

HEADSTONE ROCK IDENTIFICATION

MEILEC, POLAND



By:
Kari Holk
Sophi Rutherford
Abigail Tolman

TABLE OF CONTENTS

• Introduction	3
• Question & Hypothesis	4
• Methodology	5
• Greywacke Sandstone	7
• Yellow Sandstone	8
• Red Sandstone	9
• Conglomerate	10
• Results	11
• Cautionary Conclusion & Limitations	12
• References & Sources	13
• Acknowledgements	14

INTRODUCTION

Our research focuses on recovering and identifying unmarked gravestones in Meilec, Poland (1), by categorizing them based on rock type and documenting our findings in a catalog. Through this process, we aim to provide tangible examples of rock identification methods while assisting Scott Genzer and his team in reconstructing fragmented headstones. By combining geological analysis with historical preservation and knowledge (3), our work contributes to piecing the fragments of headstones back together and reuniting them at the Old Jewish Cemetery in Mielec, Poland.(4)

QUESTION

What is the best way to identify the headstone fragments from the Old Jewish Cemetary, Meilec, Poland, to other broken headstones in the area?

HYPOTHESIS

We predict categorizing the headstone fragments by rock type would be the best method of matching fragments to other fragments of a headstone.

METHOD



Gathering Data

We received high-quality images from Scott Genzer of headstone fragments that need to be matched with other fragments. We gathered 15 images to examine.



Distinguished Rock Types

1. Observe the Color
2. Examine the Texture
3. Look for Weathering Patterns
4. Identify Special Features
5. Compare with known examples



Observations

Sandstone: Reddish, yellow, or grey with a uniform color, texture or layering. Sandstone will look and feel like sandpaper.

Conglomerate: Varies widely but often a mix of brown, grey, or reddish stones due to the diverse rock fragments it contains. There will be large rocks in smaller sediment like a mini cobbled street.

Greywacke Sandstone



Color: Dark grey to greenish due to clay and volcanic rock fragments.

Texture: Rougher and less uniform texture

Composition: A mix of quartz, feldspar, and rock fragments.



Identification: Newly broken areas will show a grey and brown rock color. It is best to look for the most recently exposed area to determine the original color and texture of the fragment.

Weathering Patterns: Pebbles may protrude over time as the cement erodes, giving it a bumpy surface.

Yellow Sandstone

Color: Light yellow to golden due to iron oxide in a hydrated form (limonite).

Texture: Smooth to slightly grainy, often well-sorted with similar grain sizes.

Composition: Mostly quartz with some feldspar and iron minerals.

Identification: The freshly broken areas will expose a more tan and yellow color.



Red Sandstone

Color: Reddish or rusty due to iron oxide (hematite).



Texture: Often smooth but may have visible layers.

Composition: High quartz content with iron minerals giving it a reddish hue.

Identification: These will have a more uniform reddish or rust color both on the inside and outside.



Conglomerate

Color: Varies in color, often a mix of browns, grays, reds, or tans

Texture/Composition: They feel rough and bumpy because they are made of large, smooth pebbles or rock chunks stuck together in a finer material.



RESULTS

Our findings indicate that there are only a few distinct types of headstones in the Old Jewish Cemetery in Mielec, Poland. After analyzing fifteen images, it became clear that most of the fragments were made of sandstone—as predicted—and likely originated from the same source (or the same quarry, from the same geologic unit). To create tangible categories for the project team, we narrowed our focus to different types of sandstone, while also including a conglomerate that we propose is not a headstone but rather a paver, bench, or part of the cemetery. By identifying these subcategories and presenting the data behind our conclusions, we aim to simplify the process of matching the fragments by reducing the number of possibilities.



CAUTIONARY CONCLUSIONS AND LIMITATIONS

Acknowledgments are due that our team does not consist of scientists and has no certified background in geology, mortuary sciences or related field pertaining to this subject.

Our team are not able to view the fragments in person or conduct any type of geological test to confirm our findings. With this as a severe limiting factor, we can only base our assumptions on indirect observation alone.

REFERENCES & SOURCES

(1) Genzer, S. J. (n.d.). Matzevot Melitz: Tombstones from the Old Jewish Cemetery of Mielec and the New Jewish Cemetery of Mielec. (C. Z. Spiegel, Trans.).

(2) Gale, T. (2007). Quarry identification for Titanic headstones in Nova Scotia. Gale Academic OneFile.

(3) Kukwa, M., & Jabłońska, A. (2023). Lichens on sandstone tombs in Jewish cemeteries in Poland. *Geografiska Annaler: Series A, Physical Geography*.

<https://doi.org/10.1080/00393630.2023.2174396>

(4) Kowalski, J. (2023). Jewish cemeteries after WWII and preservation. DOAJ.

(5) Rohatyn Jewish Heritage. (n.d.). Jewish gravestones in Rohatyn, Ukraine: Written in stone. Rohatyn Jewish Heritage.



ACKNOWLEDGEMENTS

We acknowledge the professional assistance from Dr. Kaatje Kraft and her wide breadth of geological knowledge. We would also like to thank Scott Genzer for his inspiration and taking images of the fragments. We also gained better knowledge from his book. We would also like to extend thanks to Josie Smith, Athena Simons and Josh Nelson for reviewing our project.

