A detailed historical cadastral map of a section of Vilnius, Lithuania. The map shows a dense grid of property lots, many of which are shaded in yellow or green. Numerous lot numbers are visible throughout the map. A prominent feature is a large, irregularly shaped area shaded in light blue, labeled 'Ogrody' (Gardens) in a stylized script. Above this area, the word 'Synagogue' is written in a simple font. The map also shows various streets and alleys, with some names like 'Kamien' and 'Lekaysker' partially visible. The overall style is that of a historical survey map, with fine lines and a lot of numerical data.

# **Historical Cadastral Maps for Locating and Sizing Old Jewish Cemeteries**

**Jay Osborn  
Gesher Galicia, Inc.**

## ***European Jewish Cemeteries: An Interdisciplinary Conference***

**Vilnius  
October 2015**



# About Historical Cadastral Maps

- What is a (historical) cadastral map?
  - a legal map defining property boundaries, usually to support fair taxation
  - like plat maps in the US and similar maps all over the world today
  - following the Habsburg example, produced in some form by many European states from the early- to mid-19th century
- Where can historical cadastral maps be found?
  - paper: national archives and libraries in Europe; regional and local land survey offices; rarely in private collections
  - digital: websites of archives and libraries, as for paper maps; specialist map websites
- Why use cadastral maps to locate and/or size Jewish cemeteries?
  - many traditional sources of geographic location are imprecise (Yizkor books, memory maps, local residents)
  - many current and online sources are incomplete, and include some errors
  - few available sources precisely define cemetery boundaries

Historical cadastral maps have many of these same limitations, but often can supplement other sources and methods

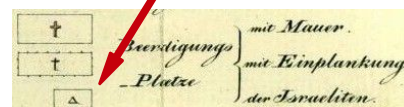
# (More) About Historical Cadastral Maps

- Historical cadastral map production:
  - coverage of much of Europe, including the entire Austro-Hungarian Empire
  - developed in at least three stages, from an initial field sketch accompanying the land survey, through intermediate sketches with improved accuracy, to one or more final states printed from lithographic plates
  - any of the map stages may be hand-modified from new field surveys in subsequent years, and new final-state maps were produced several times over 100+ years in some regions
  - any of the map types, from sketch to final/revised print, may be found in archives today; for some towns only the early types have survived
- Accuracy of the maps:
  - at 1:1500 to 1:5000 (commonly 1:2880), and produced under strict controls, these are usually the most precise and accurate maps available
  - at this scale, typical map fine line width is 1~2m
  - for lithographed maps, inaccuracy results from original survey errors, map production errors, paper distortion due to moisture and handling, etc.
  - georeferencing accuracy quoted by some sources is 15~20m, but relative accuracy to identifiable permanent geo features is much better
  - earlier-stage maps are much less accurate (field sketches can be spectacularly distorted), but still help by showing relative position and size of boundaries

# Jewish Cemeteries on Historical Cadastral Maps



On maps of the Austrian Empire...



...look for the triangle



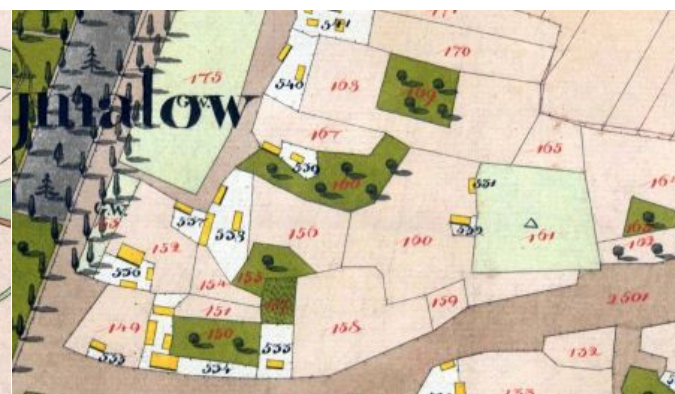
# "Classic" Representations of Jewish Cemeteries



Chortkiv 1859



Dębica 1849



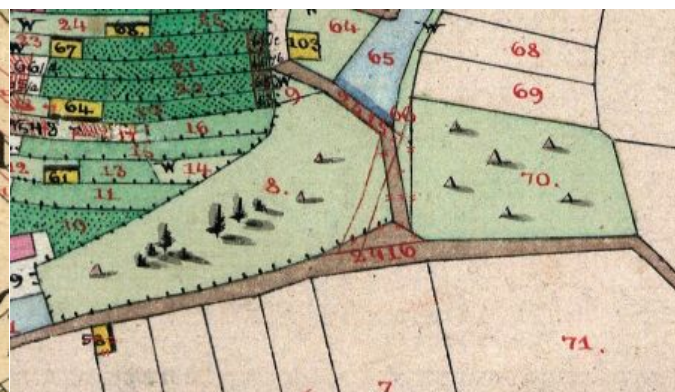
Hrymailiv 1828



Milevsko 1830



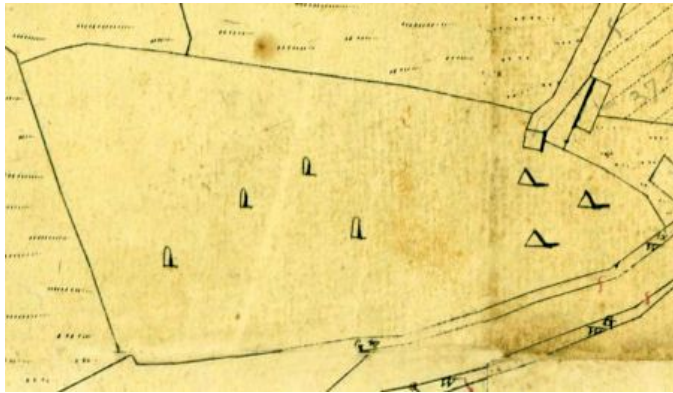
Leżajsk 1853



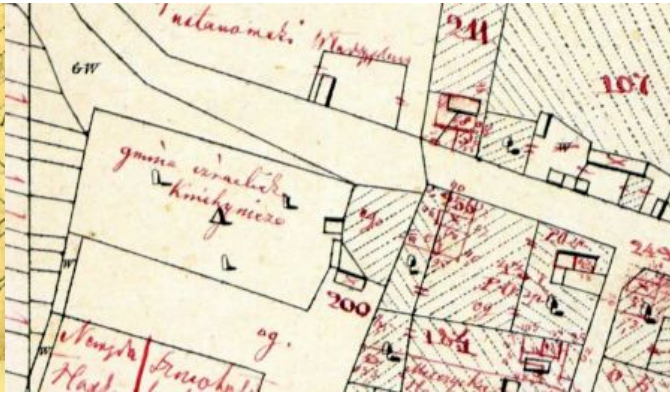
Głogów 1849



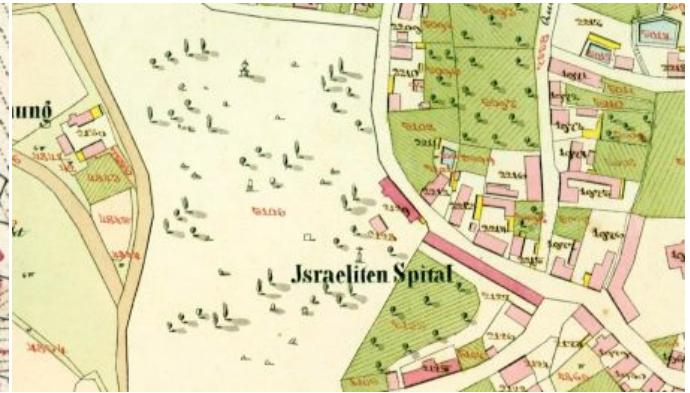
# Variant Representations of Jewish Cemeteries



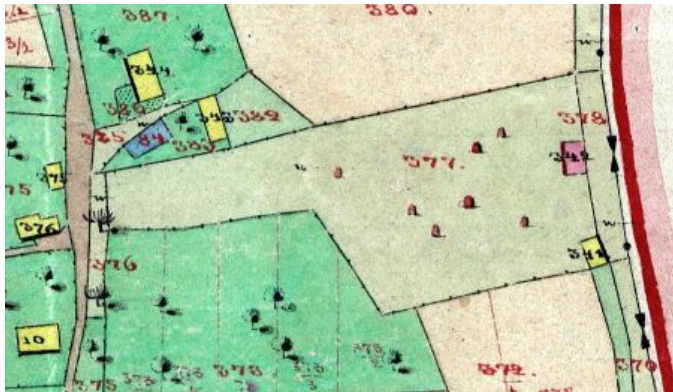
Bolekhiv 1878



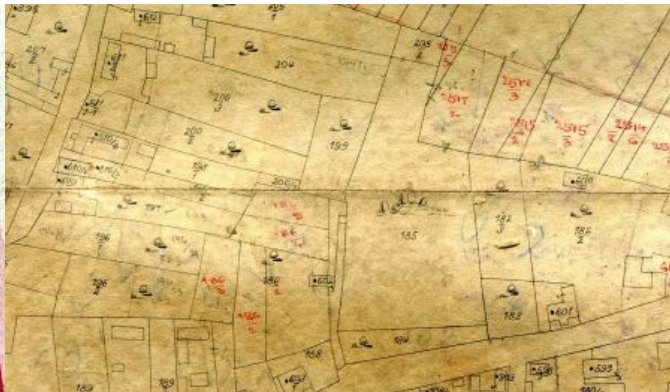
Knyahynychi 1876



Lviv 1853



Łańcut 1849



Hrymailiv nd (20th c.)



Żurów 1876

# Some Ways to Use the Maps in Cemetery Research

- Digital Geo-referencing and Overlays, Plus Measurement: GIS
  - formal and informal digital Geographic Information Systems have been available for personal computers for more than 25 years
  - GIS technology can be complex, but locating cemeteries and establishing approximate boundaries can use ordinary image manipulation software
  - output requirements for subsequent analysis depend on the end goal of the research; as guidance for ground measurements, GPS coordinates and visual references are likely sufficient

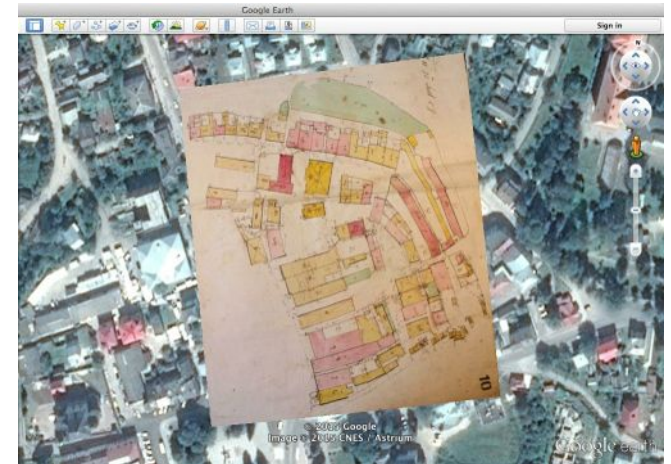
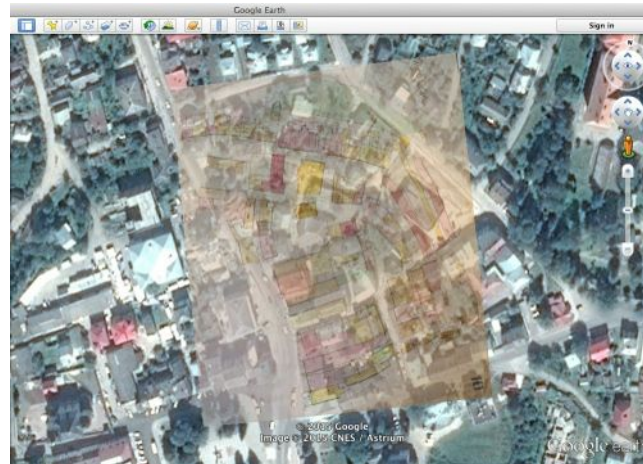
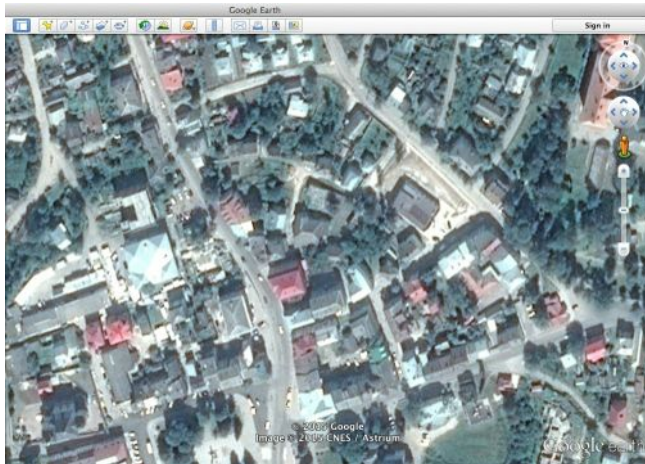




# Geo-Referencing Historical Cadastral Maps

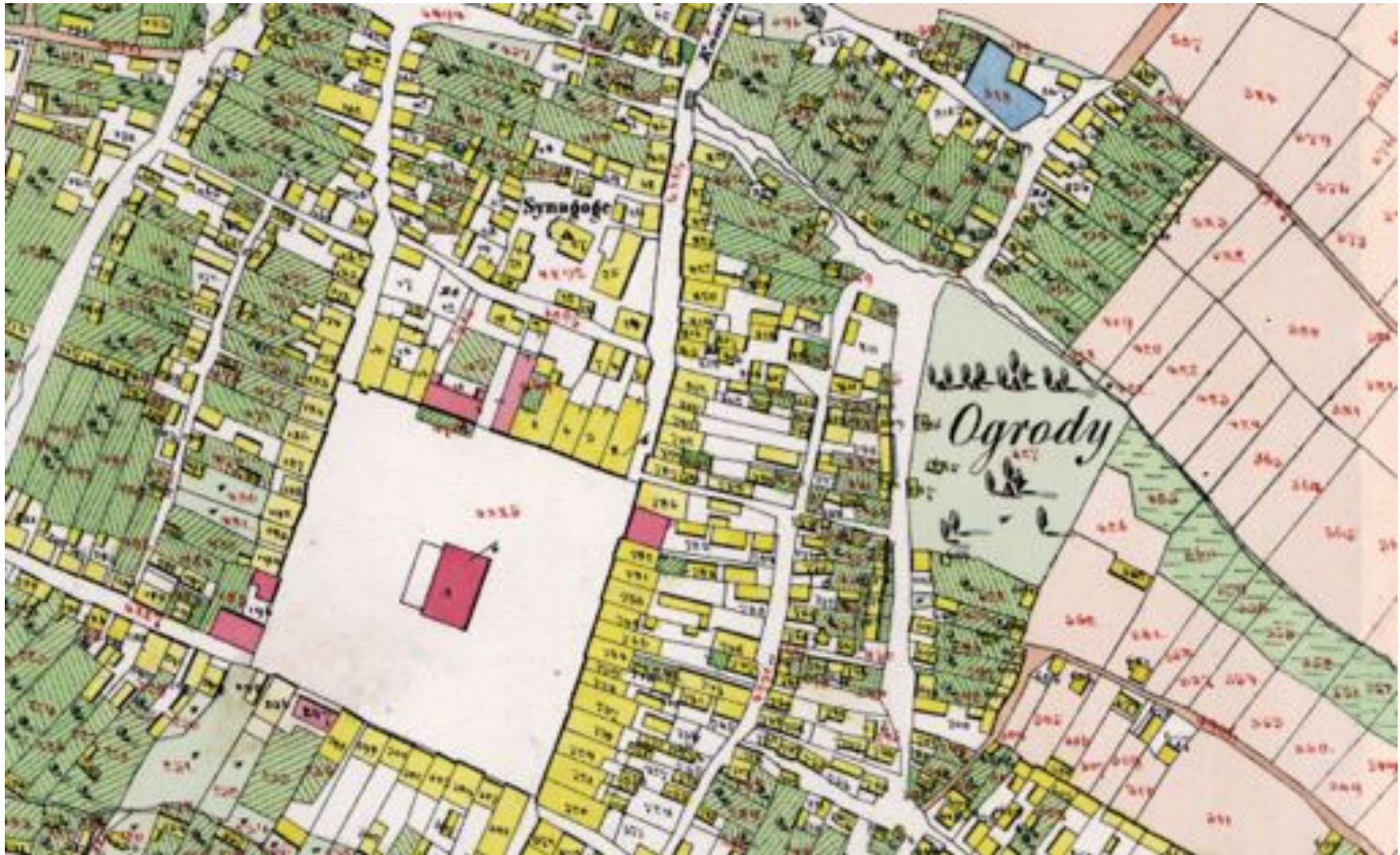


▲ Using the original map sheet corner geo-coordinates... Or visually ▼





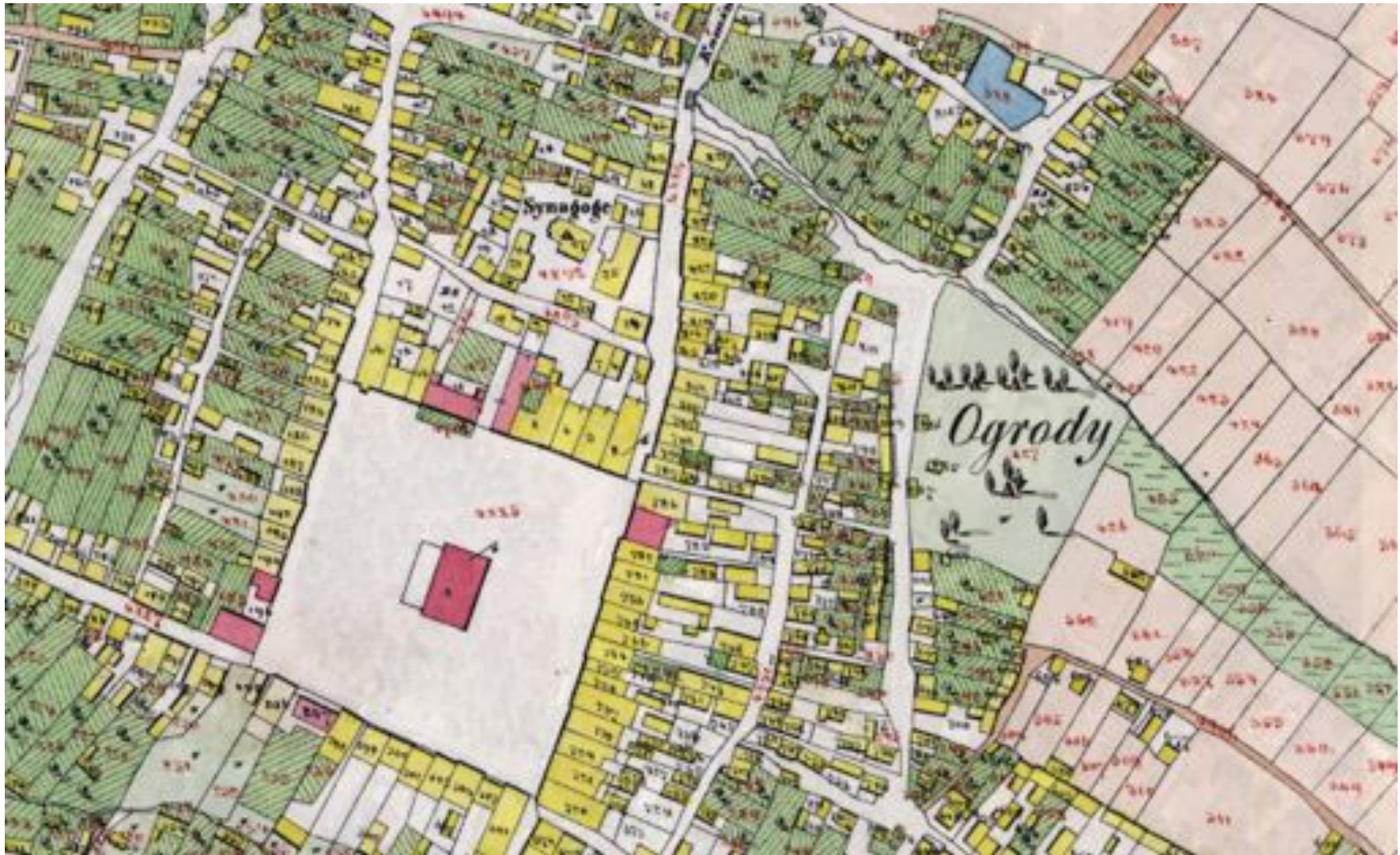
# An Example: Sokołów Małopolski 1853 on Google Maps



0% transparency



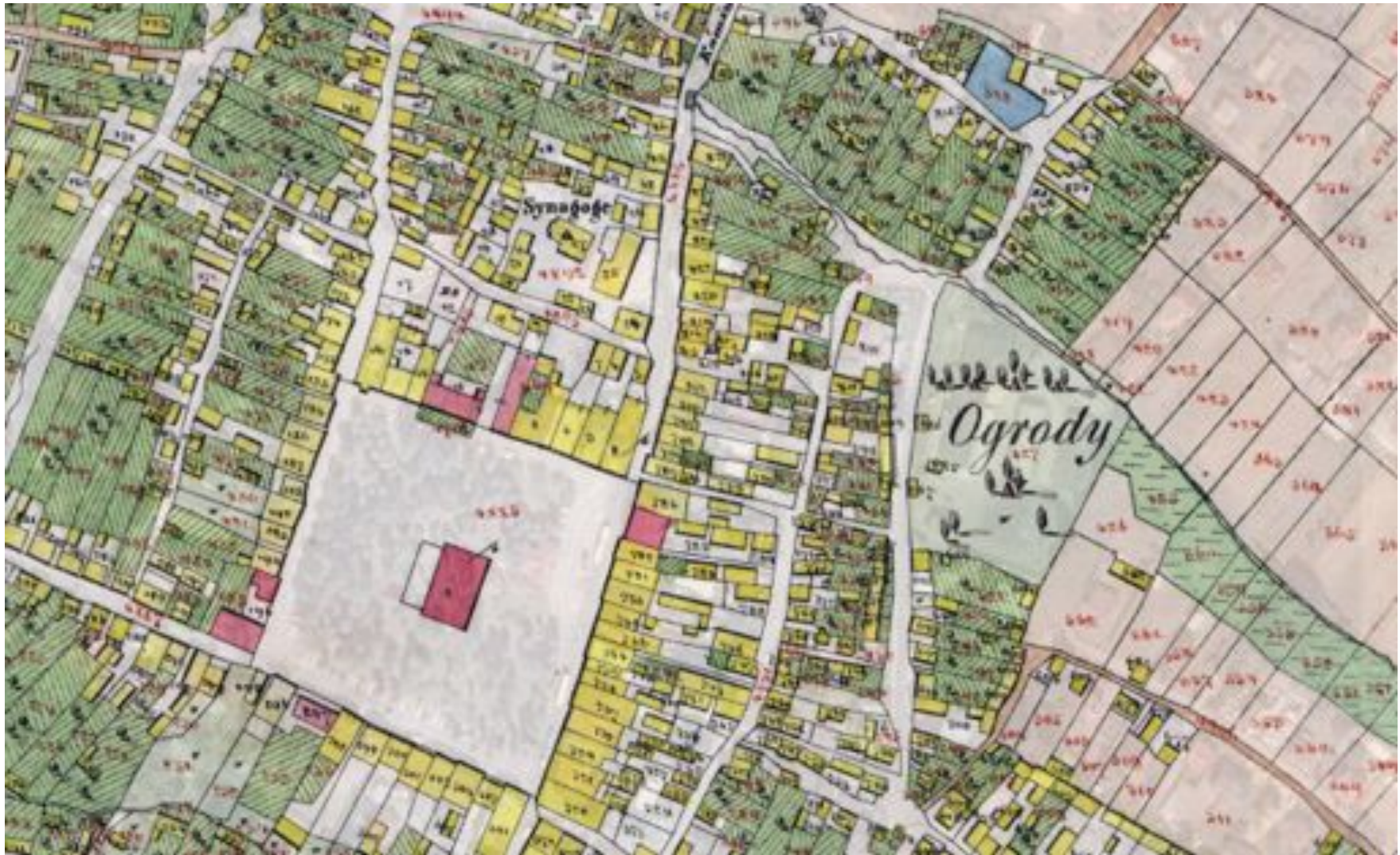
# An Example: Sokołów Małopolski 1853 on Google Maps



10% transparency



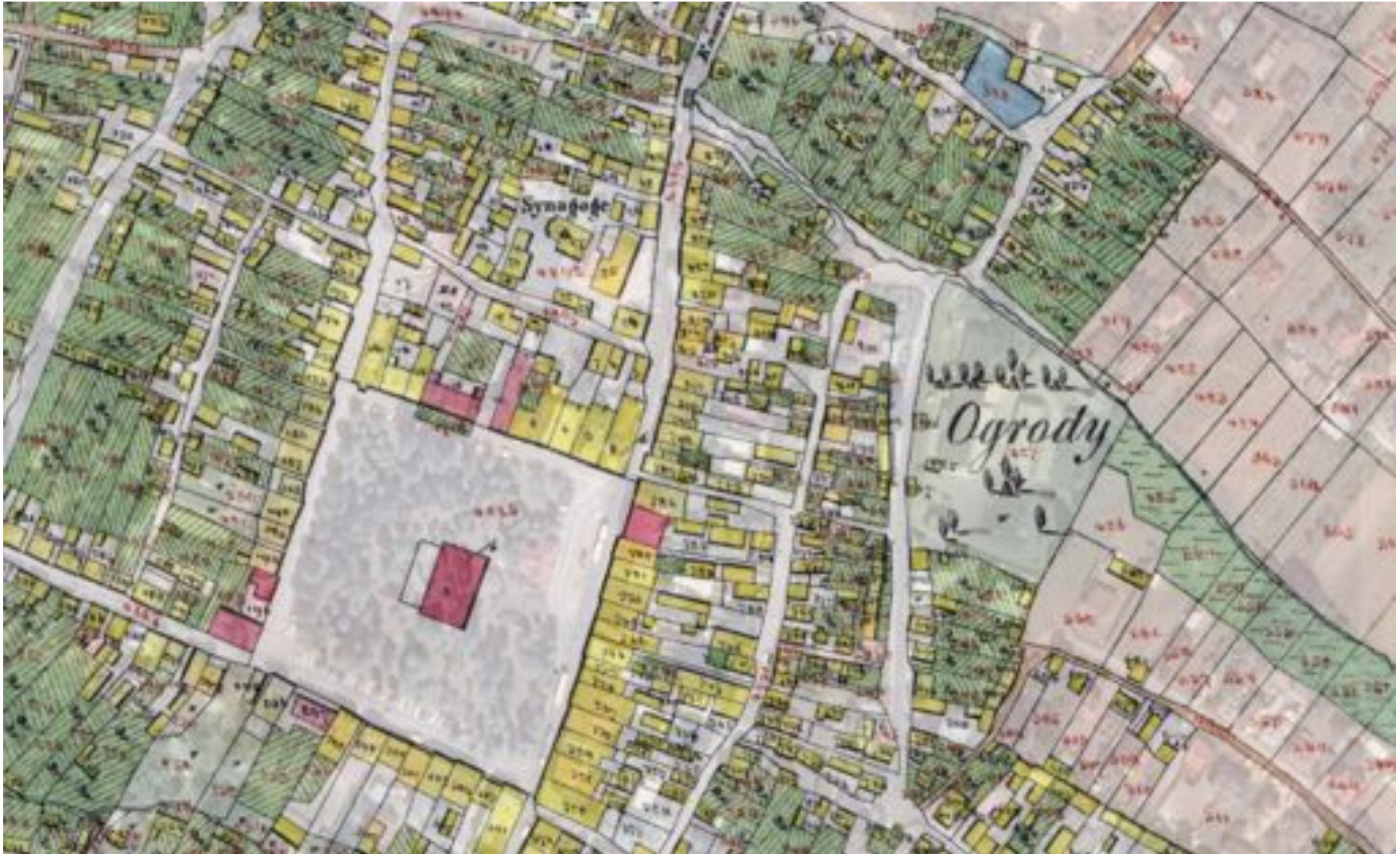
# An Example: Sokołów Małopolski 1853 on Google Maps



20% transparency



# An Example: Sokołów Małopolski 1853 on Google Maps



30% transparency



# An Example: Sokołów Małopolski 1853 on Google Maps



40% transparency



# An Example: Sokołów Małopolski 1853 on Google Maps



50% transparency



# An Example: Sokołów Małopolski 1853 on Google Maps



60% transparency



# An Example: Sokołów Małopolski 1853 on Google Maps



70% transparency



# An Example: Sokołów Małopolski 1853 on Google Maps



80% transparency



# An Example: Sokołów Małopolski 1853 on Google Maps



90% transparency



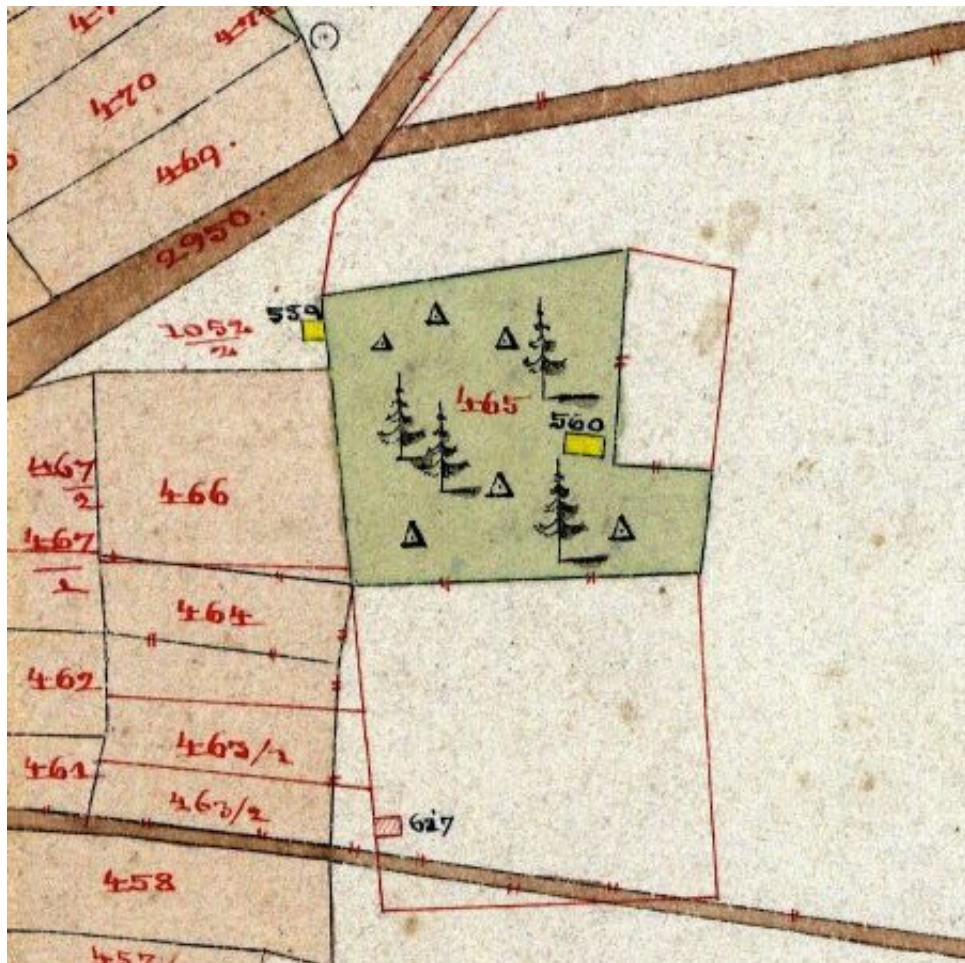
# An Example: Sokołów Małopolski 1853 on Google Maps



100% transparency



# What if Cemetery Boundaries Change?



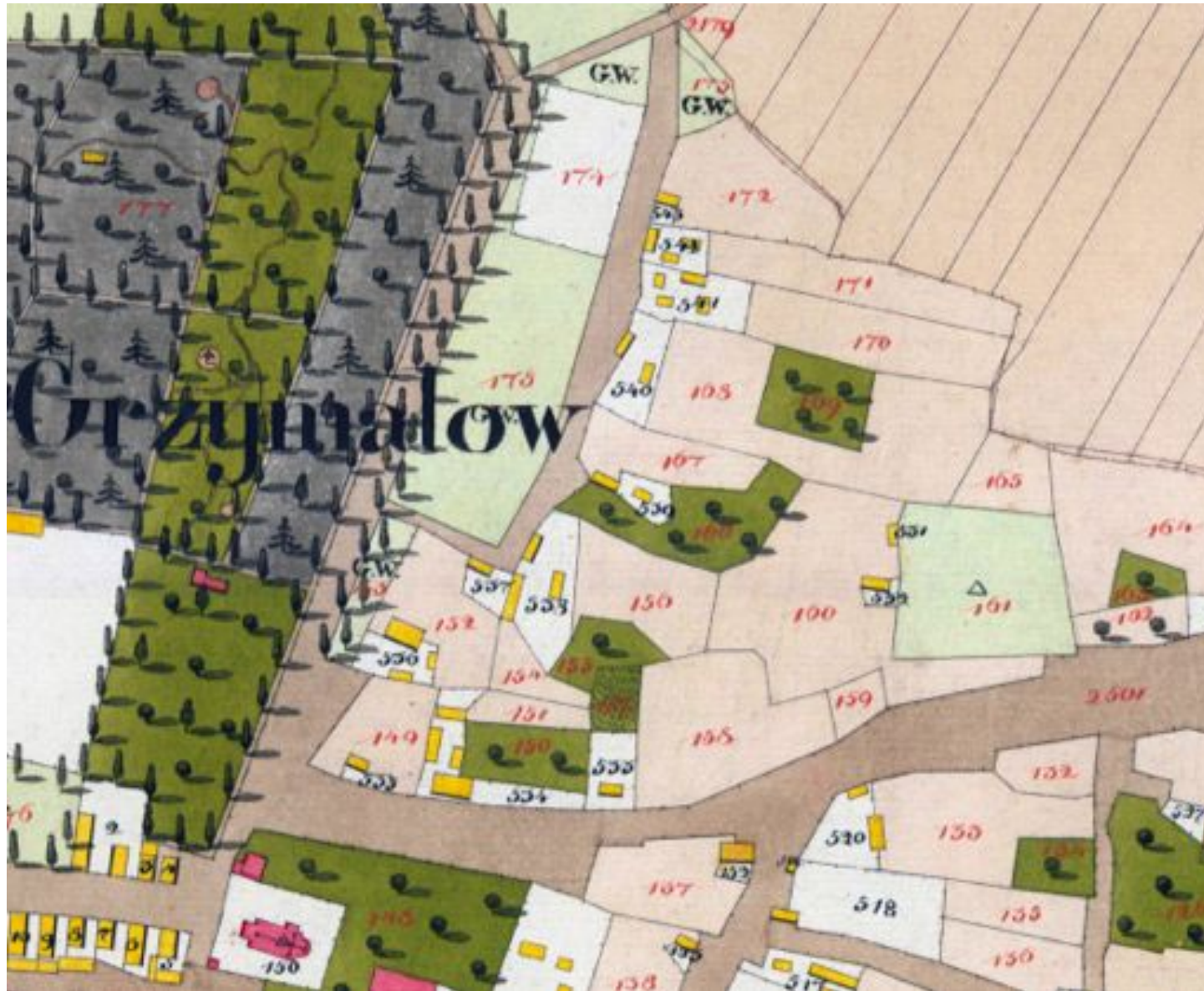
Ulanów 1853



Ulanów Bing



# Evolution of a Cemetery: Hrymailiv 3x on Bing Maps



Bing:  
1910:  
1861:  
1828: 100%



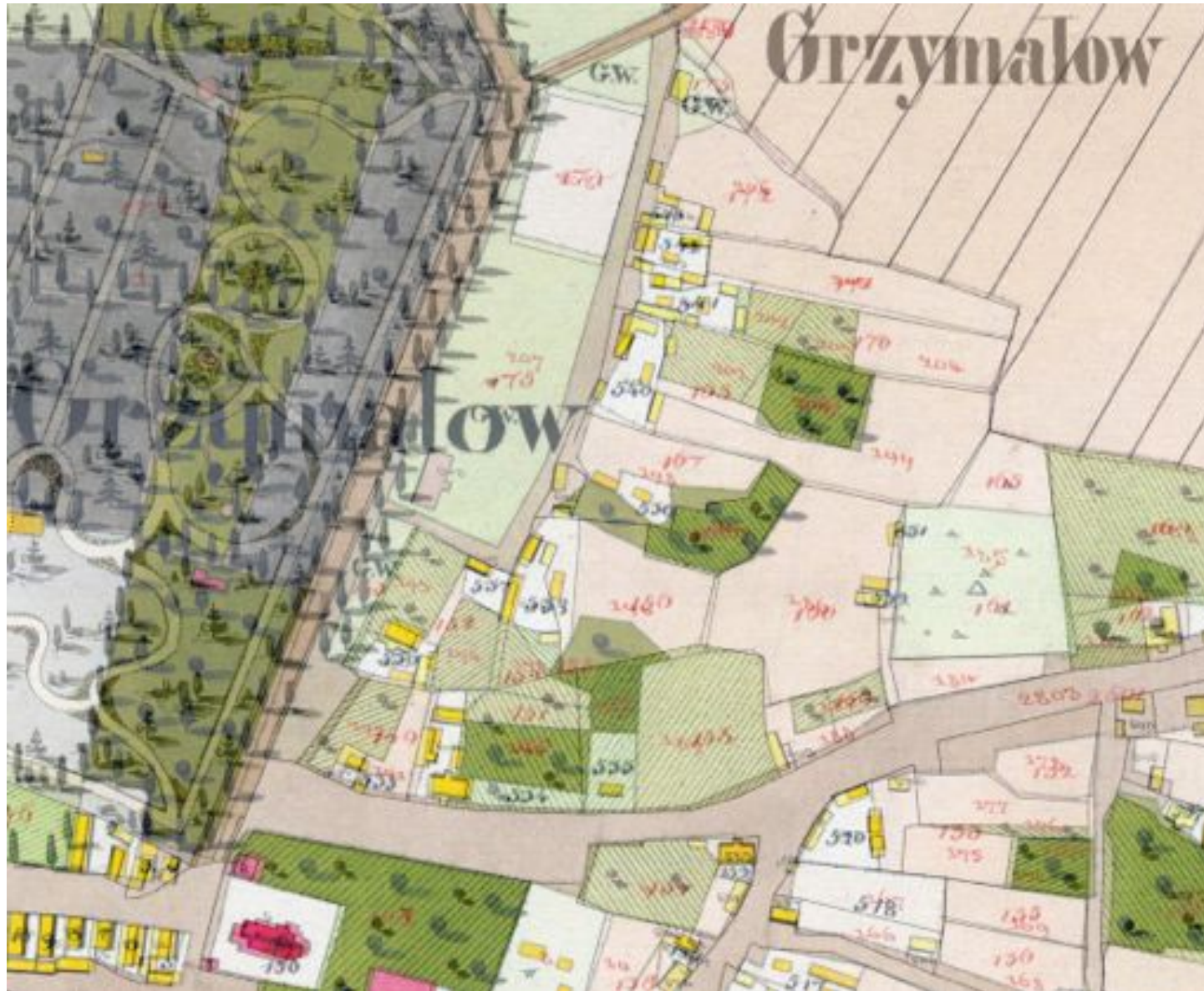
# Evolution of a Cemetery: Hrymailiv 3x on Bing Maps



Bing:  
1910:  
1861: 20%  
1828: 100%



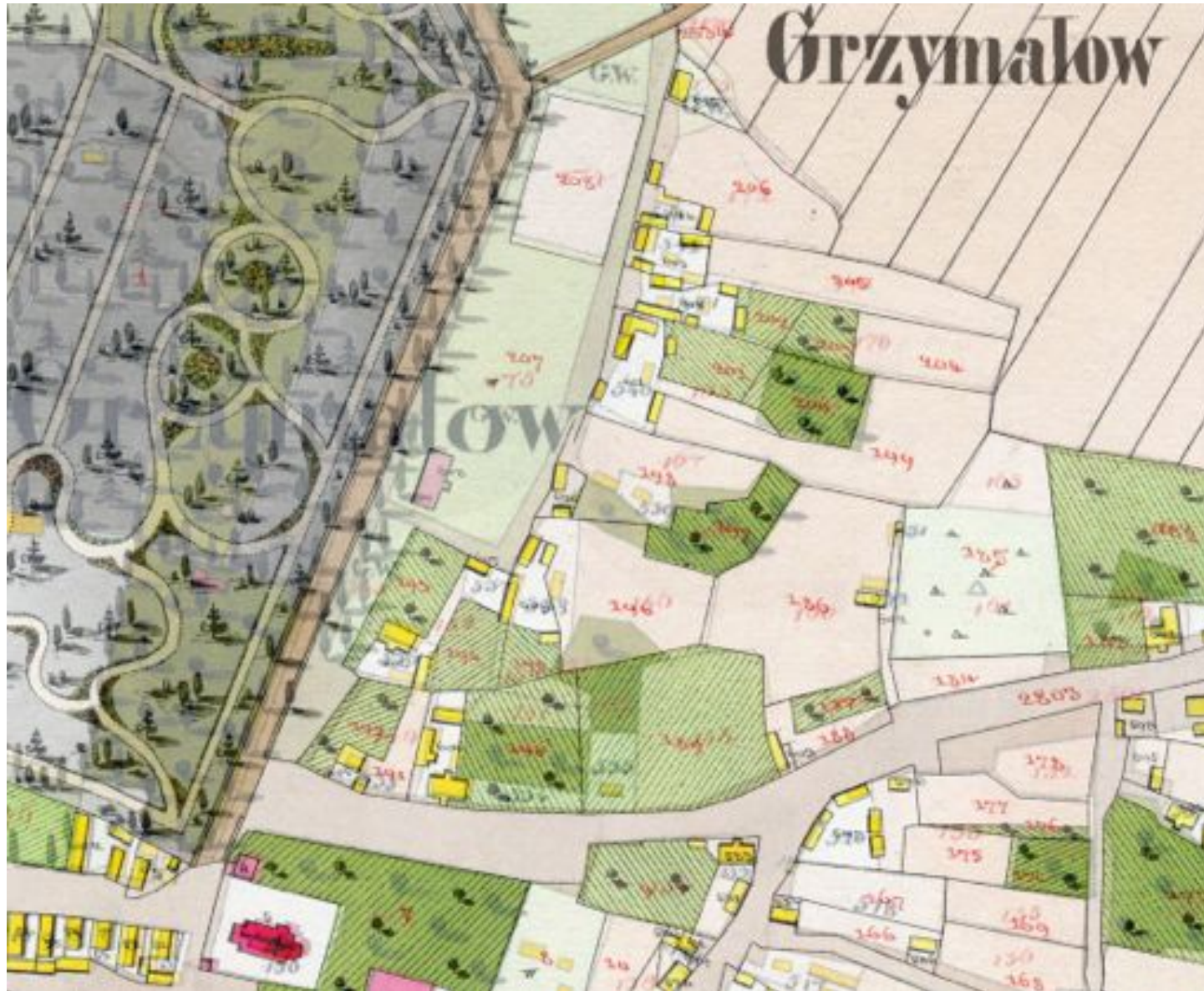
# Evolution of a Cemetery: Hrymailiv 3x on Bing Maps



Bing:  
1910:  
1861: 40%  
1828: 100%



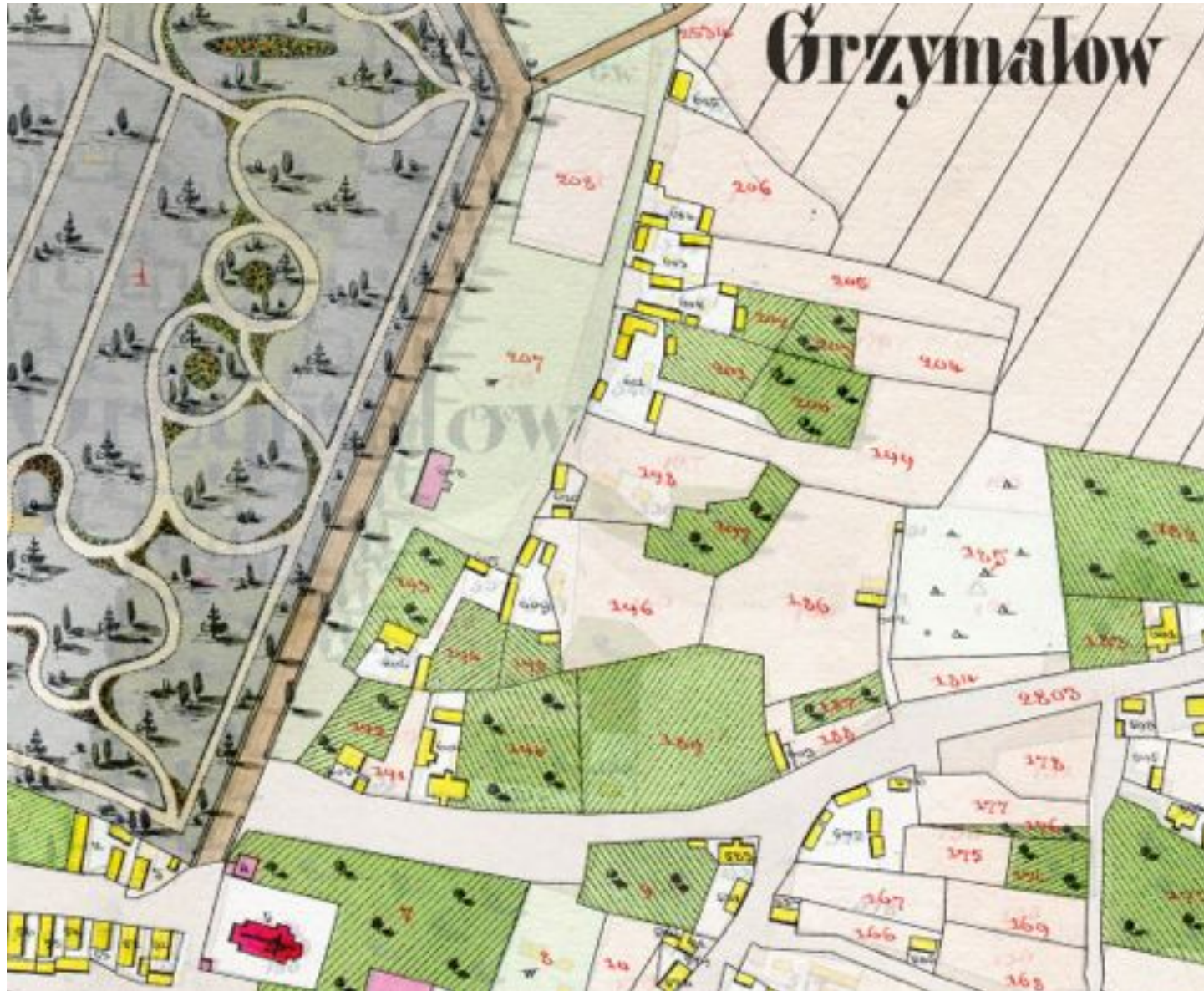
# Evolution of a Cemetery: Hrymailiv 3x on Bing Maps



Bing:  
1910:  
1861: 60%  
1828: 100%



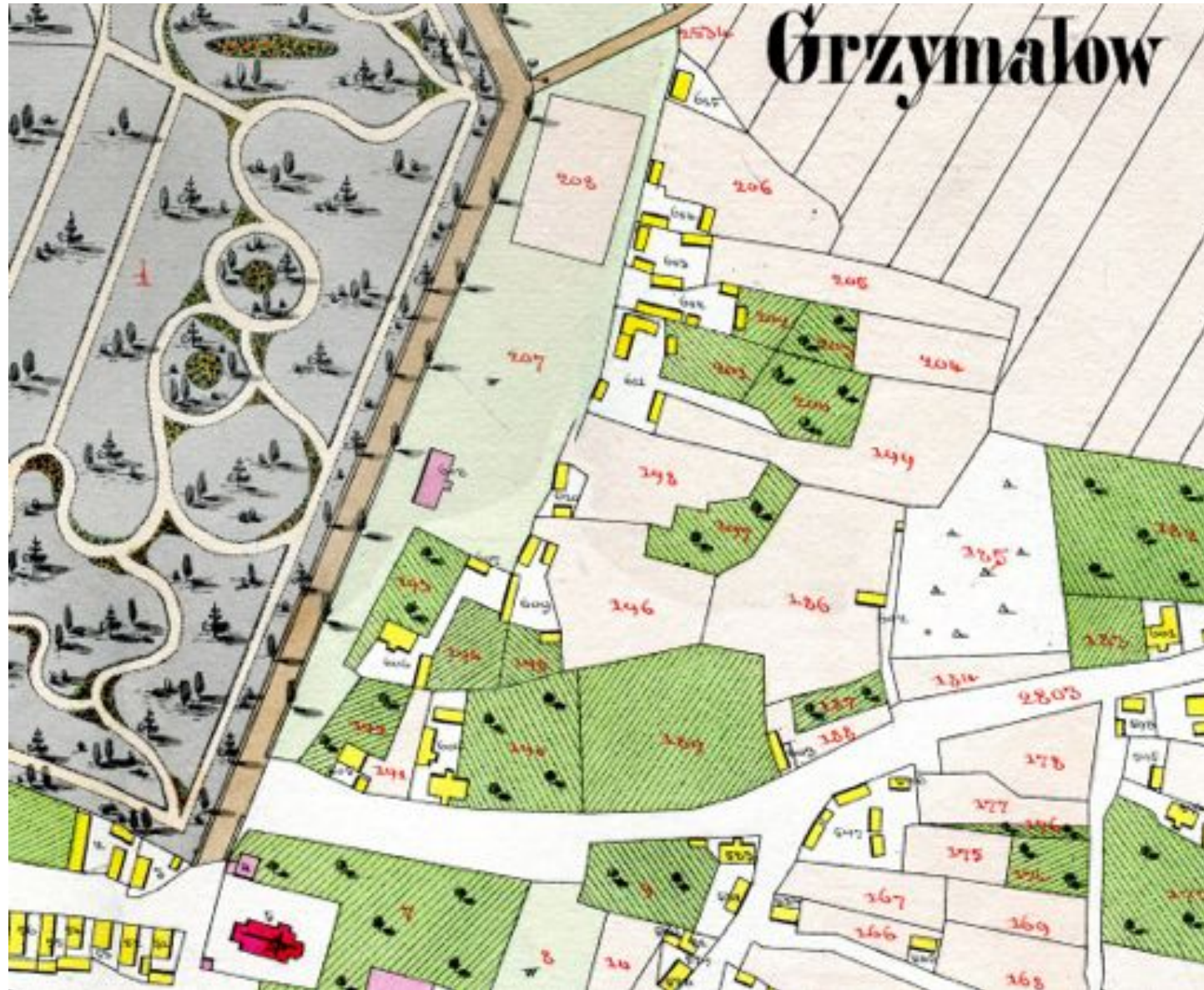
# Evolution of a Cemetery: Hrymailiv 3x on Bing Maps



Bing:  
1910:  
1861: 80%  
1828: 100%



# Evolution of a Cemetery: Hrymailiv 3x on Bing Maps



Bing:  
1910:  
1861: 100%  
1828:



# Evolution of a Cemetery: Hrymailiv 3x on Bing Maps



Bing:  
1910: 20%  
1861: 100%  
1828:



# Evolution of a Cemetery: Hrymailiv 3x on Bing Maps



Bing:  
1910: 40%  
1861: 100%  
1828:



# Evolution of a Cemetery: Hrymailiv 3x on Bing Maps



Bing:  
1910: 60%  
1861: 100%  
1828:



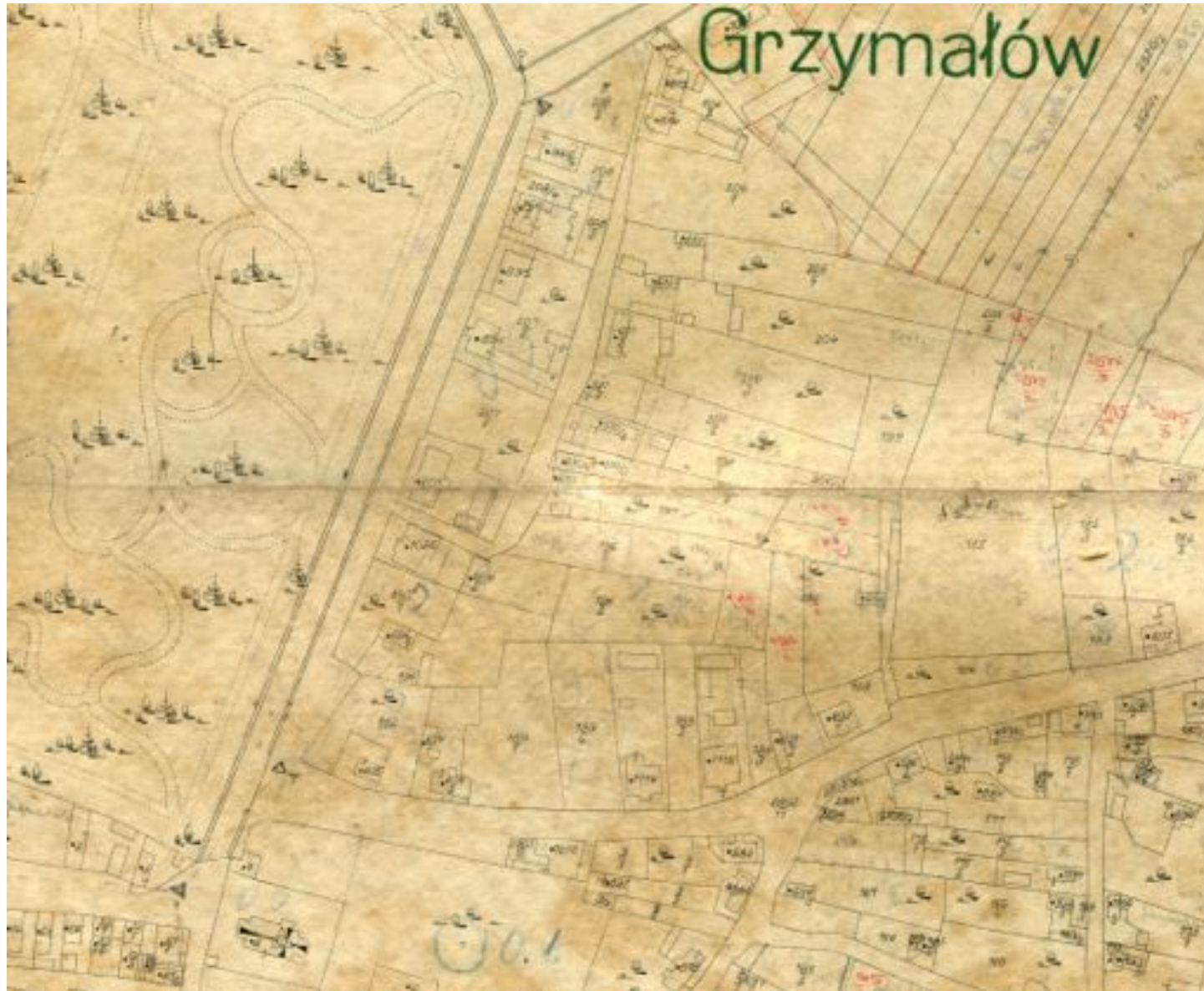
# Evolution of a Cemetery: Hrymailiv 3x on Bing Maps



Bing:  
1910: 80%  
1861: 100%  
1828:



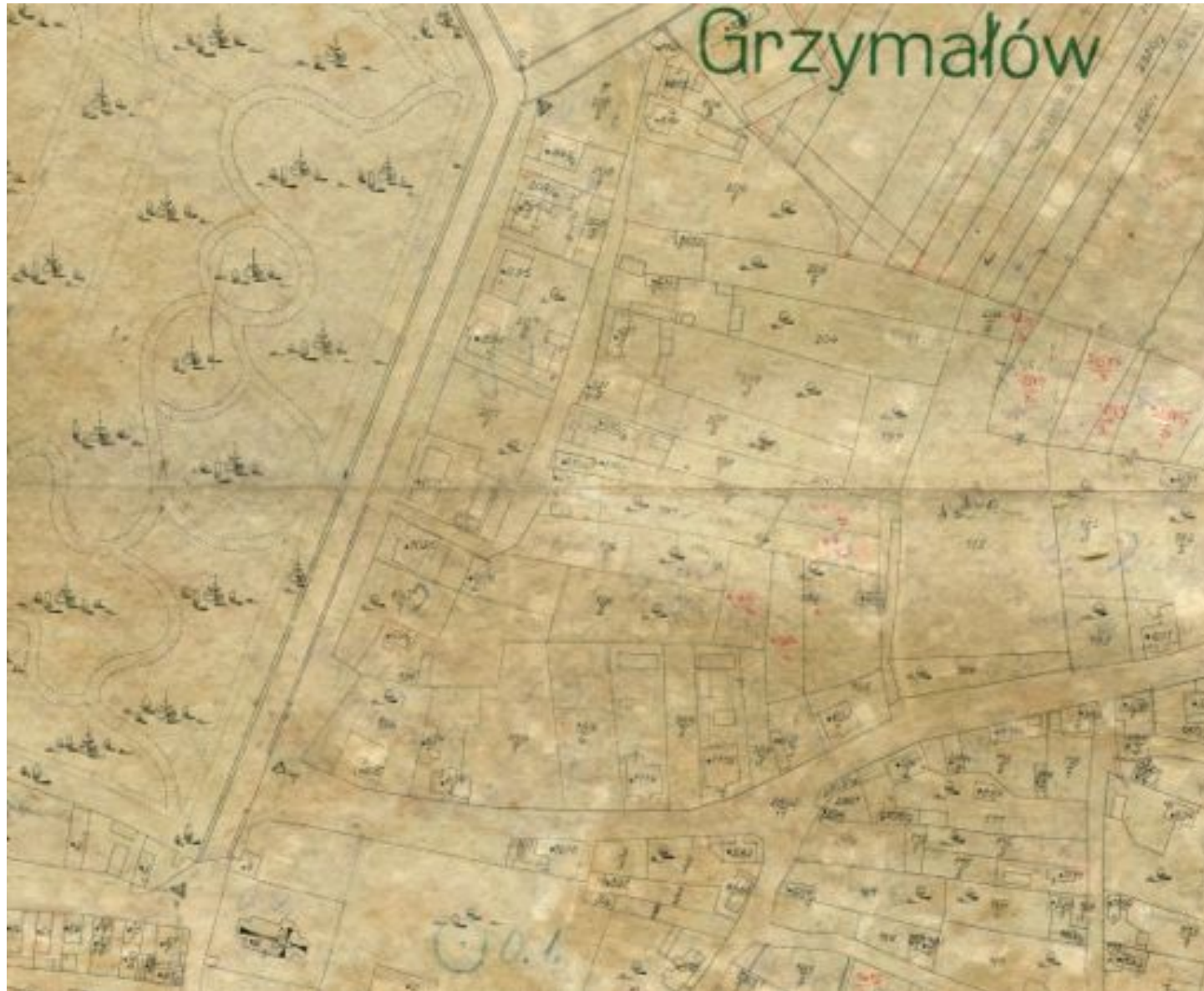
# Evolution of a Cemetery: Hrymailiv 3x on Bing Maps



Bing:  
1910: 100%  
1861:  
1828:



# Evolution of a Cemetery: Hrymailiv 3x on Bing Maps



Bing: 20%  
1910: 100%  
1861:  
1828:



# Evolution of a Cemetery: Hrymailiv 3x on Bing Maps



**Bing: 40%**  
**1910: 100%**  
**1861:**  
**1828:**



# Evolution of a Cemetery: Hrymailiv 3x on Bing Maps



**Bing: 60%**  
**1910: 100%**  
**1861:**  
**1828:**



# Evolution of a Cemetery: Hrymailiv 3x on Bing Maps



**Bing: 80%**  
**1910: 100%**  
**1861:**  
**1828:**



# Evolution of a Cemetery: Hrymailiv 3x on Bing Maps



Bing: 100%  
1910:  
1861:  
1828:



## If No Cadastral Maps Are Available: Alternatives



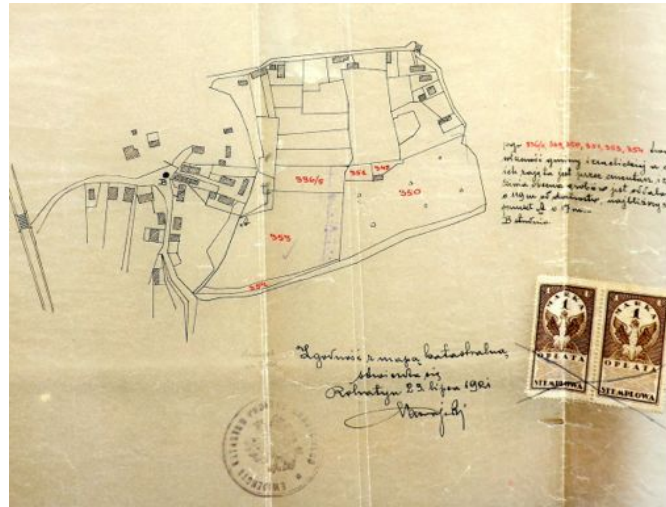
Kraków's New Cemetery (Miodowa), marked with a cross on the Austrian Empire's 3rd Military Survey (1869~1887, 1:25000)



# If No Cadastral Maps Are Available: More Alternatives



**1846 Cadastral Field Sketch**



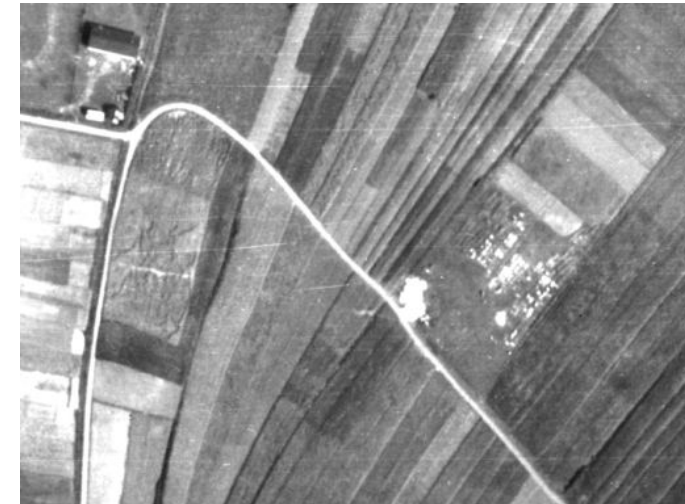
**1921 Cadastral Prelim Sketch  
Rohatyn Old Cemetery**



**1944 Luftwaffe Aerial Photo**



**2015 Wide-View Panorama  
Rohatyn New Cemetery**



**1944 Luftwaffe Aerial Photo**



# A Few Links

- Jewish Cemetery Locations:
  - US Commission for the Preservation of America's Heritage Abroad:  
<http://www.heritageabroad.gov/> -> Surveys
  - IAJGS International Jewish Cemetery Project:  
<http://www.iajgsjewishcemeteryproject.org/>
  - Virtual Shtetl:  
<http://www.sztetl.org.pl/> -> Towns
- European Cadastral Maps:
  - Mapire: Historical Maps of the Habsburg Empire:  
<http://mapire.eu/> -> Maps (includes Austrian military surveys)
  - Gesher Galicia:  
<http://maps.geshergalicia.org/> (maps)  
<http://maps.geshergalicia.org/references/> (background & references)
  - ICARUS: International Centre for Archival Research, working group on Cadastral Maps and Proceedings of 2013 Conference:  
<http://icar-us.eu/>  
<http://edizioni.sns.it/en/testi-online/pdf-scaricabile-284.html>