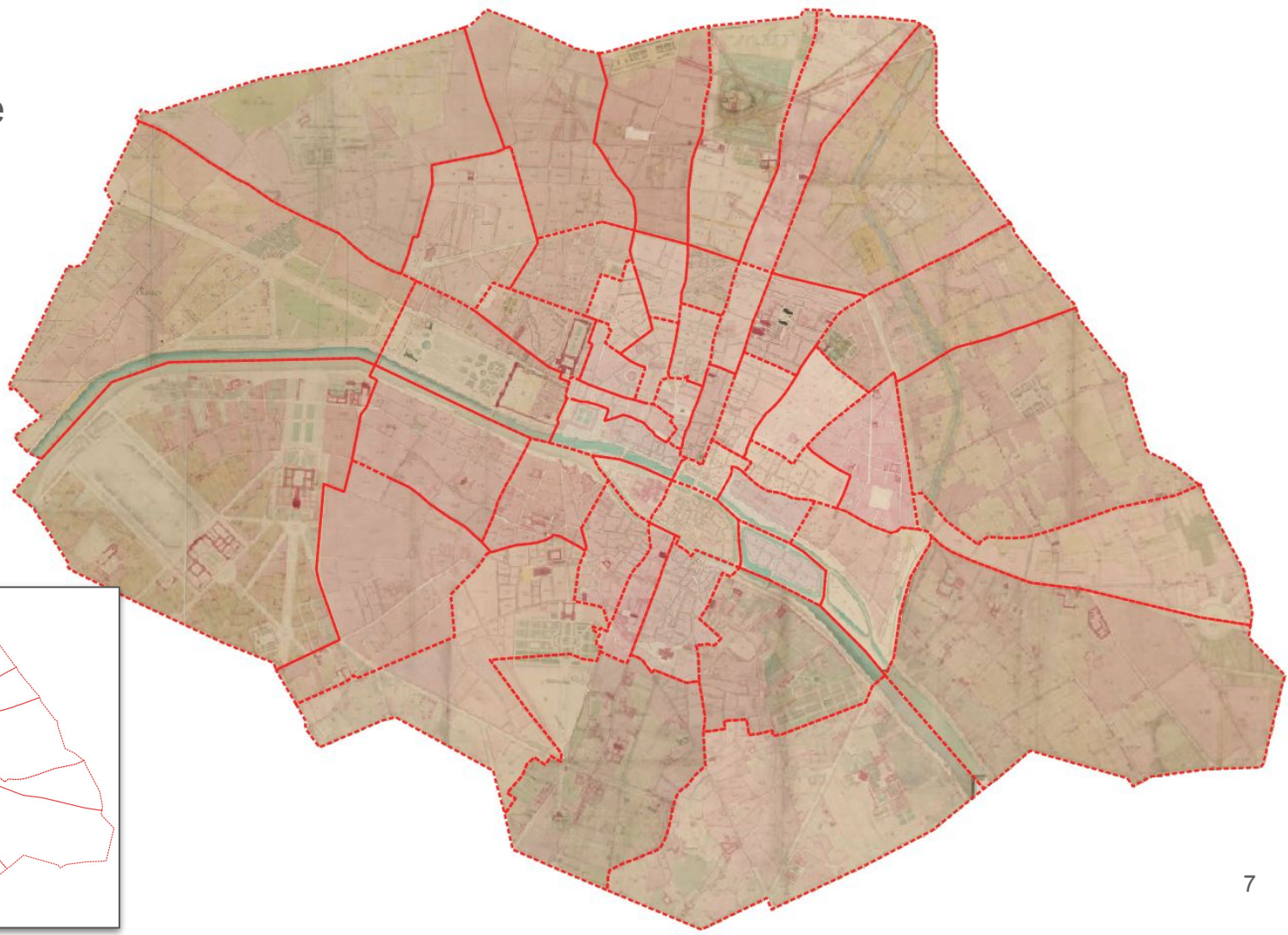
Georeferenced on  
Verniquet





Locating **address points** on original sheets  
(not georeferenced)

Reconstruction of  
the Atlas using the  
**boundaries of  
the districts** as  
masks





**27 000 addresses & 1100 distinct street names**



# Correspondence table for the house numbers (Almanach-Bottin du commerce de Paris, 1851)

## ALMANACH-BOTTIN.

1851

9103

### NUMÉROTAGE DES MAISONS DE PARIS

#### CORRESPONDANCE EXACTE ENTRE LES NUMÉROS NOUVEAUX ET LES ANCIENS

(Compris les rues prolongées ou réunies).

N. B. — L'opération du numérotage, qui se continue par reprises depuis plus de trois ans, touche heureusement à sa fin. Par suite, il s'est introduit dans les numéros une confusion très-préjudiciable au commerce, le numérotage de certaines rues s'opérant souvent après notre recensement.

C'est pour y remédier autant que possible que nous publions le travail qui va suivre, et auquel, en cas de doute, nous engageons MM. les commerçants à recourir. C'est un document officiel.

Cette liste comprend toutes les rues numérotées jusqu'au 31 octobre 1850. Nous la compléterons l'an prochain. Dans la série des numéros pairs, comme dans celle des numéros impairs, les numéros anciens forment la première colonne et les nouveaux numéros la seconde.

Les numéros nouveaux d'une rue suivent toujours du premier au dernier, sauf les lacunes pour terrains non-bâti, où des numéros sont réservés.

Mais quand une rue est prolongée d'une ou plusieurs autres, il se trouve nécessairement dans les numéros anciens plusieurs séries commençant par 1, affectées d'ailleurs du nom de la rue réunie. C'est là surtout que les différences sont plus considérables et qu'il importe d'avantage encore de vérifier.

Les rues qui n'ont qu'une colonne, manquent de N<sup>os</sup> pairs ou de N<sup>os</sup> impairs.

PAIRS.		IMPAIRS.		PAIRS.		IMPAIRS.		PAIRS.		IMPAIRS.	
anc. nouv.	anc. nouv.	anc. nouv.	anc. nouv.	anc. nouv.	anc. nouv.	anc. nouv.	anc. nouv.	anc. nouv.	anc. nouv.	anc. nouv.	
Abbaye (r. de l').											
2	2	1	4	2	6	#	#	4	14	#	#
4	4	3	3	4	8	5	5	6	10	#	#
#	6	3	5	6	10	7	7	10	20	#	#
6	#	5	7	8	12	9	9	12	22	#	#
8	8	7	9	10	#	11	11	#	24	#	#
10	10	9	11	12	16	13	13	Alligre (r. d')			
12	12	11	13	#	20	15	15	2	2	#	1
14	14	13	15	16	20	17	17	4	4	4	3
#	16	15	17	Air (avenue du Bel-)				6	6	16	5
18	#	#	#	5	6	#	5	6	8	3	7
4	2	#	1	#	#	#	7	8	10	5	9
6	4	#	#	#	14	#	#	10	12	#	#
8	6	#	#	#	18	#	15	10b.	14	#	#
Abbeville (r. d').											
#	2	1	1	Albouy (r.)				12	16	#	#
2	4	3	3	2	2	1	1	Amandriers (chemin de ronde des)			
4	6	5	5	4	4	3	3	30	9	#	#
#	7	7	7	6	6	5	5	#	15	#	#
#	#	9	#	8	8	7	7	3	23	6	2
Aguesseau (r. d')											
2	2	1	1	10	10	9	9	6	10	#	1
4	4	3	3	12	12	11-11b.	11	8	12	#	8
6	6	#	5	14	14	13	13	#	14	#	5
8	8	7	7	16	16	15	15	#	16	#	7
10	#	9	9	18	18	15	17	#	18	#	9
12	12	11	11	20	20	#	#	#	19	#	11
14	#	13	13	Alger (r. d').				10	11	16	14
16	16	15	15	2	2	1	1	8	18	#	15
18	18	#	#	4	4	3	3	6	15	#	17
20	20	#	9	6	6	5	5	4	17	#	19
22	22	#	#	8	8	9	9	6	17	#	21
Aguesseau (r. du Marché d').											
#	#	1	1	10	10	11	11	8	18	#	23
#	#	3	3	12	12	13	13	10	19	7	9
Arbre-Sec (r. de l').											
2	2	1	1	14	14	#	#	2	2	1	1
4	4	#	#	16	16	#	#	4	4	3	3
6	6	#	#	18	18	#	#	6	6	5	5
8	8	#	#	20	20	#	#	8	8	7	7
10	10	#	#	2	2	1	1	10	10	9	9
12	12	#	#	4	4	3	3	12	12	9-11	11
14	14	#	#	6	6	5	5	14	14	13	13
16	16	#	#	8	8	7	7	16	16	15	15
18	18	#	#	10	10	#	#	18	18	17	17
20	20	#	#	12	12	#	#	20	20	#	#
22	22	#	#	14	14	#	#	22	22	#	#
24	24	#	#	16	16	#	#	24	24	#	#
26	26	#	#	18	18	#	#	26	26	#	#
28	28	#	#	20	20	#	#	28	28	#	#
30	30	#	#	22	22	#	#	30	30	#	#
32	32	#	#	24	24	#	#	32	32	#	#
34	34	#	#	26	26	#	#	34	34	#	#
36	36	#	#	28	28	#	#	36	36	#	#
38	38	#	#	30	30	#	#	38	38	#	#
40	40	#	#	32	32	#	#	40	40	#	#
42	42	#	#	34	34	#	#	42	42	#	#
44	44	#	#	36	36	#	#	44	44	#	#
46	46	#	#	38	38	#	#	46	46	#	#
48	48	#	#	40	40	#	#	48	48	#	#
50	50	#	#	42	42	#	#	50	50	#	#
52	52	#	#	44	44	#	#	52	52	#	#
54-56	54	#	#	46	46	#	#	54-56	54	#	#
58	58	#	#	48	48	#	#	58	58	#	#
60	60	#	#	50	50	#	#	60	60	#	#
62	62	#	#	52	52	#	#	62	62	#	#
64	64	#	#	54-56	54	#	#	64	64	#	#
66	66	#	#	58	58	#	#	66	66	#	#
68	68	#	#	60	60	#	#	68	68	#	#

PAIRS.		IMPAIRS.	
anc. nouv.	anc. nouv.	anc. nouv.	anc. nouv.
#	#	17	29
#	#	19	31
26	36	21	33
#	40	23	35
#	42	#	#
28	44	25	39
#	#	25b.	#
#	#	#	#
#	#	#	#

#### Arbre-Sec (r. de l').

2	2	1	1
4	4	3	3
6	6	5	5
8	8	#	#
10	10	9	9
12	12	11	11
14	14	13	13
16	16	15	15
18	18	17	17
20	20	19	19
22	22	21	21
24	24	23	23
26	26	25	25
28	28	27	27
30	30	29	29
32	32	31	31
34	34	33	33
36	36	35	35
38	38	37	37
40	40	39	39
42	42	41	41
44	44	43	43
46	46	45	45
48	48	47	47
50	50	49	49
52	52	51	51
54-56	54	#	#
58	58	#	#
60	60	#	#
62	62	#	#
64	64	#	#
66	66	#	#
68	68	#	#

# Evaluating the gain of using historical gazetteers

For each gazetteer:

- We choose a “**close**” **address directory**
  - We geocode the chosen directory
    - With the **historical gazetteer**
    - With a **modern gazetteer** (here the national address database - BAN)
  - We **compare** the two versions of the geocoded directory
- 

**Cadastre napoléonien** 1808-1825

**Annuaire La Tynna** 1817

**Jacoubet** 1836

**Annuaire Bottin** 1837

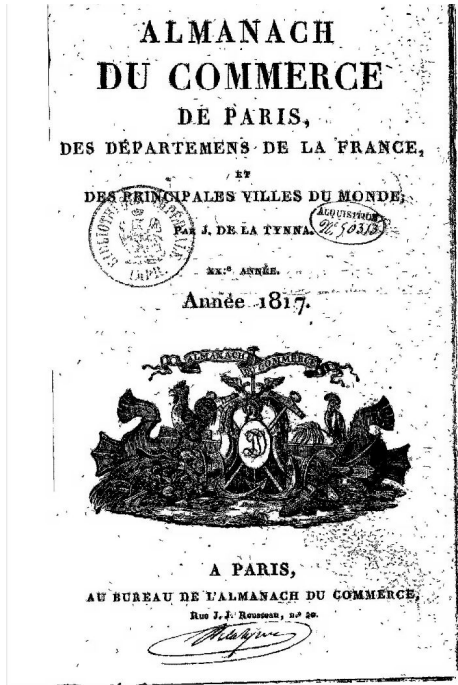
**Table de passage** 1851

**Annuaire Didot** 1853

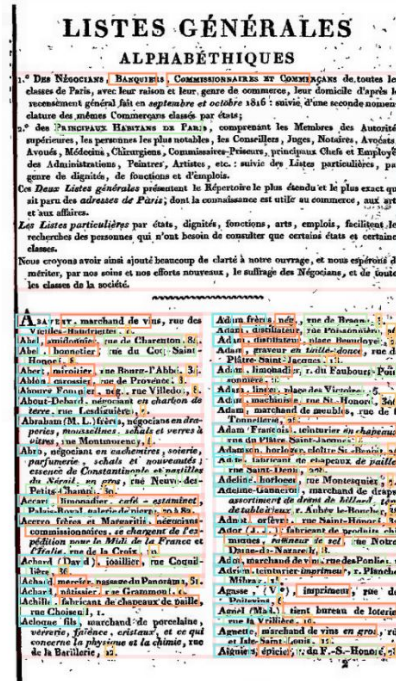
**Atlas municipal** 1888

**Annuaire Didot-Bottin** 1880

# Annuaire La Tynna 1817



[Document in Gallica](#)



[Content extracted from SoDUCo](#)

# Annuaire La Tynna 1817



Geocoded with modern data

Geocoded with the Cadastre

# Annuaire La Tynna 1817



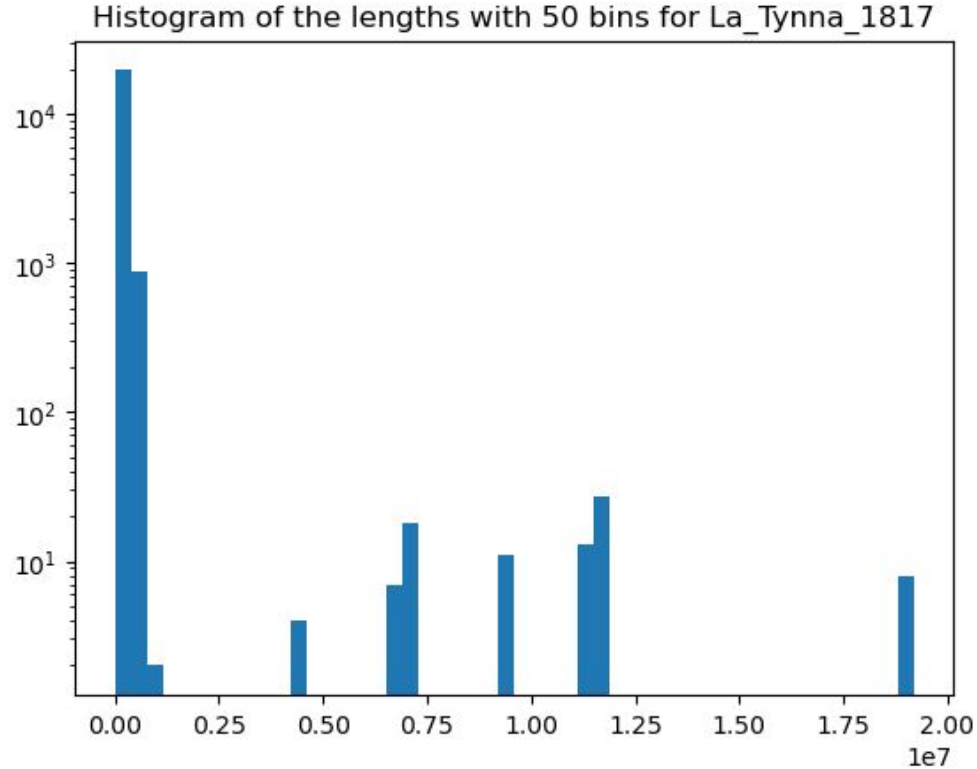
Geocoded with modern data



Geocoded with the Cadastre

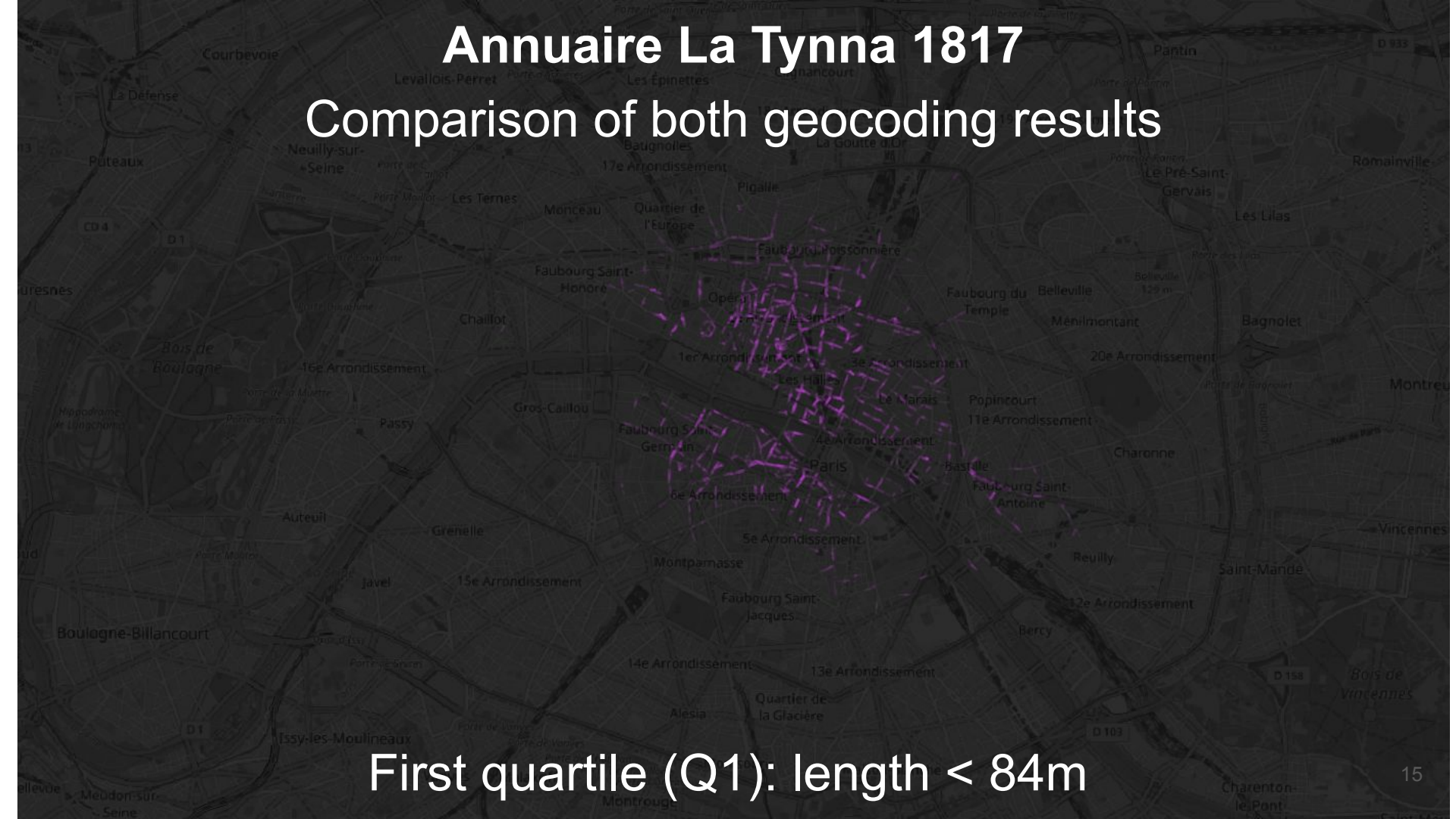
# Annuaire La Tynna 1817

## Comparison of both geocoding results



# Annuaire La Tynna 1817

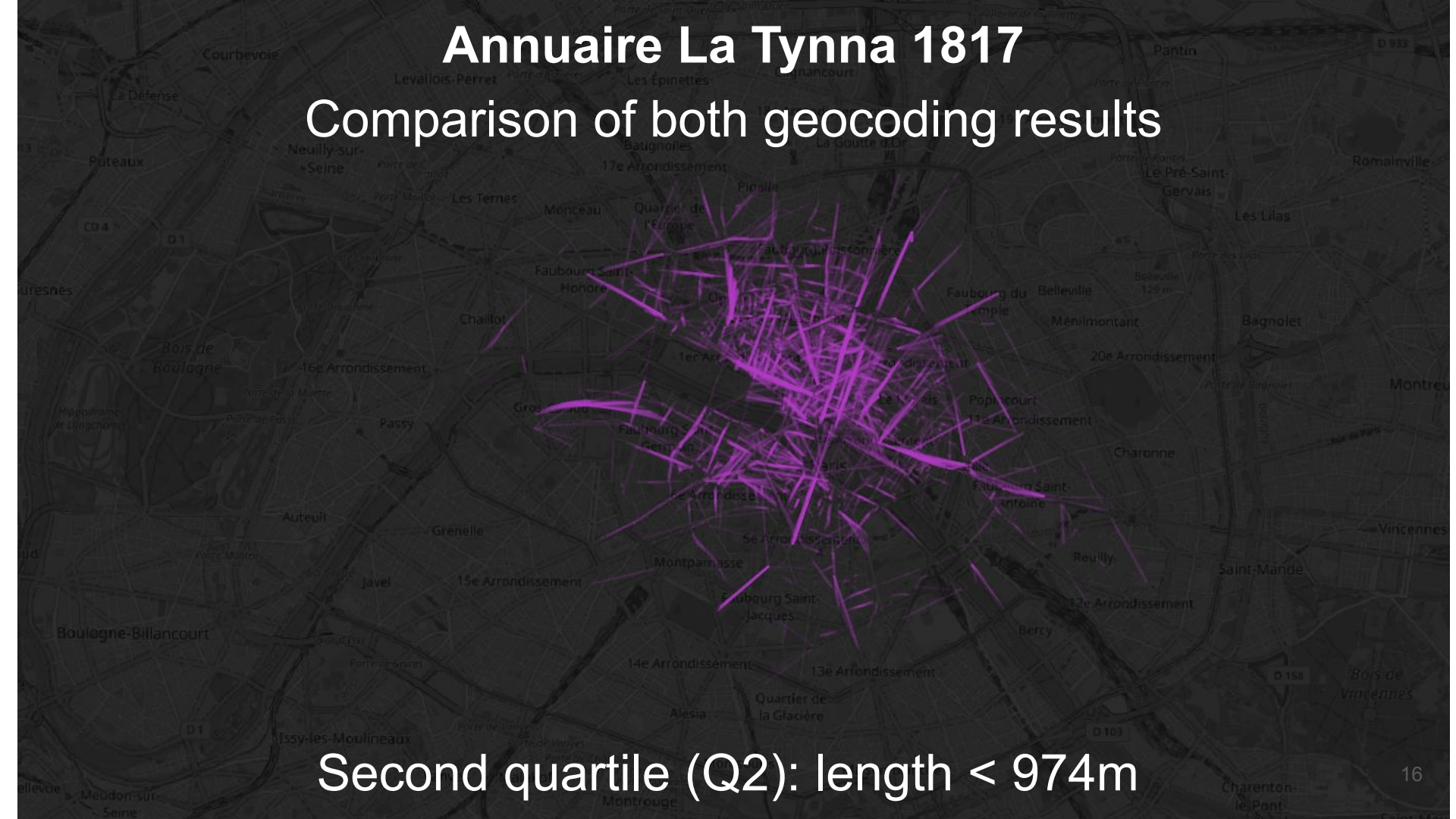
## Comparison of both geocoding results

A map of Paris, France, showing the city's layout and various districts. The map is overlaid with a dense network of purple lines, representing the geocoding results for the first quartile (Q1) of street lengths. The lines are concentrated in the central and eastern parts of the city, particularly in the areas around the 1st, 2nd, 3rd, 4th, and 5th arrondissements. The map also shows the names of various districts and arrondissements, such as Courbevoie, Levallois-Perret, Les Epinettes, Pigalle, Opéra, Les Halles, and Paris. The text "Annuaire La Tynna 1817" and "Comparison of both geocoding results" is displayed at the top, and "First quartile (Q1): length < 84m" is displayed at the bottom.

First quartile (Q1): length < 84m

# Annuaire La Tynna 1817

## Comparison of both geocoding results

A map of Paris, France, showing the city's layout and various districts. Overlaid on the map are numerous purple lines of varying lengths and orientations, representing geocoding results. The lines are most densely clustered in the central part of the city, particularly in the 1st, 2nd, 3rd, and 4th arrondissements. The lines radiate outwards from the center, following the street grid and major thoroughfares. The background map is dark, and the text is white.

Second quartile (Q2): length < 974m



# Annuaire La Tynna 1817

## Comparison of both geocoding results

Third quartile (Q3): length < 4027m

# Annuaire La Tynna 1817

## Comparison of both geocoding results

Fourth quartile (Q4): length  $\geq 4027\text{m}$

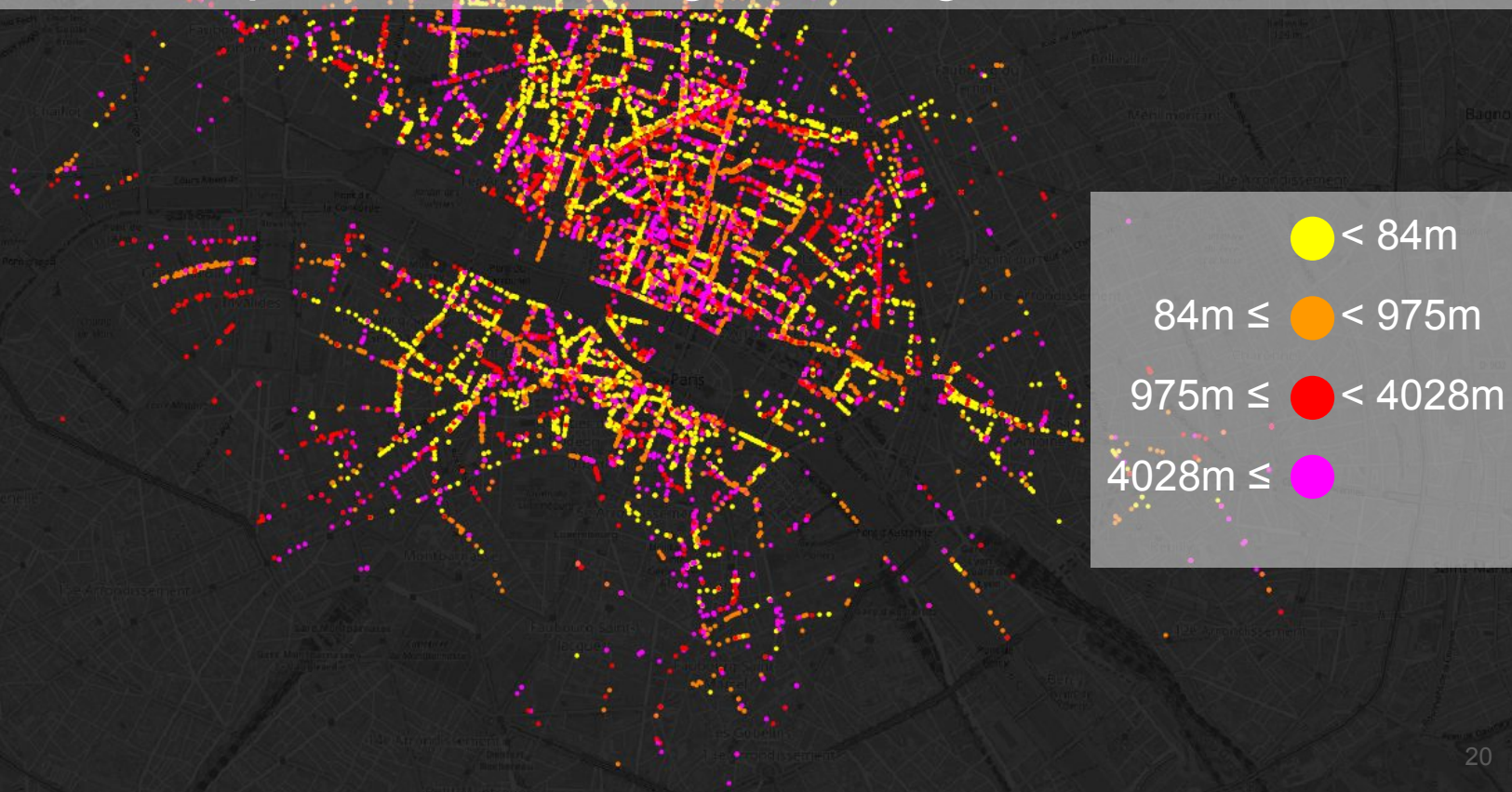
# Annuaire La Tynna 1817

Comparison of both geocoding results



# Annuaire La Tynna 1817

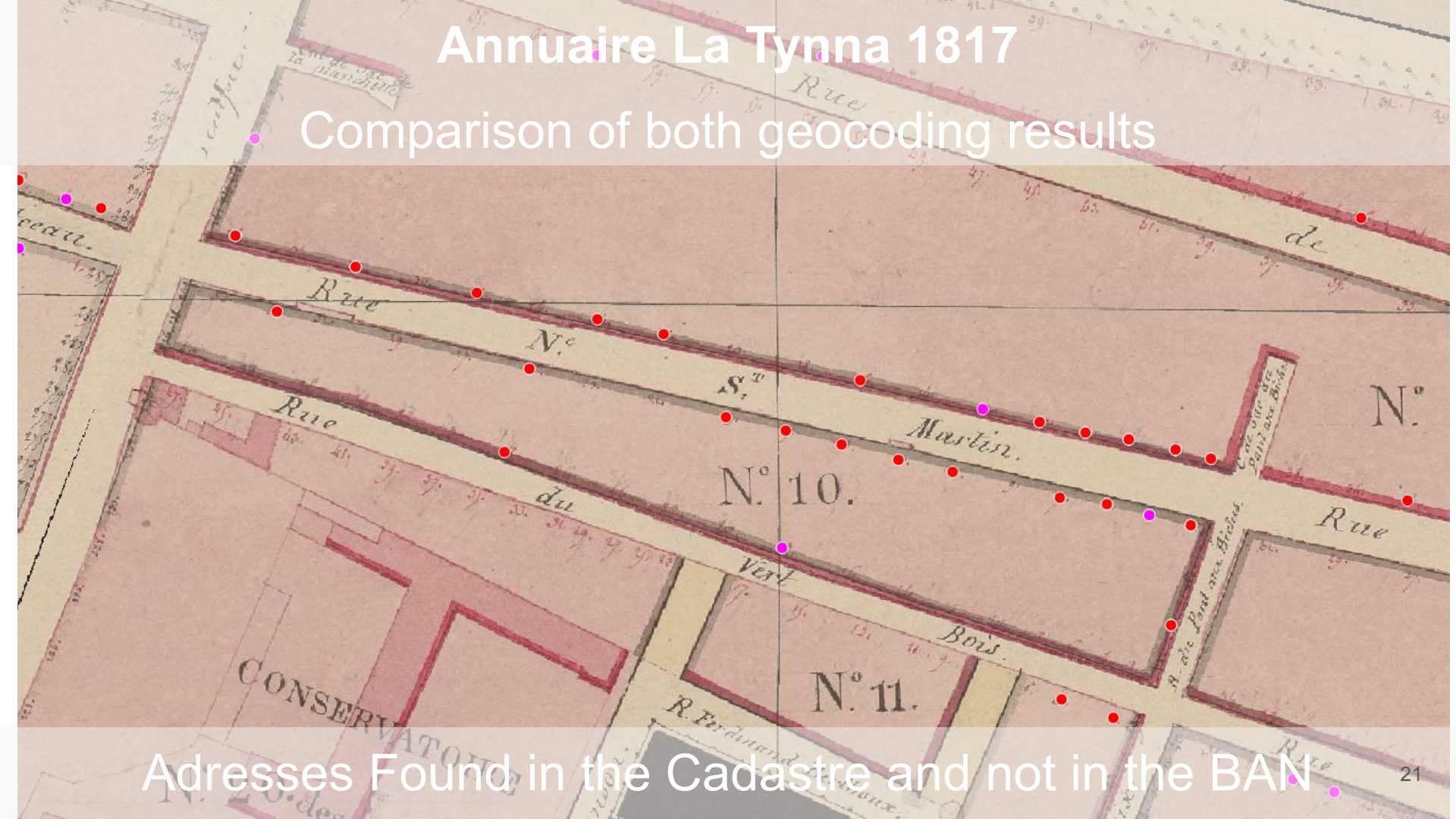
## Comparison of both geocoding results



# Annuaire La Tynna 1817

Comparison of both geocoding results

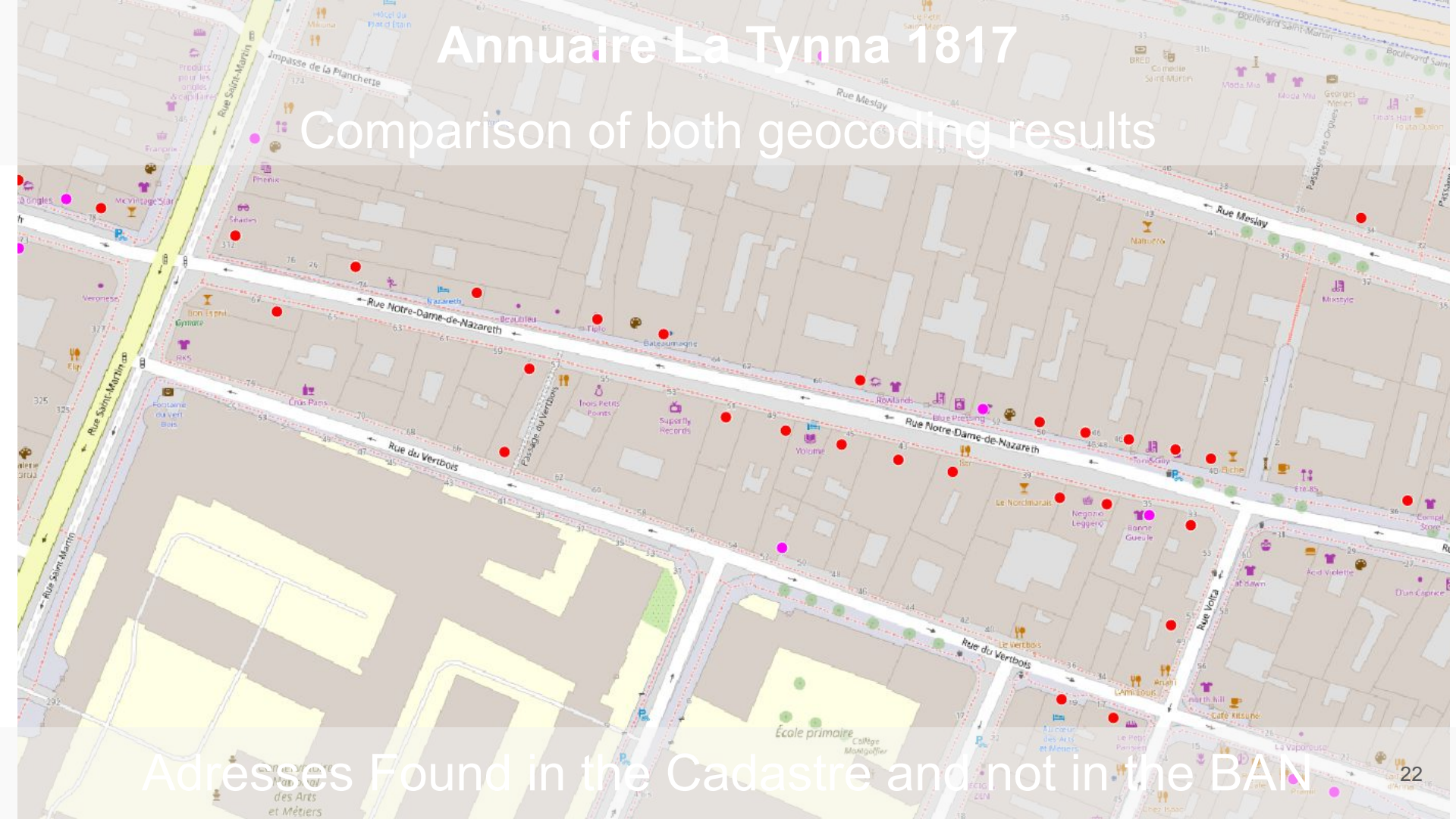
Adresses Found in the Cadastre and not in the BAN



# Annuaire La Tynna 1817

## Comparison of both geocoding results

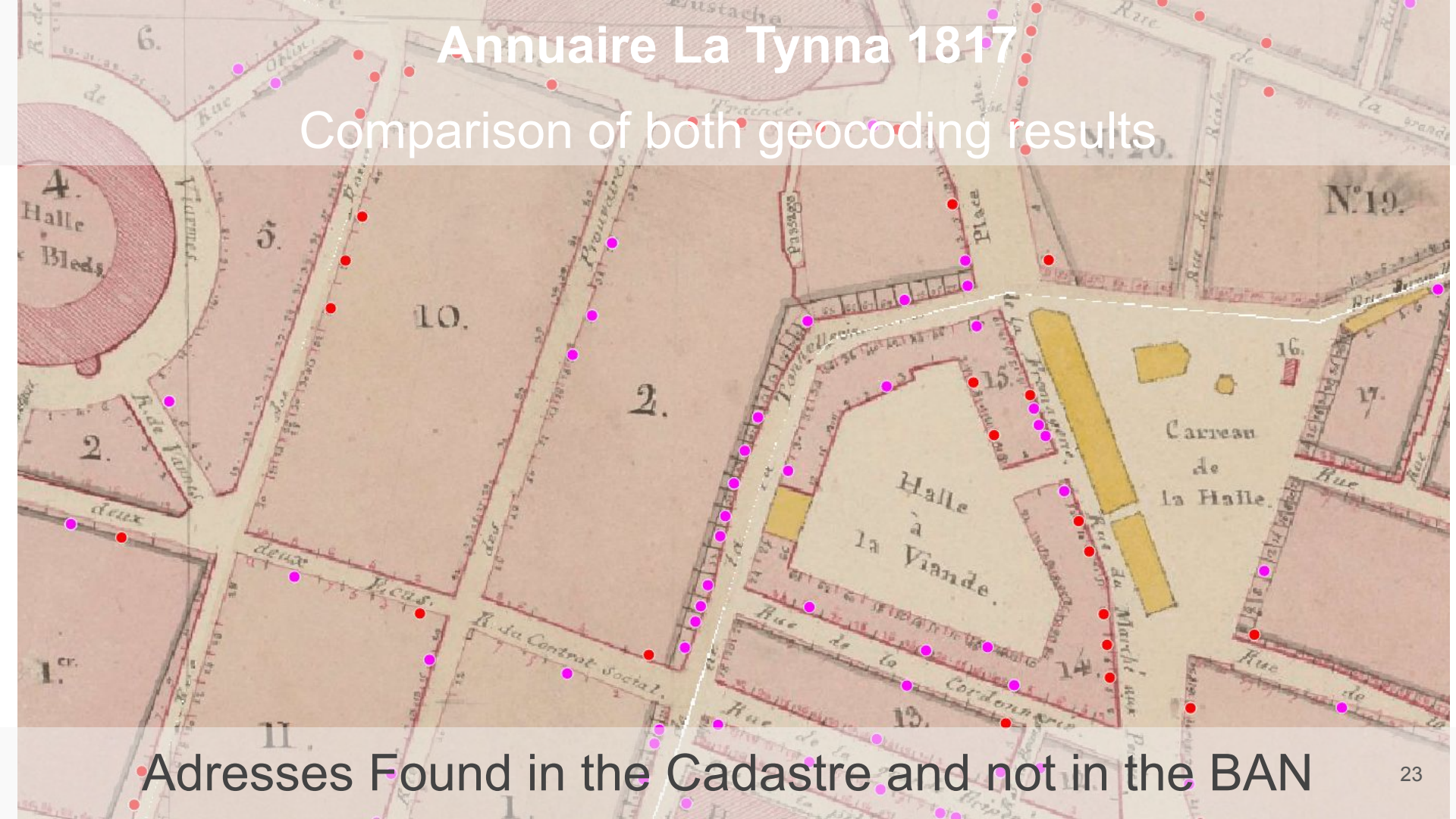
Adresses Found in the Cadastre and not in the BAN



# Annuaire La Tynna 1817

Comparison of both geocoding results

Adresses Found in the Cadastre and not in the BAN



# Annuaire La Tynna 1817

Comparison of both geocoding results

Adresses Found in the Cadastre and not in the BAN





# Annuaire Bottin 1837



Geocoded with modern data

Geocoded with Jacoubet Atlas

# Annuaire Bottin 1837



Geocoded with modern data

Geocoded with Jacoubet Atlas



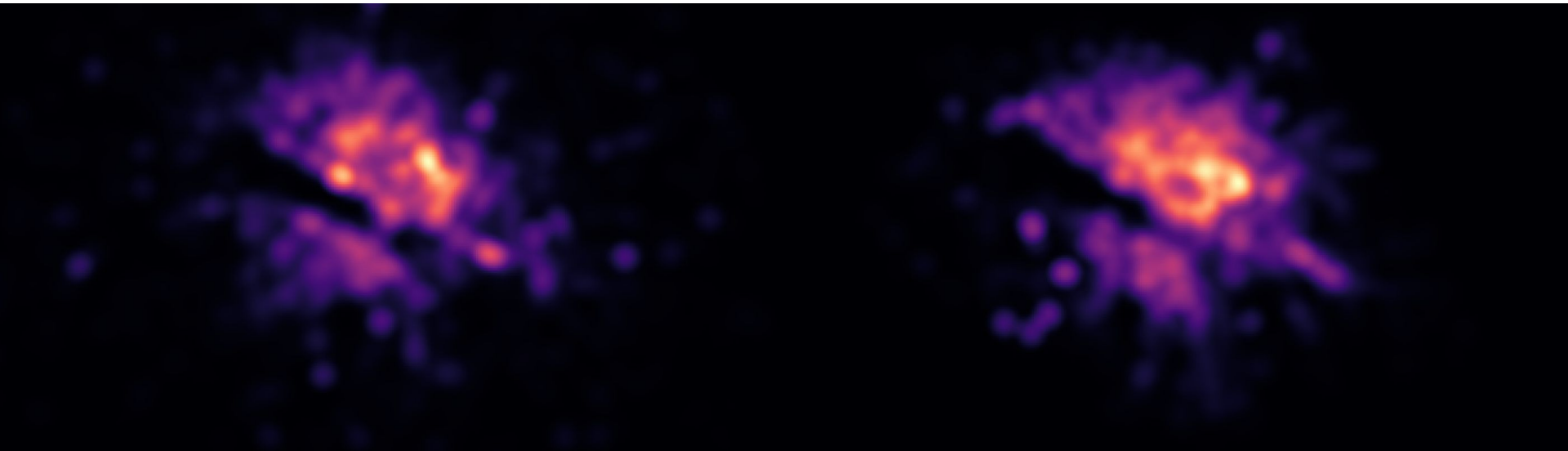
# Annuaire Didot 1853



Geocoded with modern data

Geocoded with Jacoubet Atlas  
and Correspondence table

# Annuaire Didot 1853

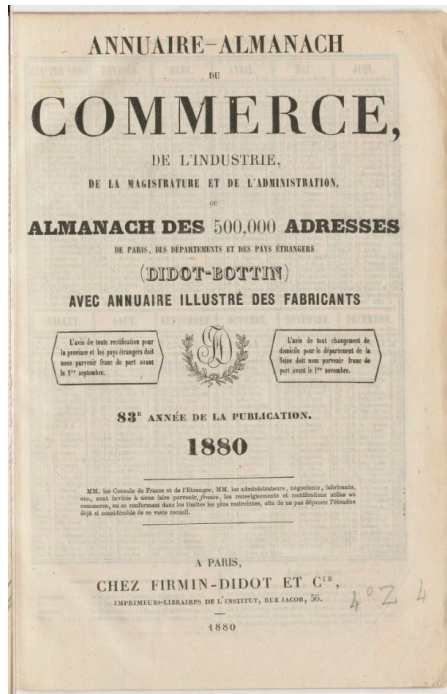


Geocoded with modern data

Geocoded with Jacoubet Atlas  
and Correspondence table



# Annuaire Didot-Bottin 1880



[Document in Gallica](#)



[Content extracted from SoDUCo](#)



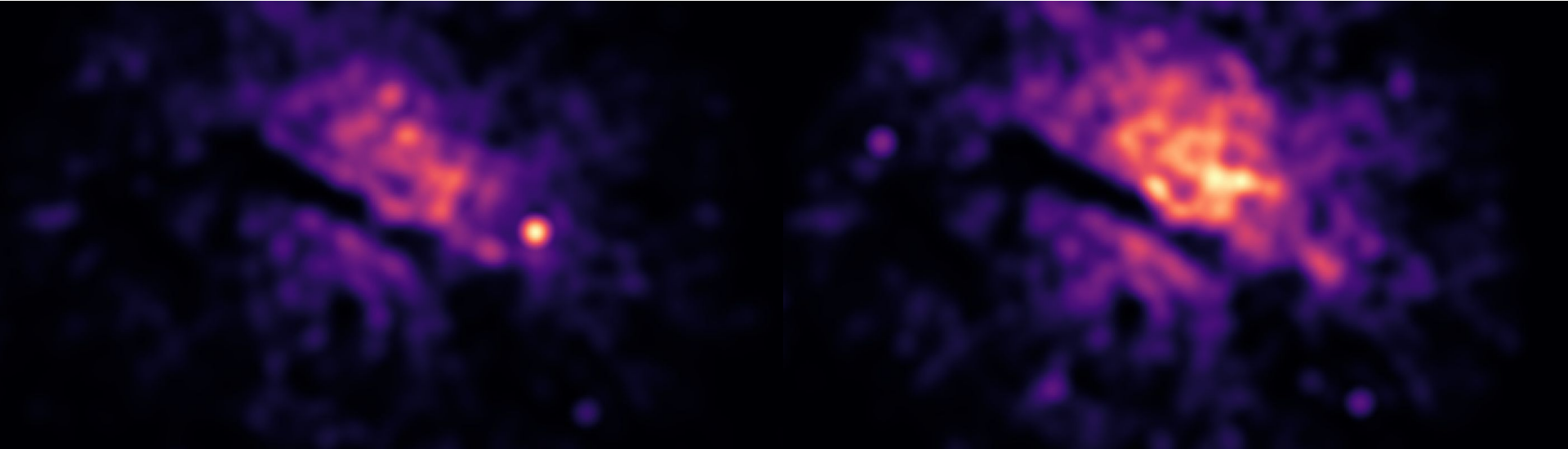
# Annuaire Didot-Bottin 1880



Geocoded with modern data

Geocoded with Atlas municipal

# Annuaire Didot-Bottin 1880



Geocoded with modern data

Geocoded with Atlas municipal

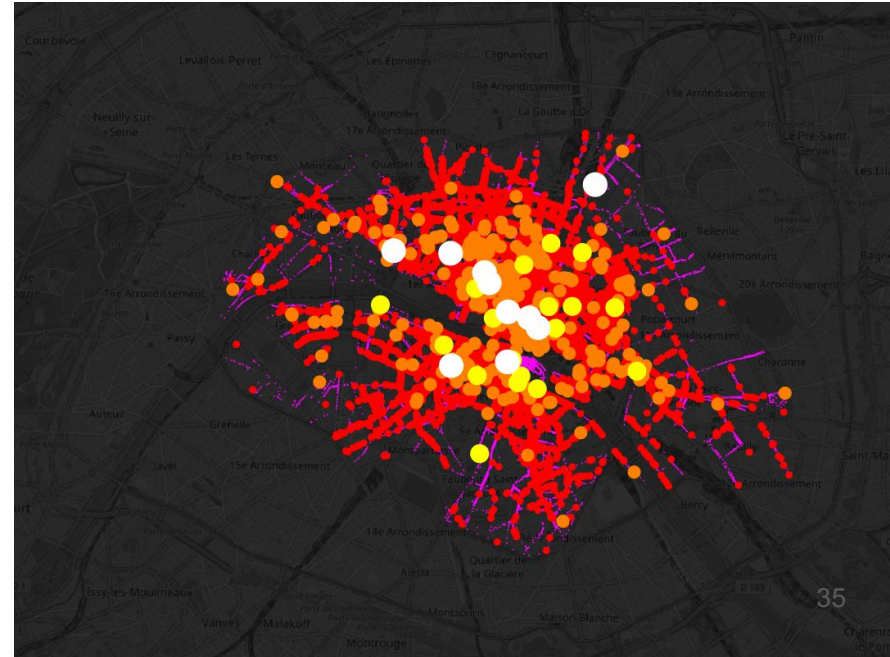
# Reversing the perspective

Addresses from the gazetteers are more or less found in documents

In the **cadastre**, for instance

most addresses are **not in the directory**

(19366 / 27219)



# Conclusions

Mapping **fine-grained historical data** requires **fine-grained historical gazetteers**.

Reconstructing address numbering is a **difficult task**:

- *Continuous changes over time* especially in Paris during the 19th century
- *Cadastrres & administrative maps* provide precious snapshots of this numbering
- *Merging non-cartographic sources* helps filling the gaps

Historical Gazetteers are also a proxy to study **urban morphogenesis**

A **cumulative approach** is necessary

Open source tools

Open data

# Thank You!

More info: <https://soduco.geohistoricaldata.org/>

