An approach to create rock / cliff drawing analytically

Target
Existing rock drawings and it's components
Existing algorithms for the components
Altered (and new) algorithms
Tests & re-compositions

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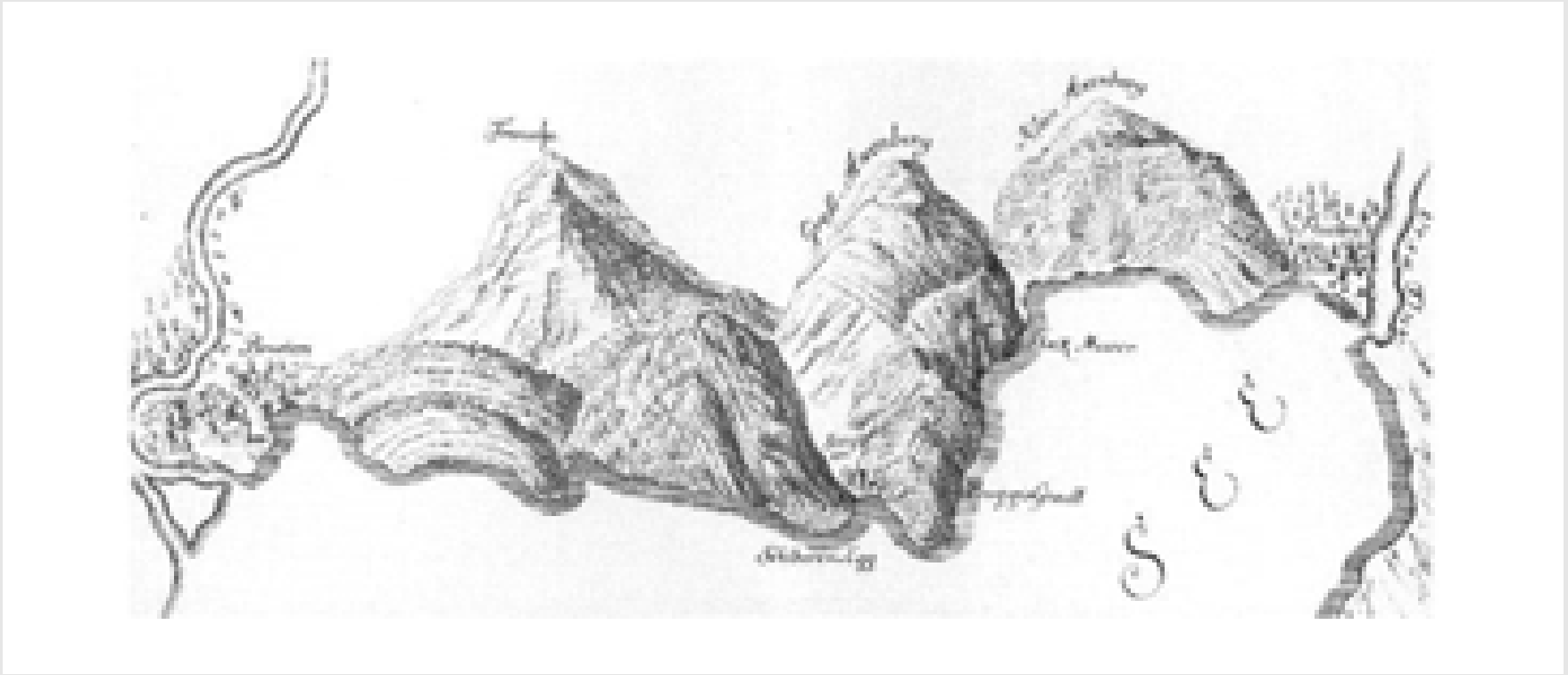
Target

- Analyse rock drawing
- Programming technique
  - Create non-interactive programs
  - Raster techniques
  - Step-by-step procedures, work with pipe
- Test and discuss algorithms
- Compose components
- (Work in progress: Discuss compositions)

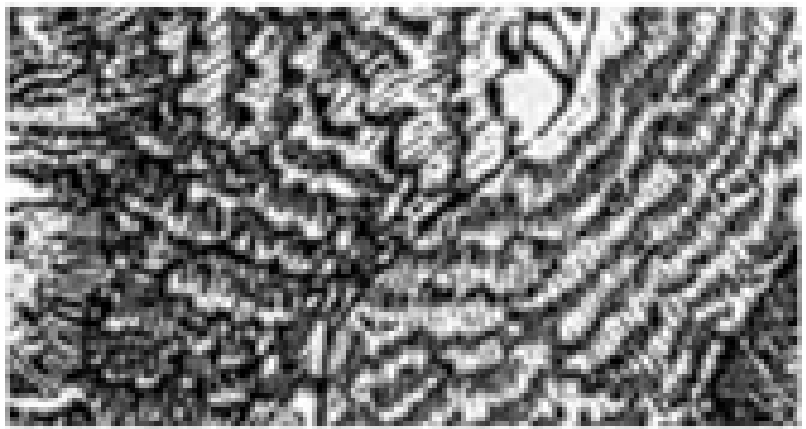
Existing rock drawings

- Early rock drawings
  - Mull-hill's



Existing rock drawing

- 19. Century
  - Orthogonal projection

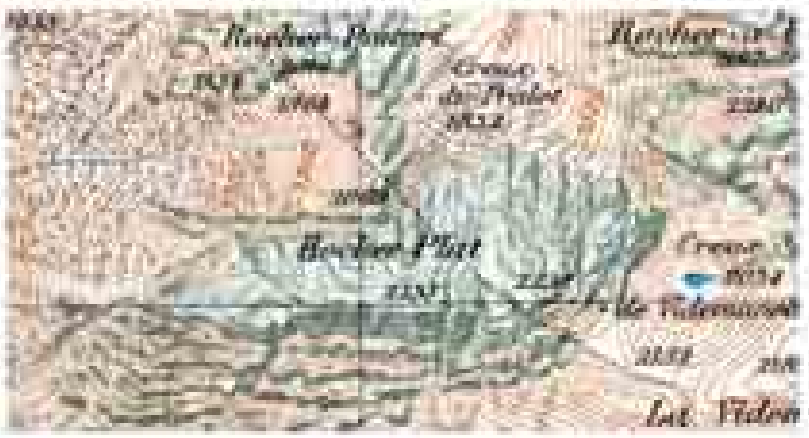


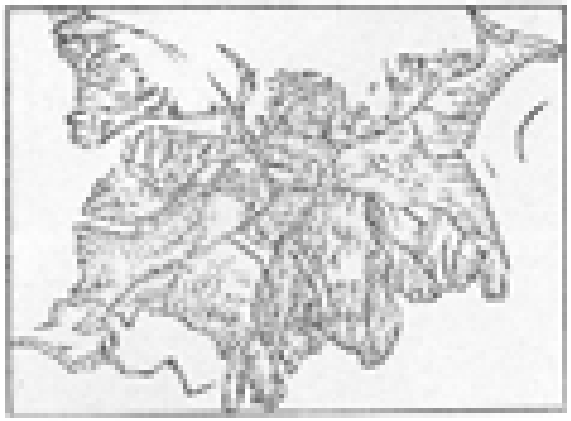
Existing rock drawing

- 19. Century
  - Morphology
  - (orography vs. genesis)

Existing rock drawing

- 20. Century (Part I)
  - Contour line-based drawing
  - Relief, riges



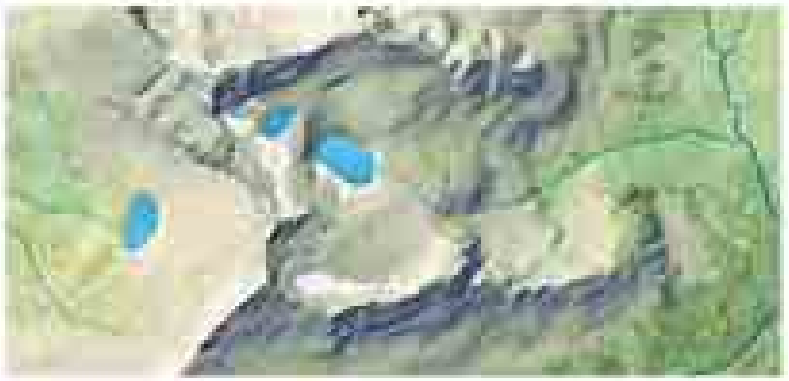


Existing rock drawing

- 20. Century (Part I)
  - Ridge vs. fill hachures
  - Contour lines
  - Slope-hachures

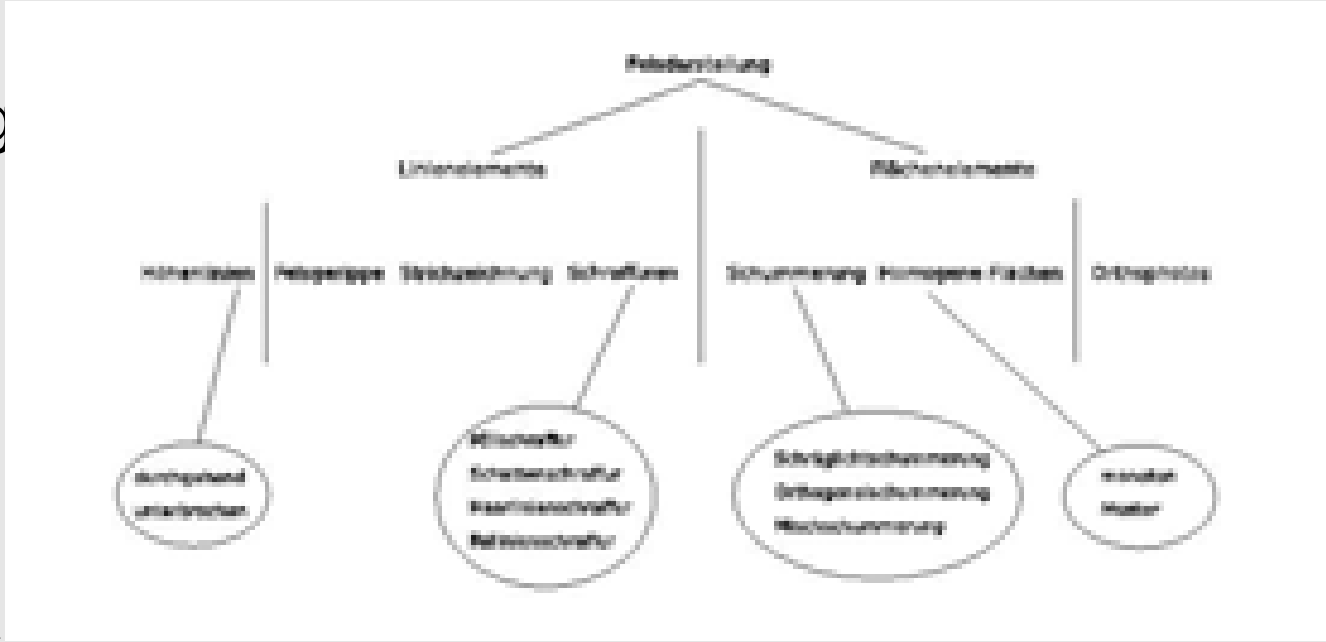
Existing cliff drawings

- 20. Century (Part II)
  - nature like maps
  - orthophotos



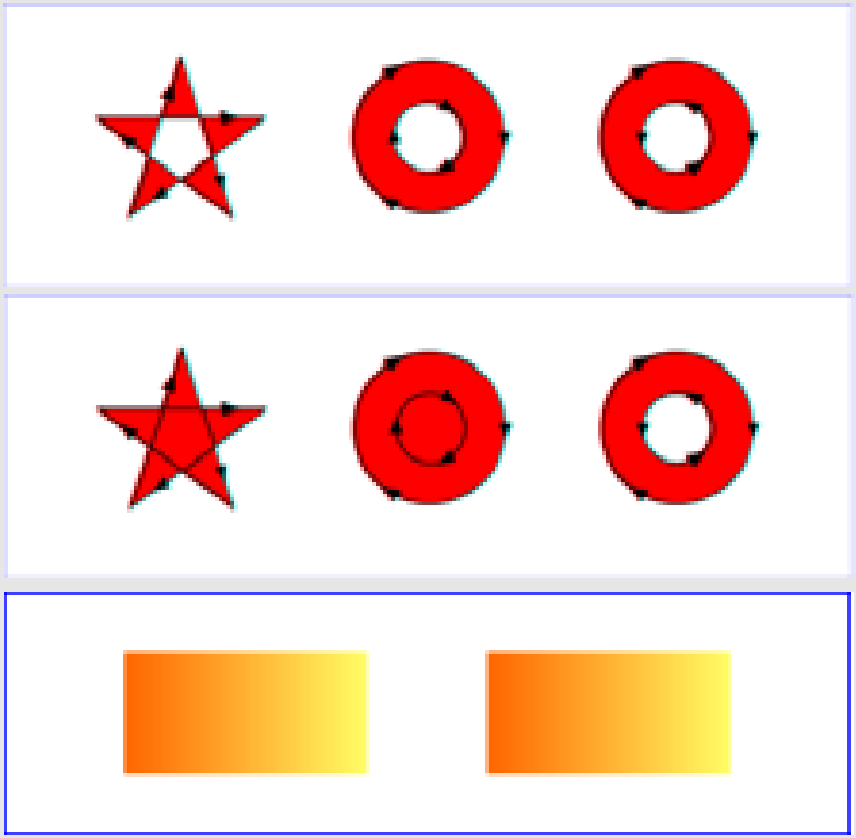
Components of rock drawings

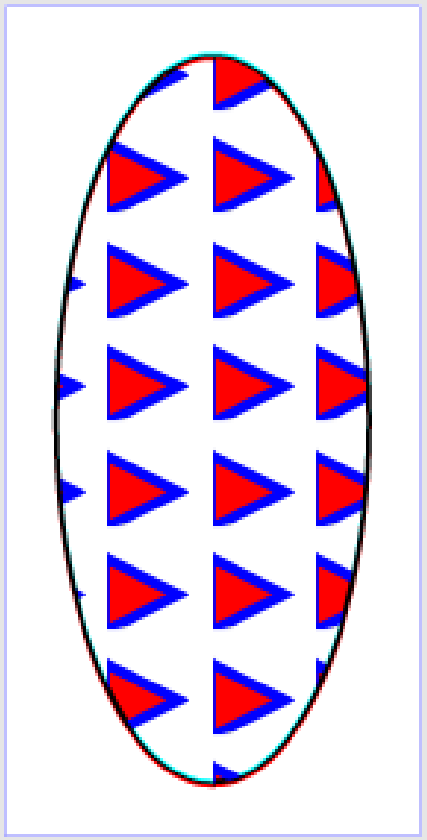
- Area Elements
  - Homogenous areas
  - Pattern
  - Reliefshading
  - Orthophotos
- Line Elements
  - Hachures
  - Strokes
  - Rigde lines
  - Contour lines



Existing algorithms for components

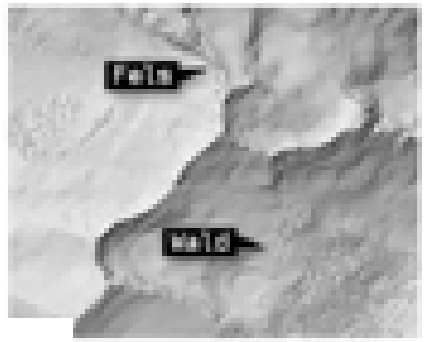
- Areas
  - fill a polygon
  - patterns





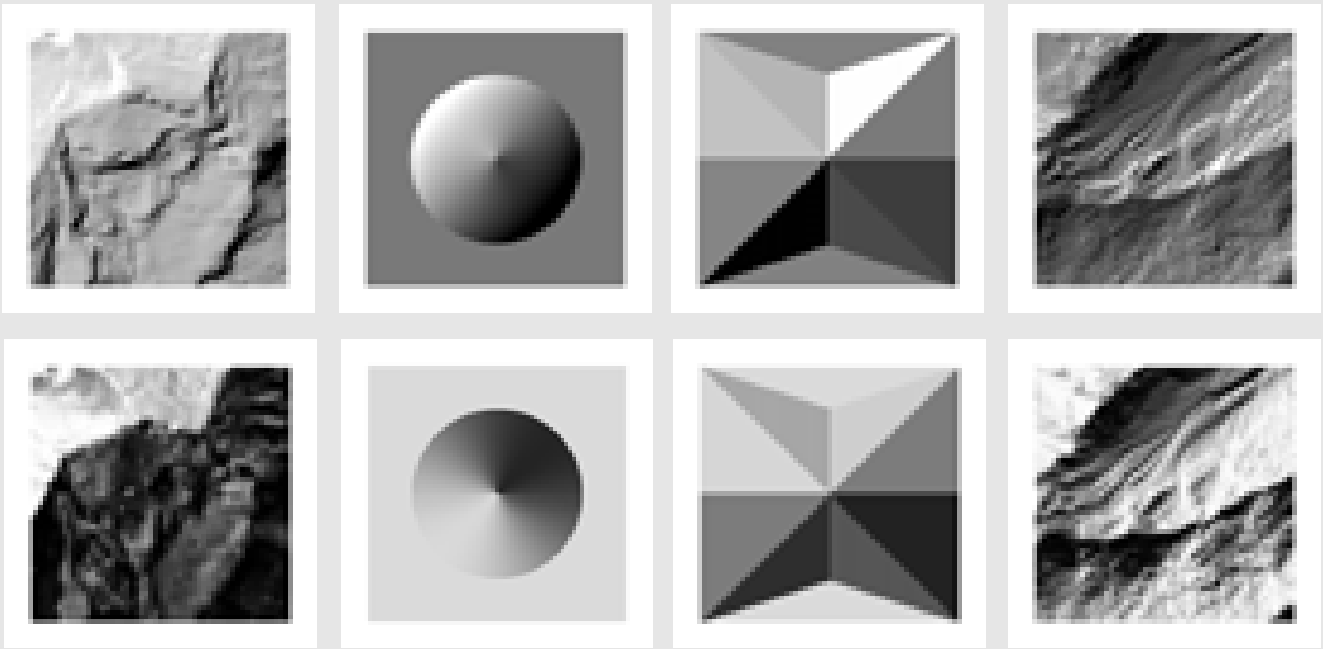
Existing algorithms for components

- Areas
  - Artistic Filters
  - Texture Mapping
  - Fractal Height models



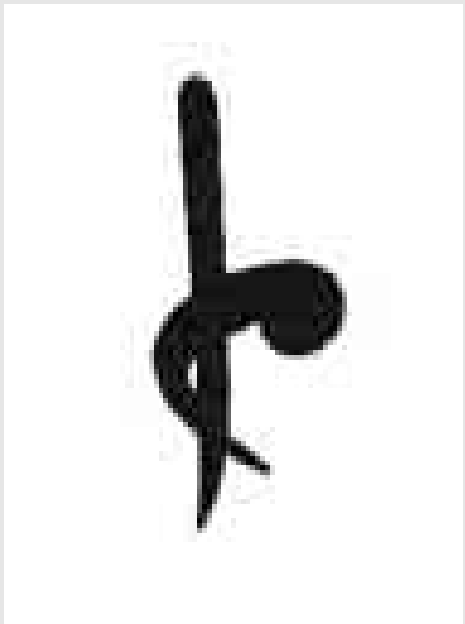
Existing algorithms for components

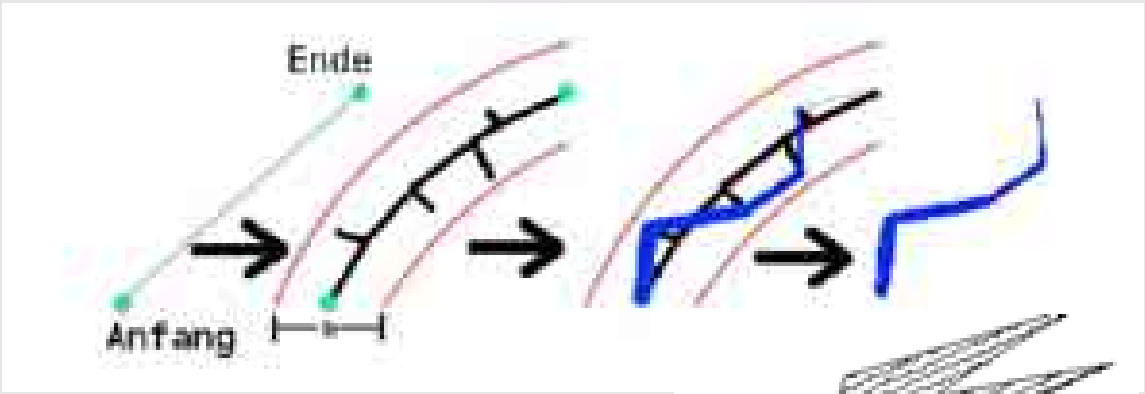
- Areas
  - Shadings

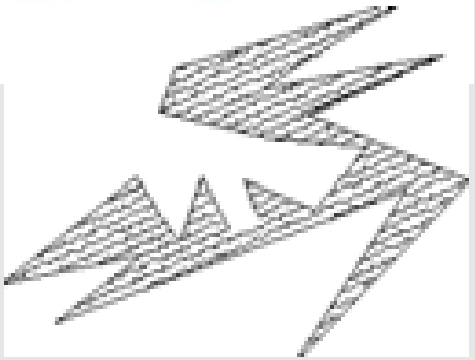


Existing algorithms for components

- Lines
  - rock hachures (Dahinden 2000 -> Hurni 1995)
  - calligraphic line

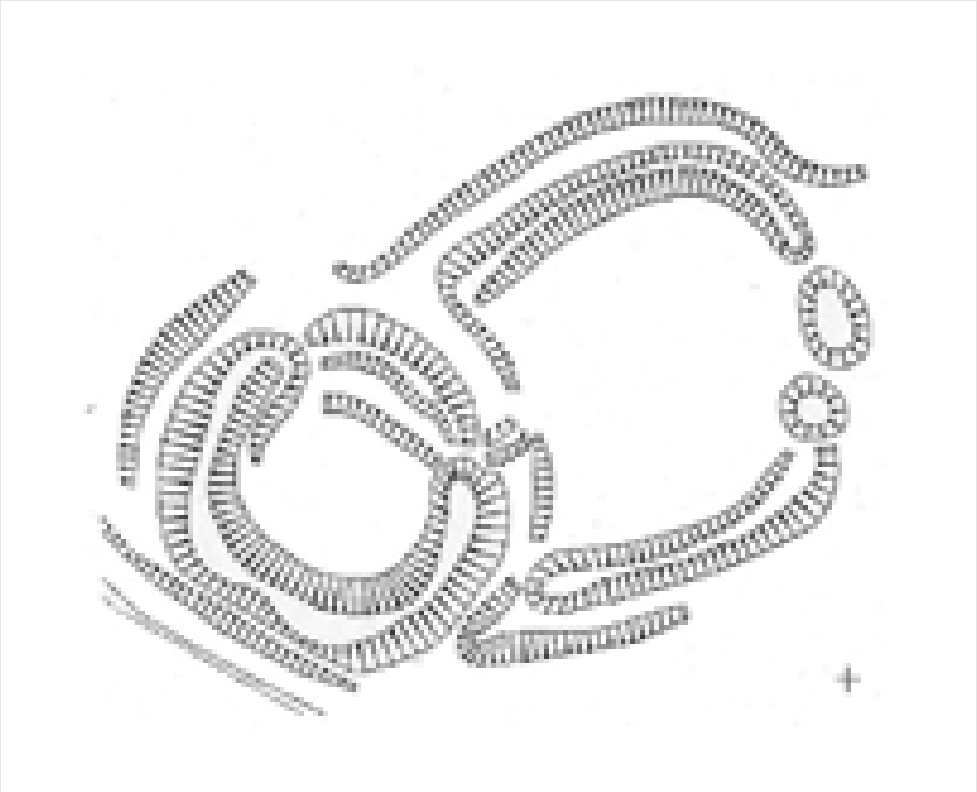






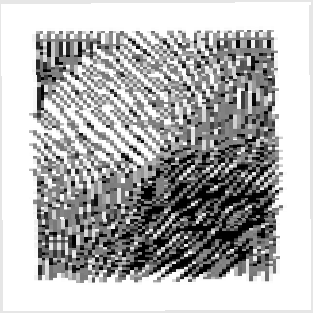
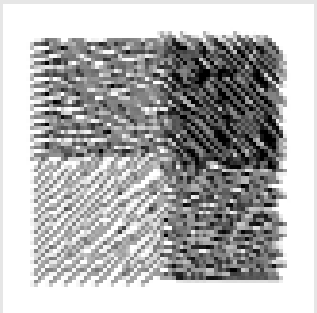
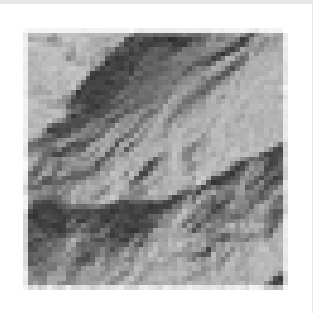
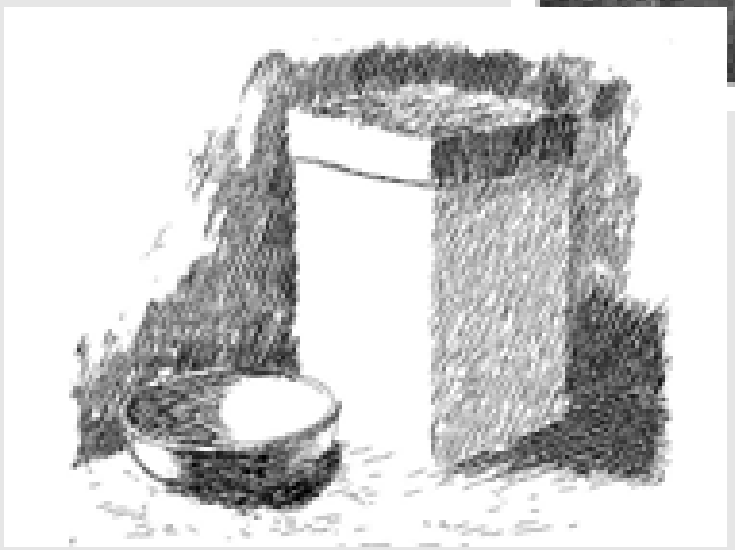
Existing algorithms for components

- Lines
  - slope hachures (Regnauld et al. 2002)



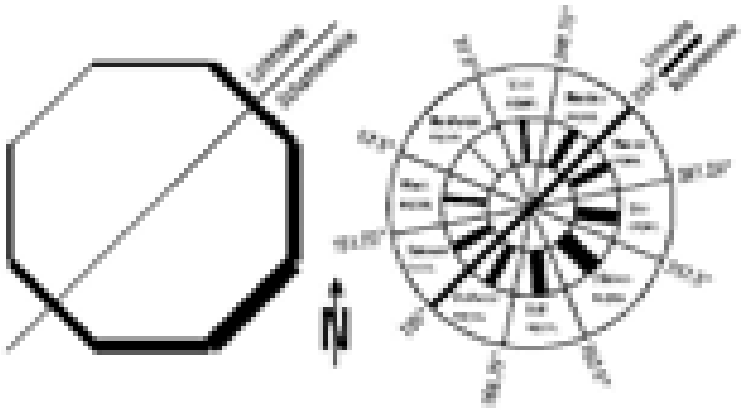
Existing algorithms for components

- Lines
  - Floyd-Steinberg-Diffusion with lines
  - Pen-and-ink illustration (Winkenbach and Salesin 1994)

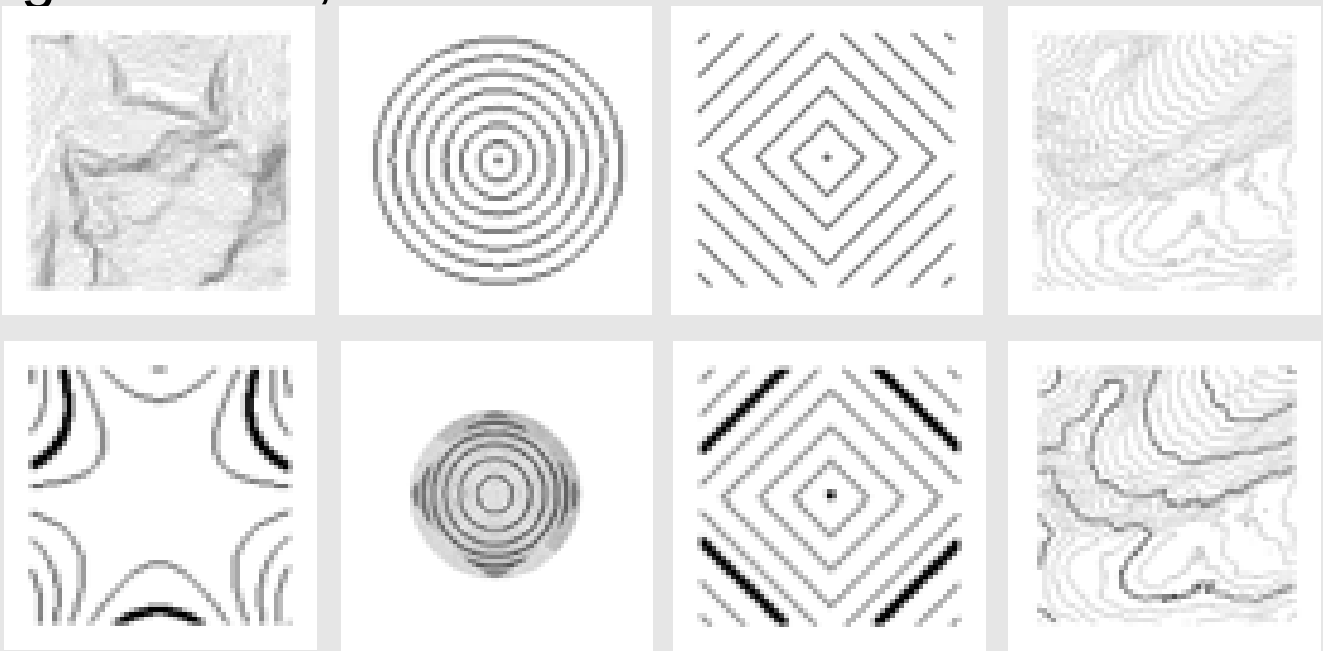
Existing algorithms for components

- Lines
  - Ridge Lines (Hurni 1995)



Existing algorithms for components

- Lines
  - Contour Lines
- Growing of Pixels, Combination

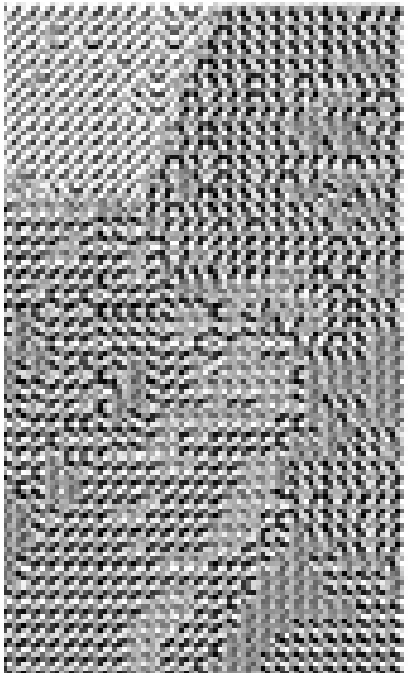


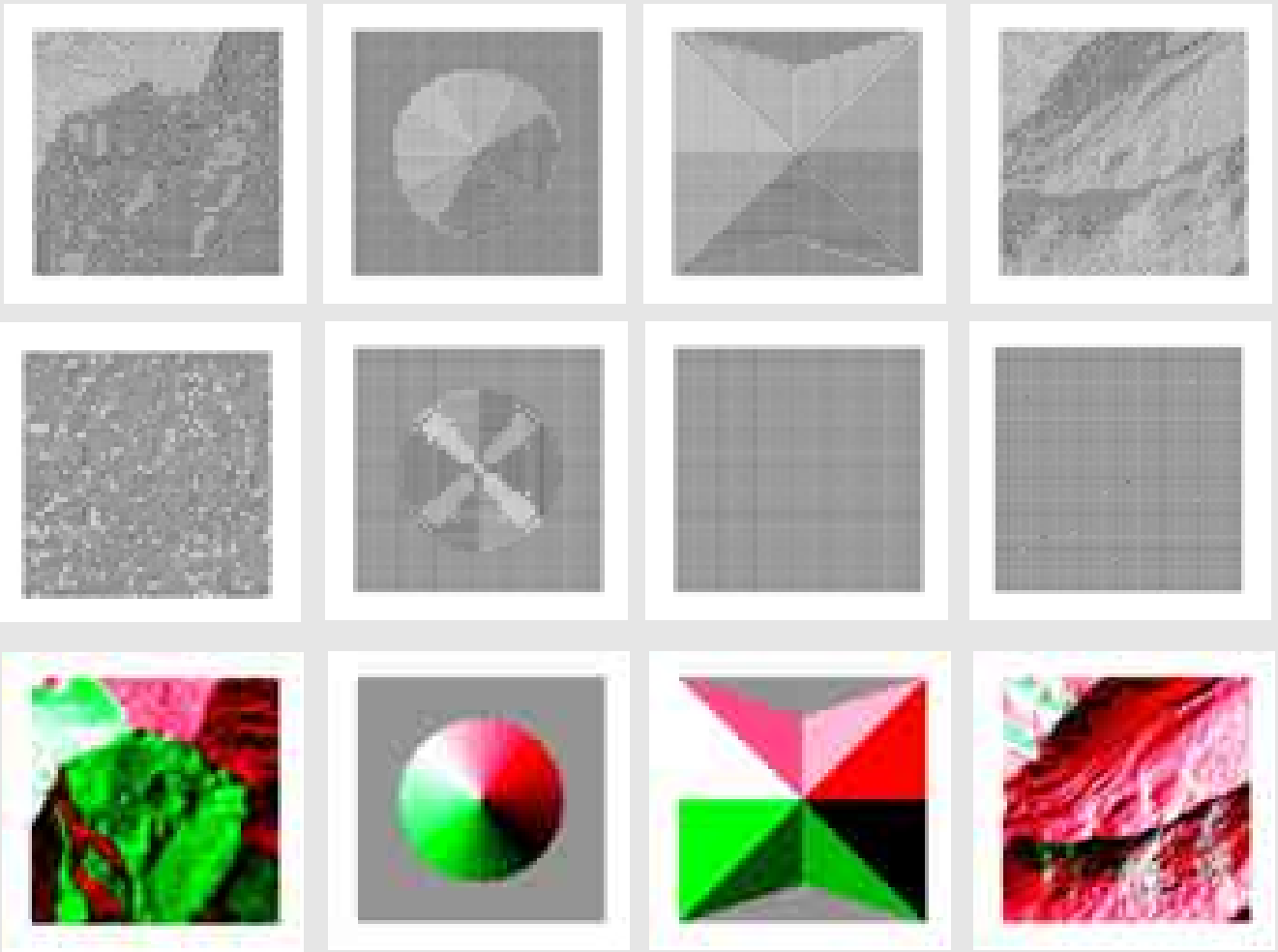
New and changed Algorithms

- Consulting Instructions for rock drawing
  - Finsterwalder 1928, ~Brandstätter 1969, Gilgen 1998
- Changing existing algorithms (add/use infomation of the first and second derivate)
- Only process-oriented algorithms (never load the whole dtm; except normalisation and rotation of the image)
- Only full-automatic algorithms (Programs run in a terminal)
- Dithering, Floyd-Steinberg, Pattern, Buffered-Pattern, Overlapping hachure, 2nd derviate shading
- Use in a Pipe with existing programs, put it ALL together

Test's

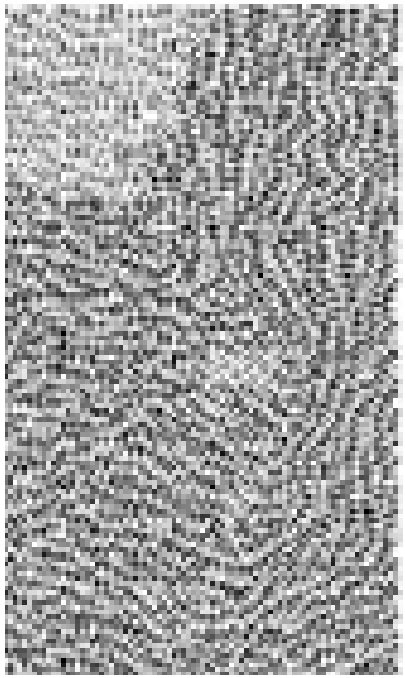
- Area
  - dithering

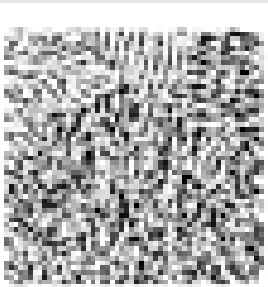
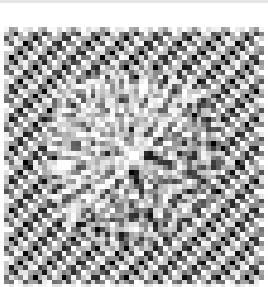
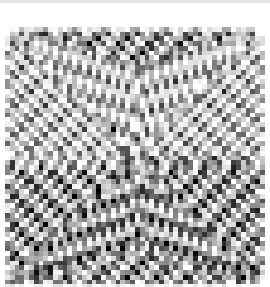


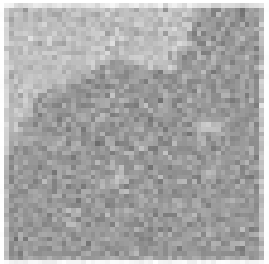
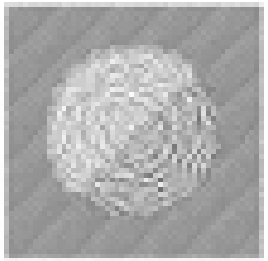
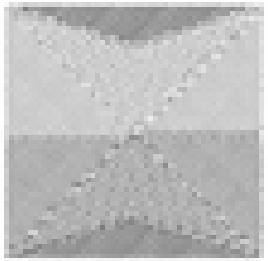
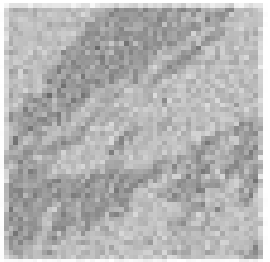
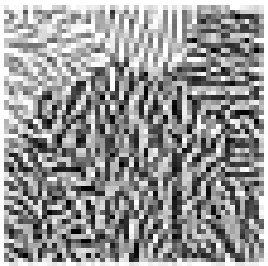
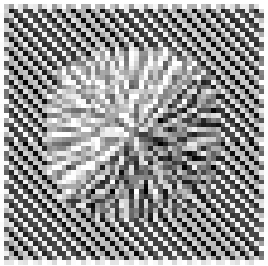
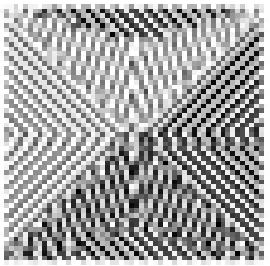
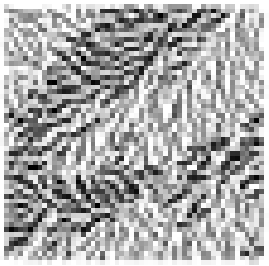


Test's

- Area
  - pattern

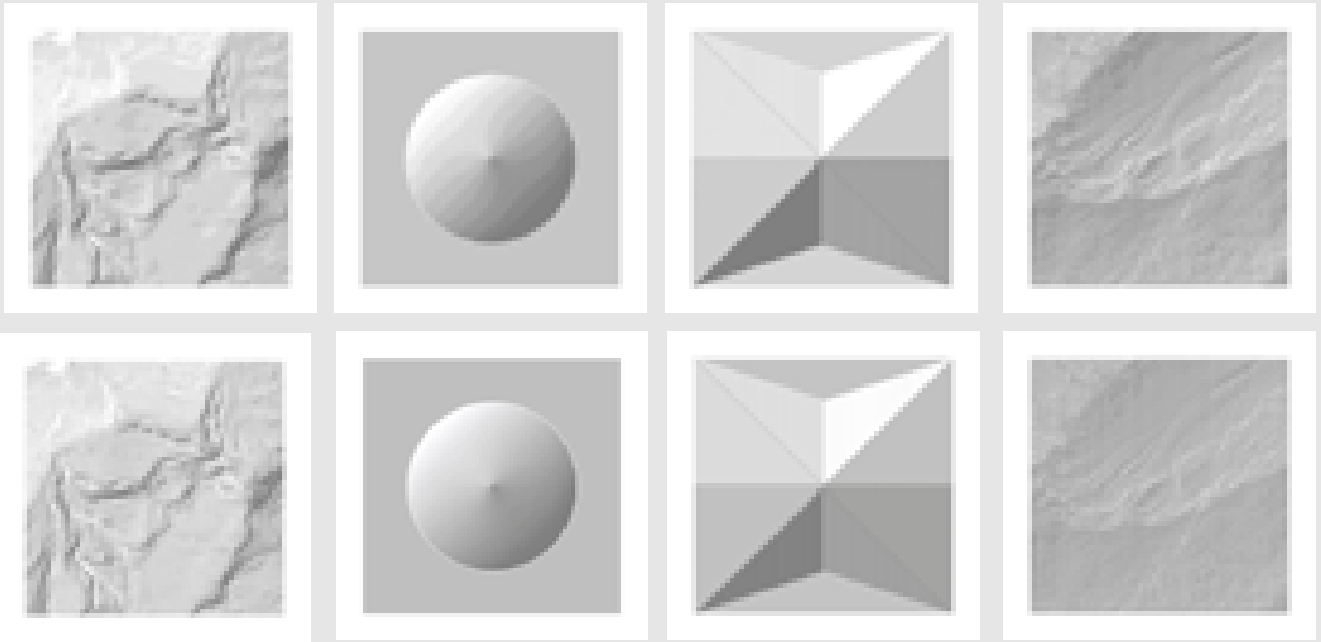


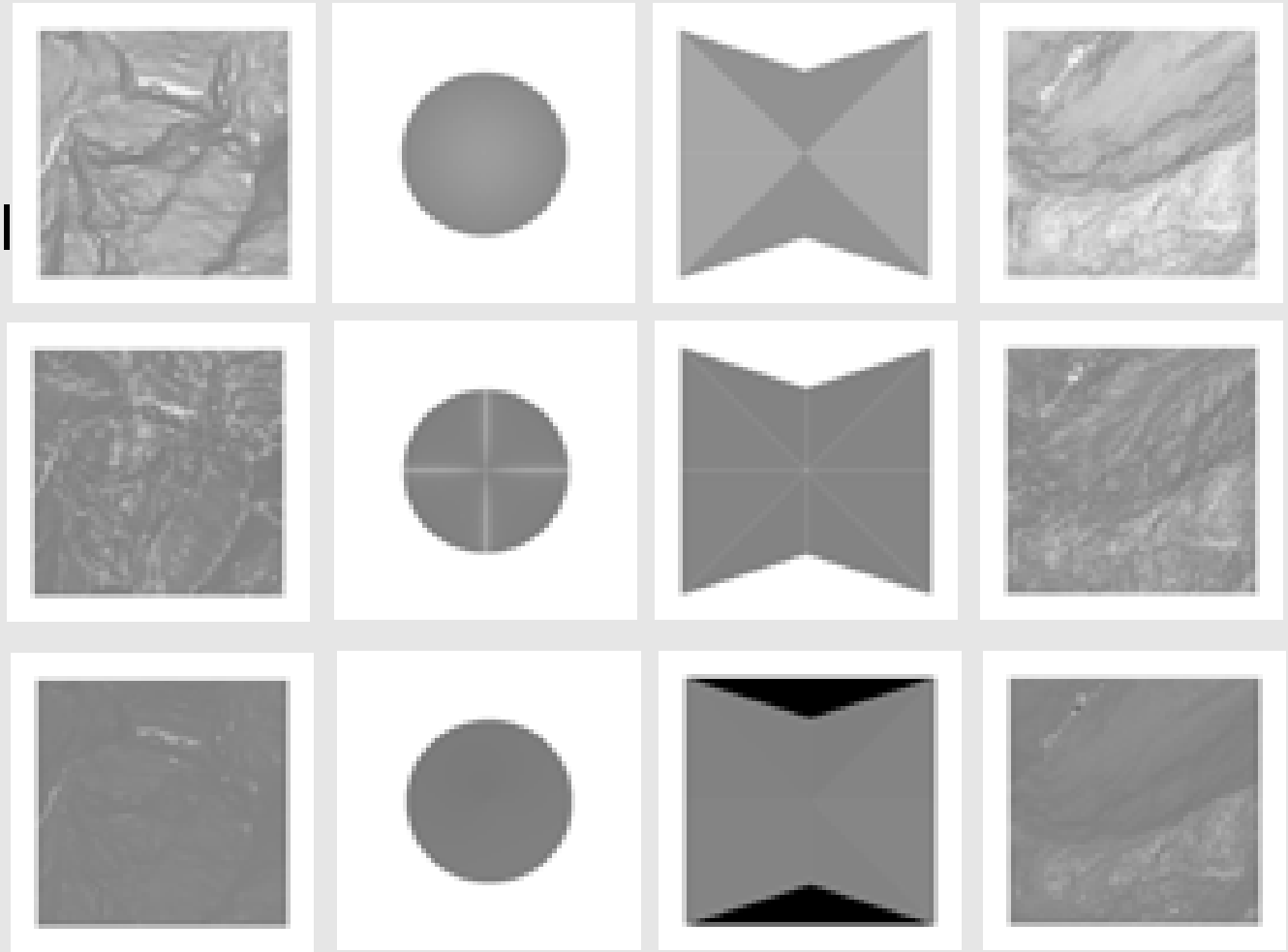
Test's

- Area
  - shading



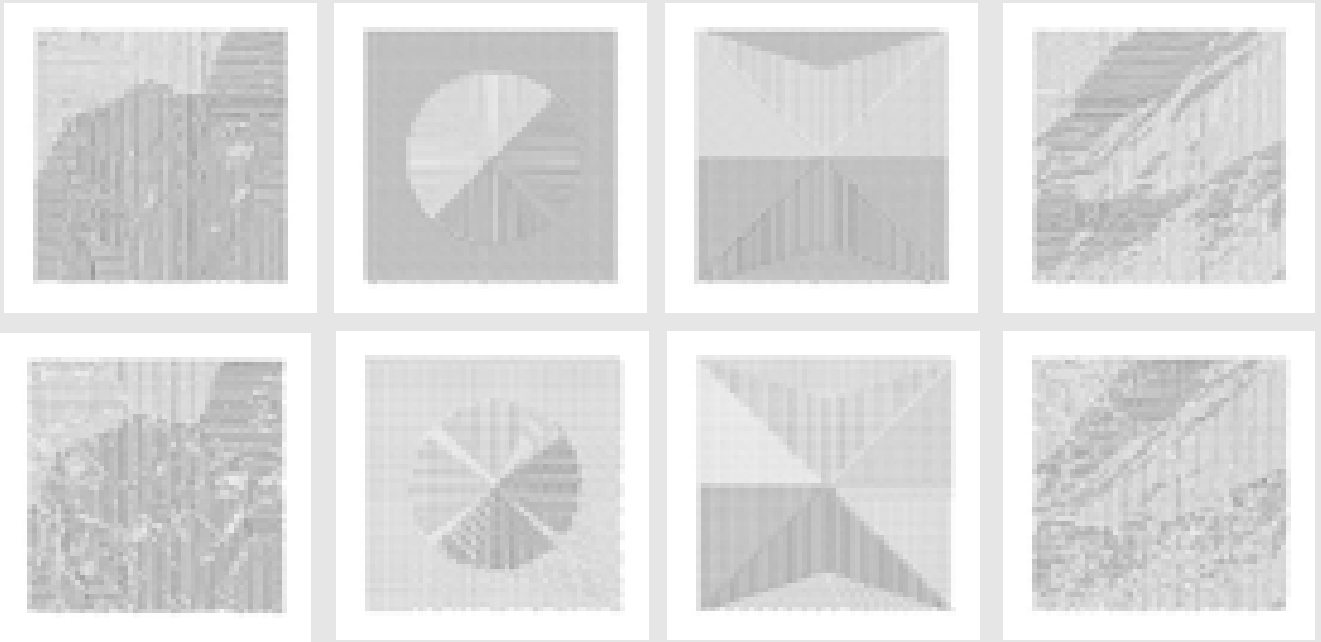
Test's

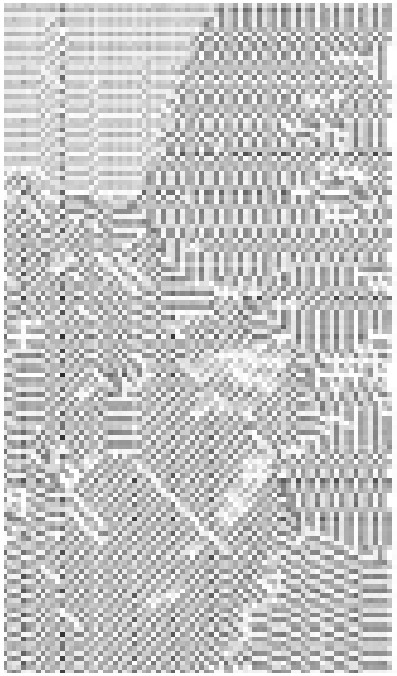
- Area
  - shading
  - orthogonal



Test's

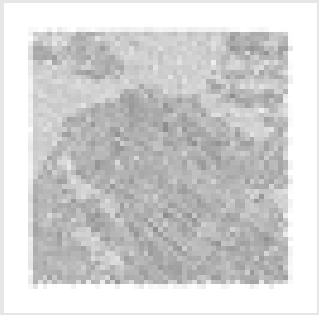
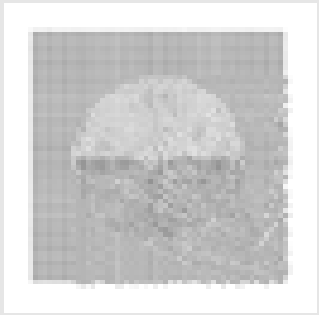
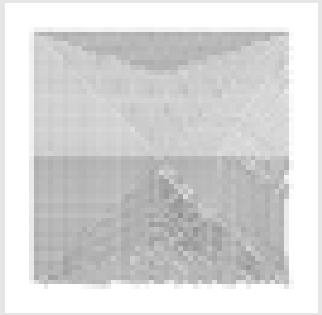
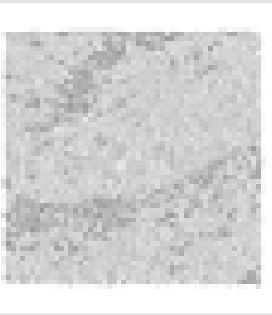
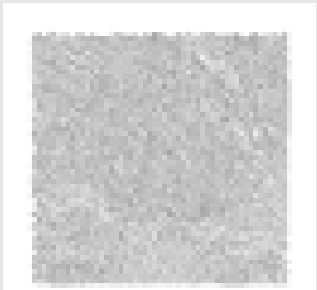
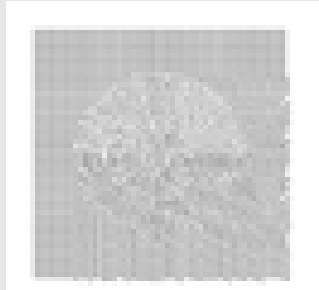
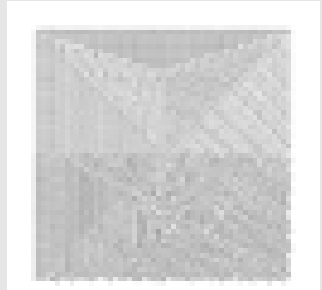
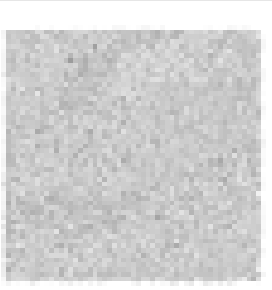
- Line
  - hachures I

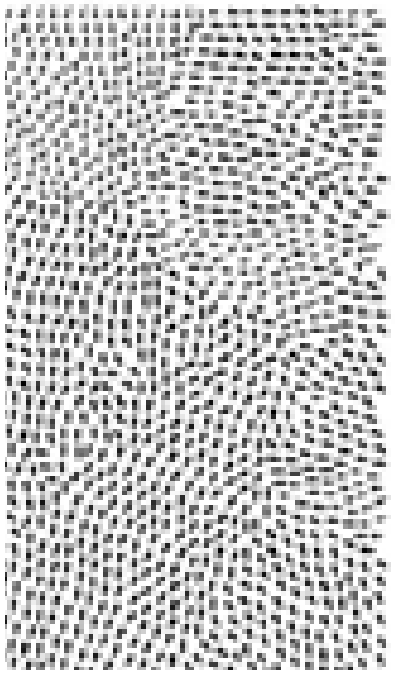




Test's

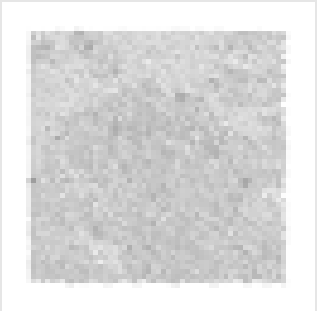
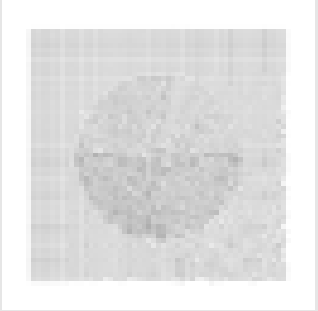
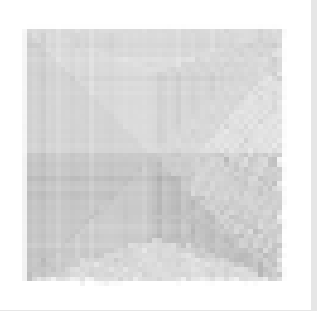
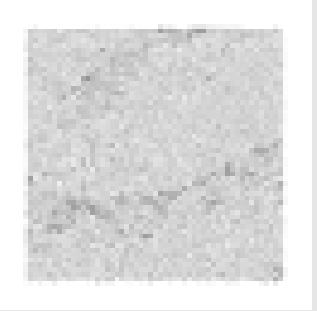
- Line
  - hachures I

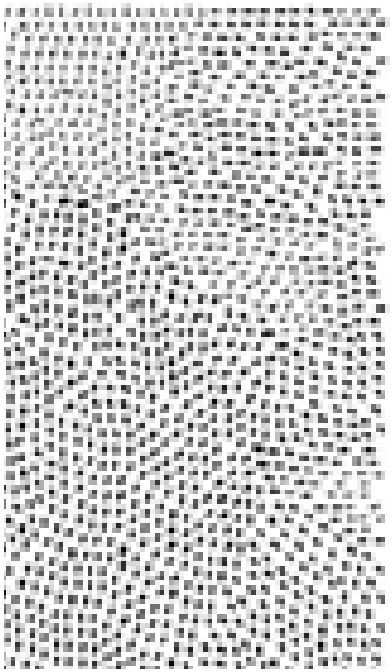
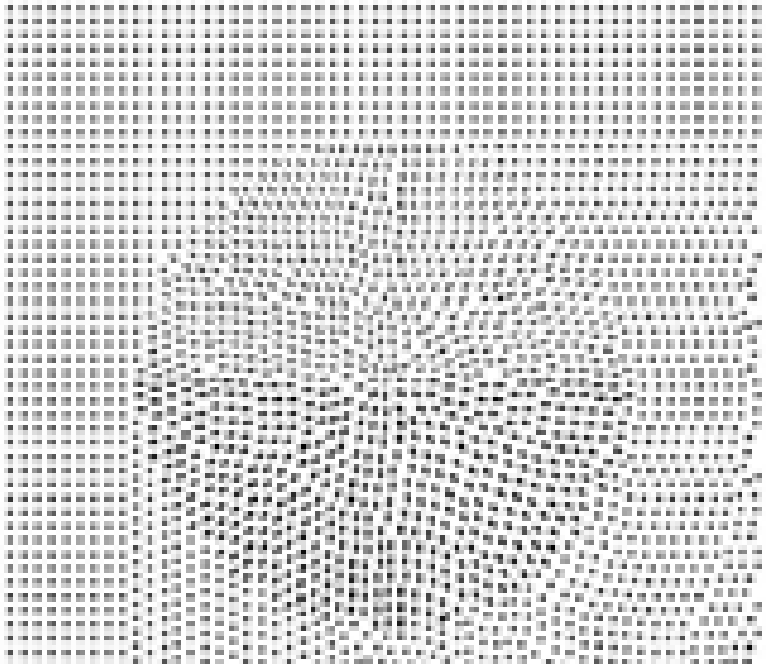











Test's

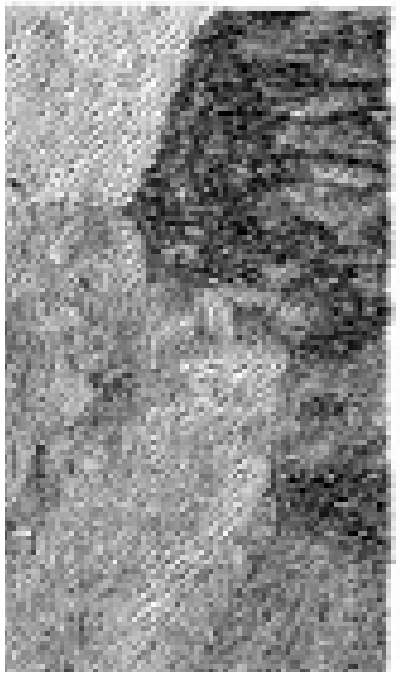
- Line
  - hachures I

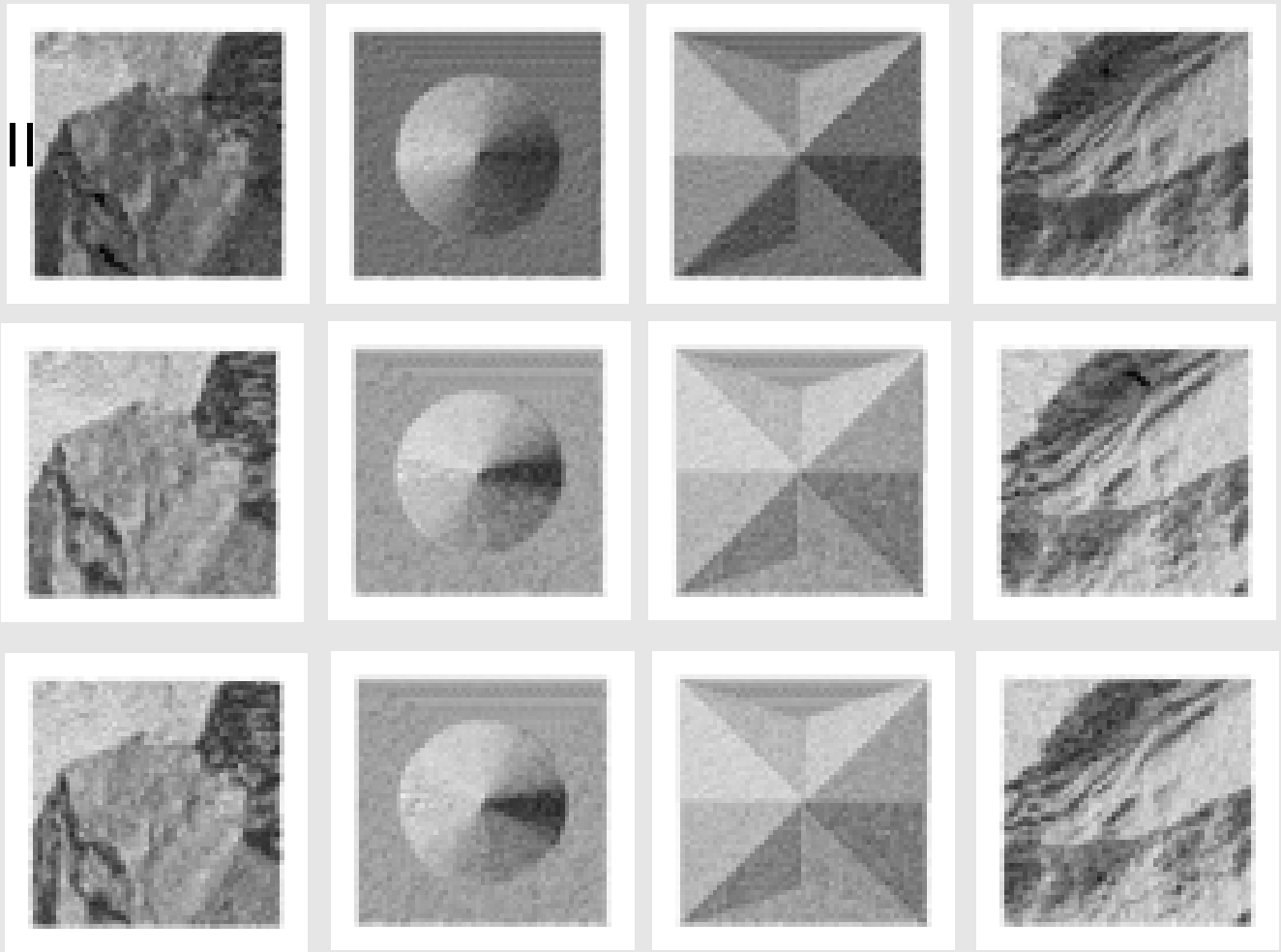





Test's

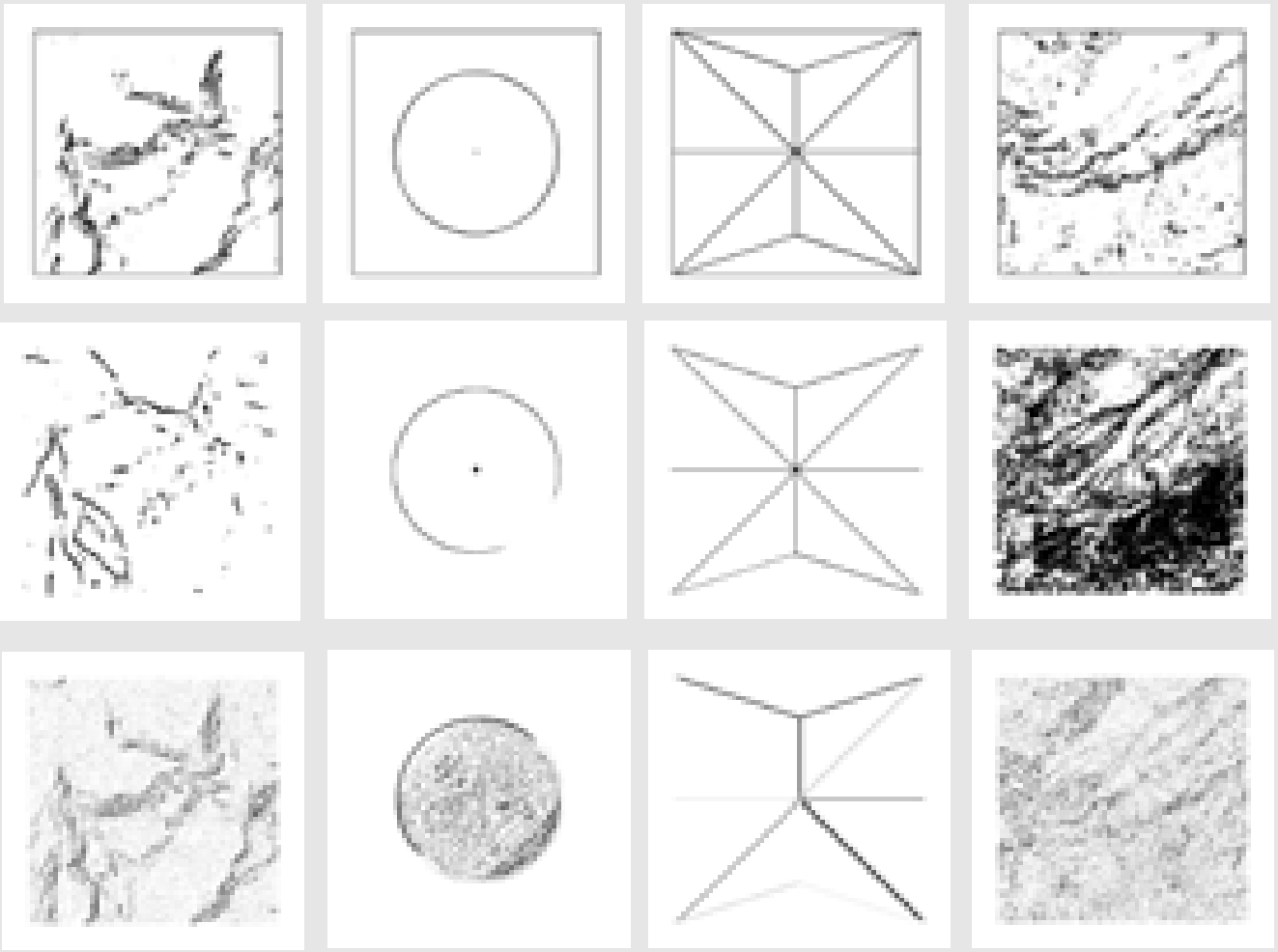
- Line
  - hachures III





Test's

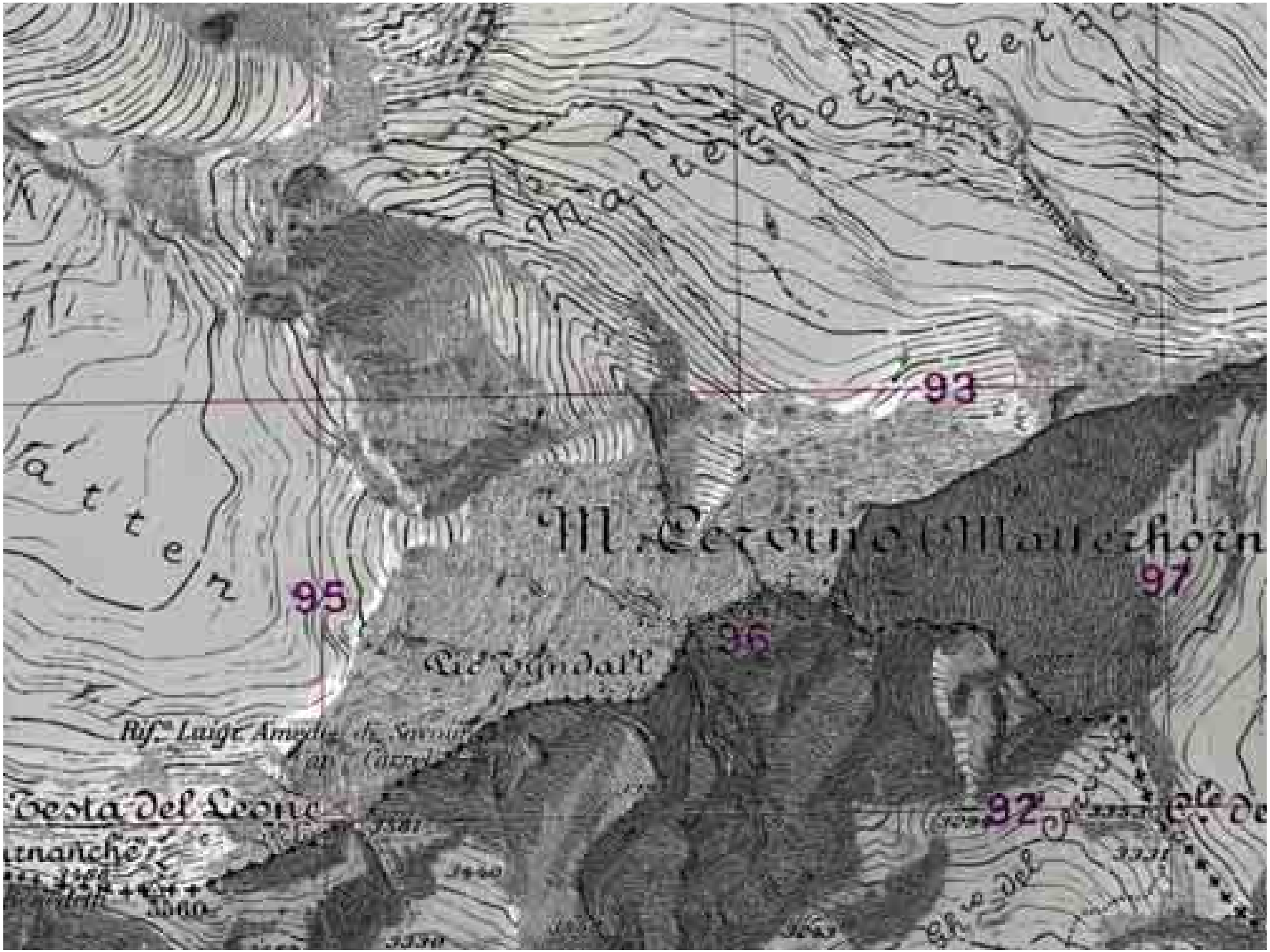
- Line
  - ridges



Put it all together

- Topographic Map
- Mask
- Analytic Drawings

- => the target is a map 1: 25 000 (not the screen)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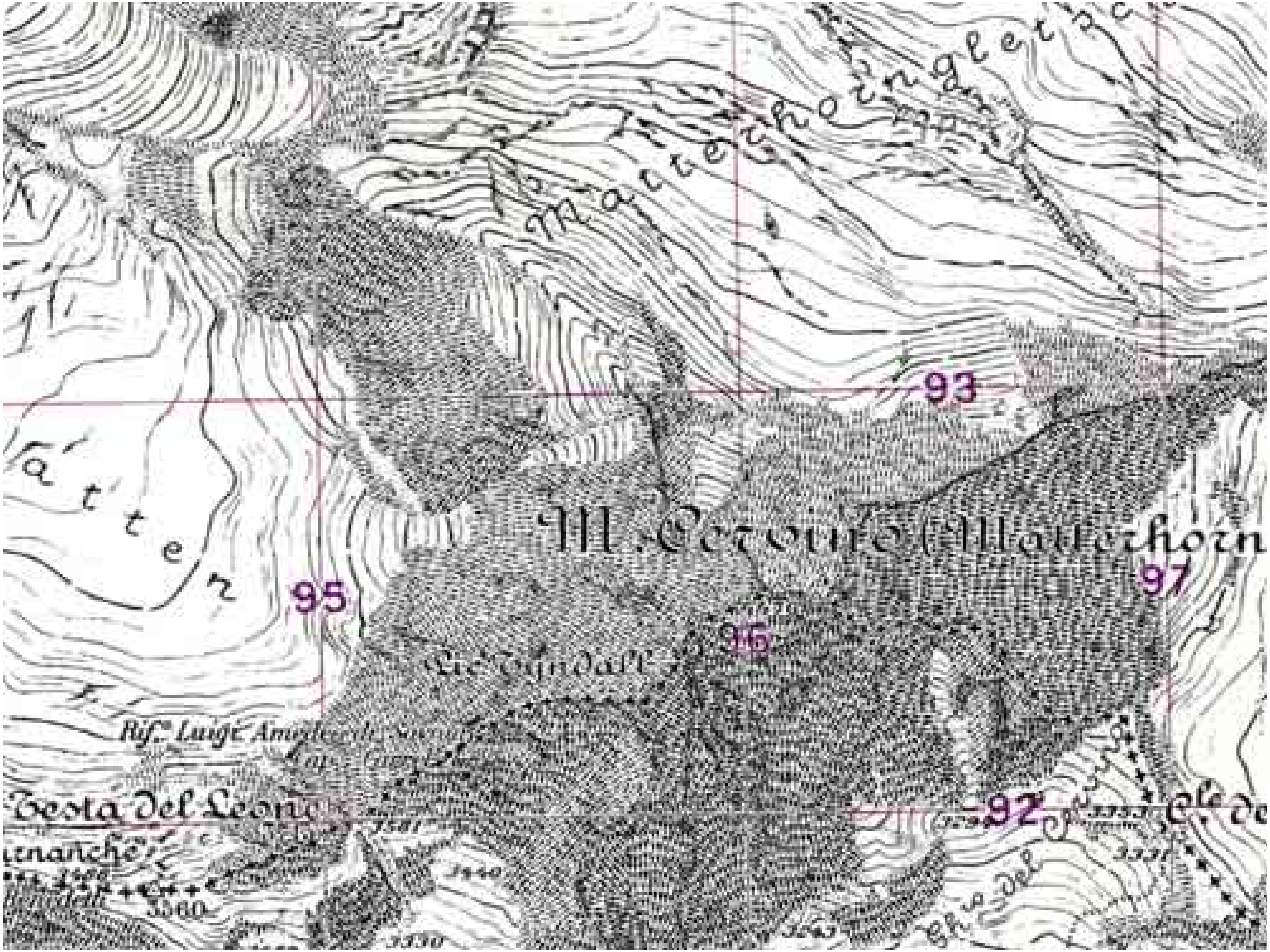
Testa del Leone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M. Cervino (Matterhorn
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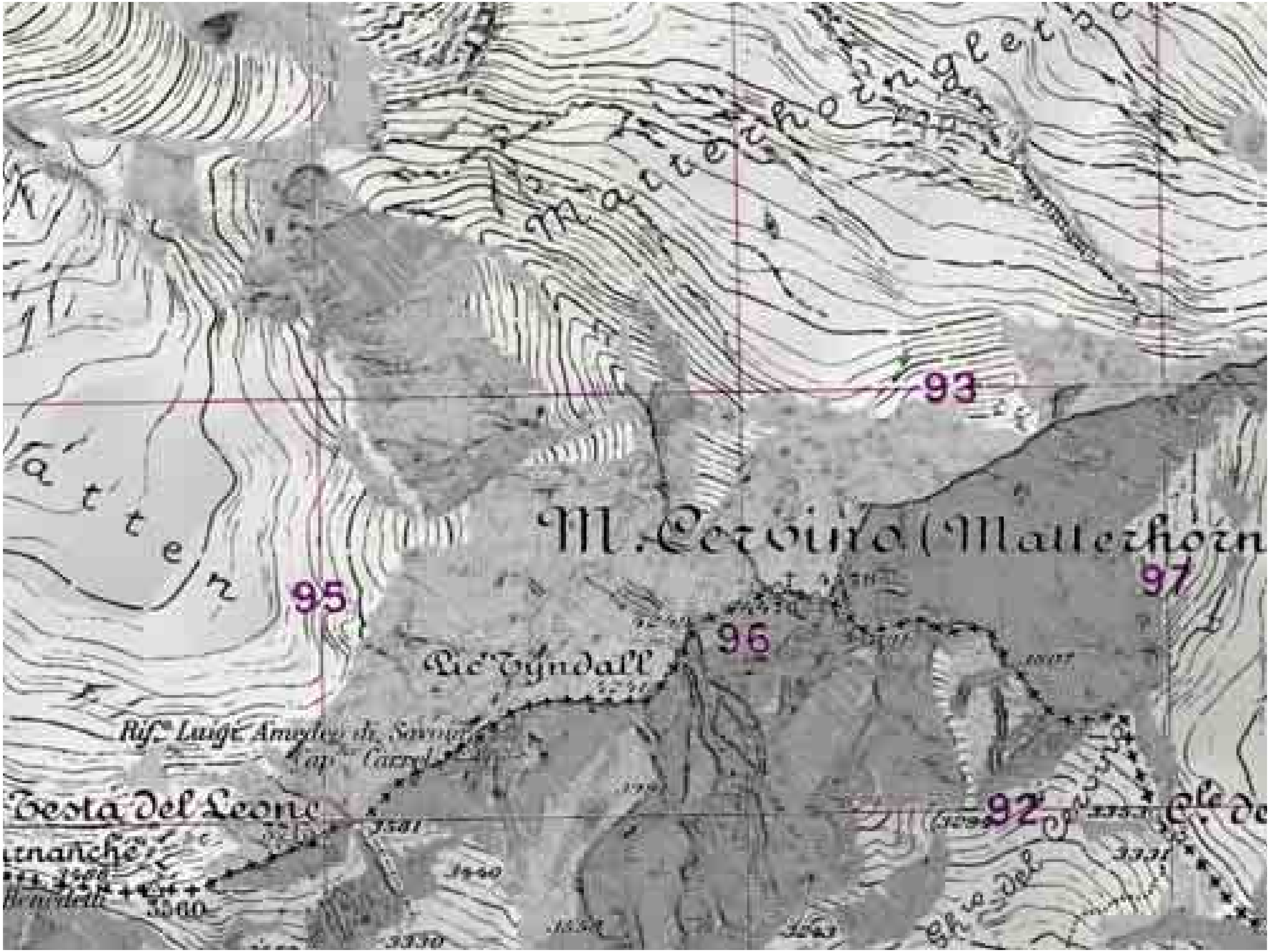

M. Cervino (Matterhorn
Pic Tyndall
Testa del Leone
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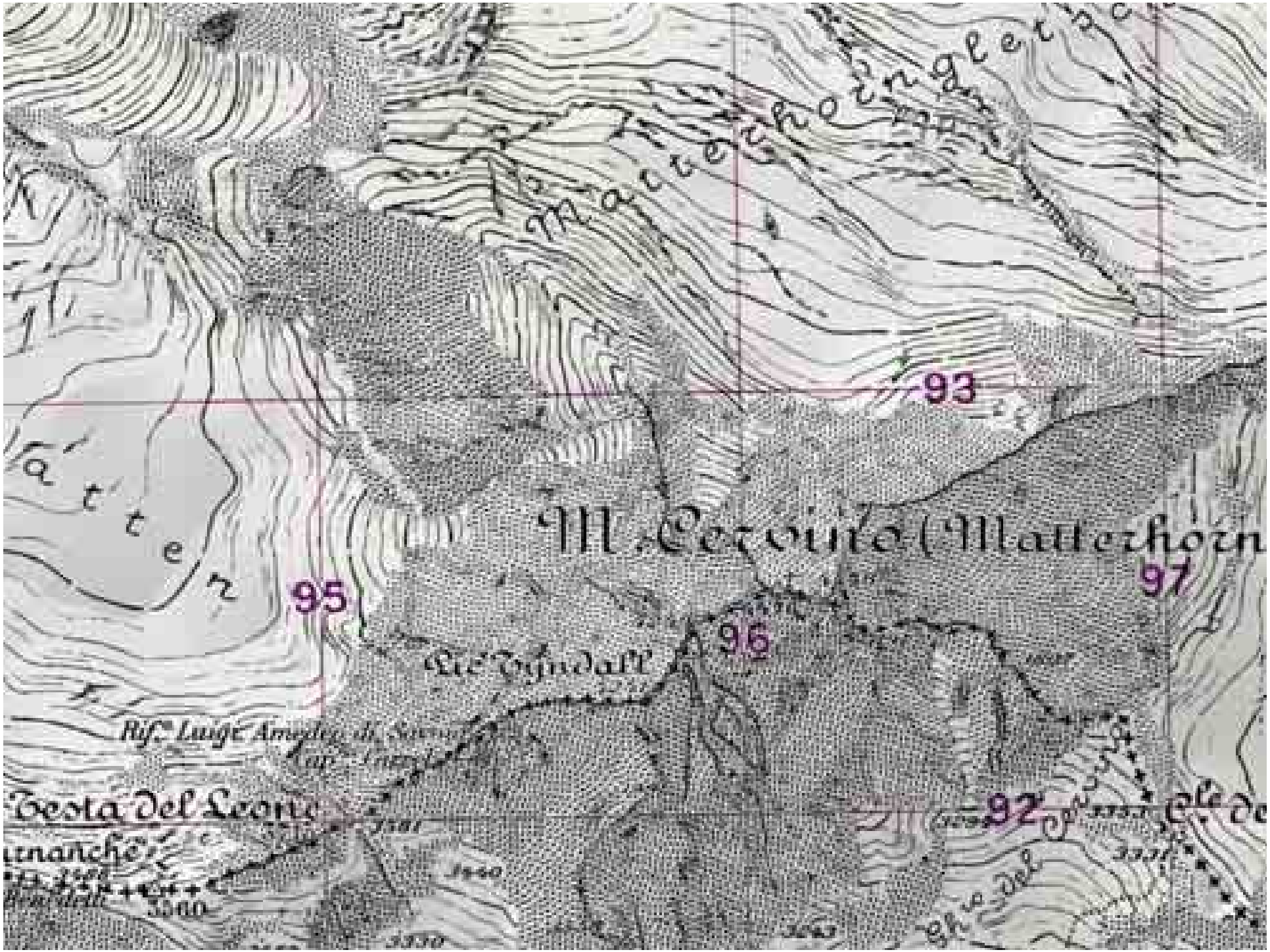
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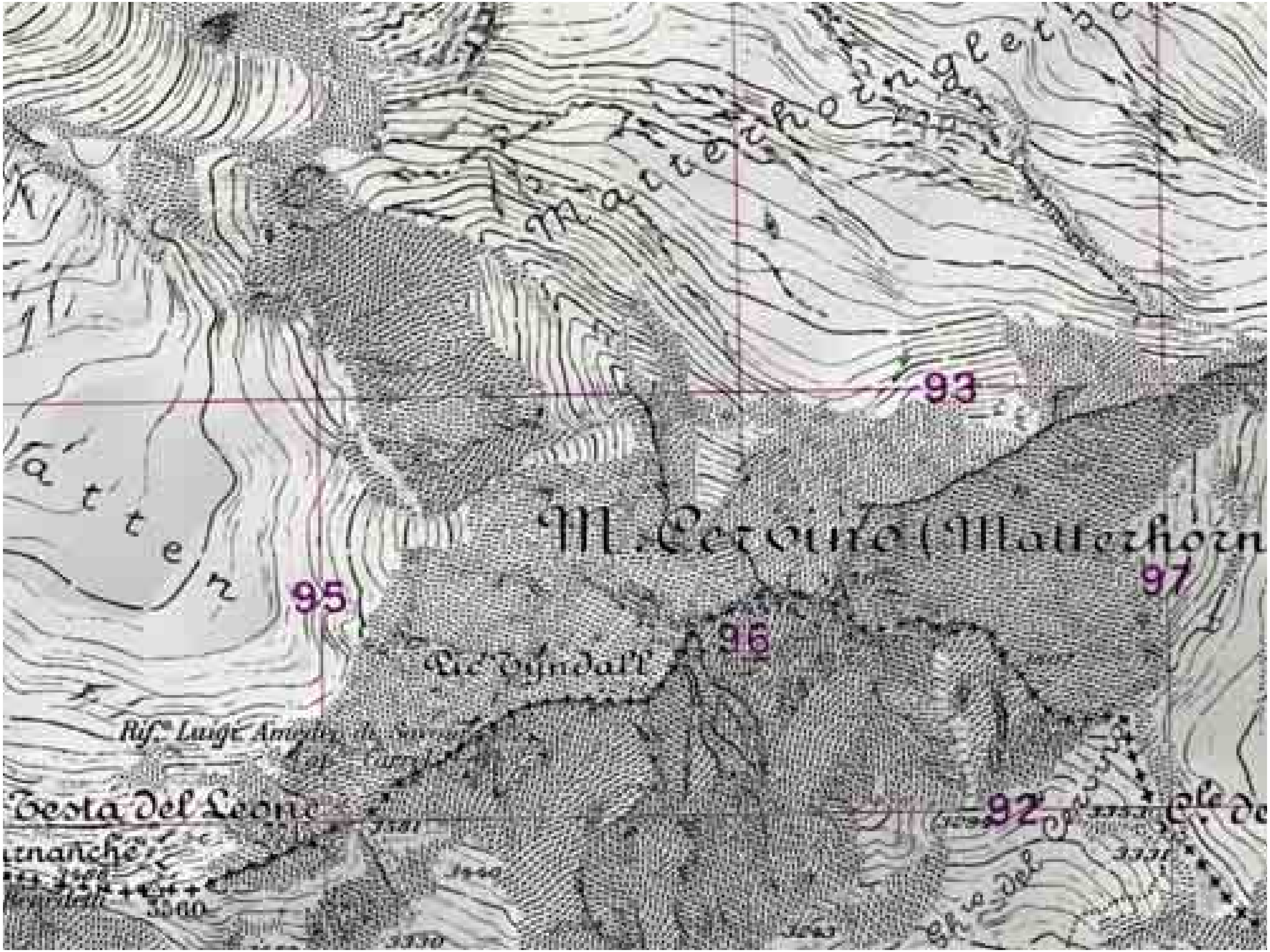

M. Cervino (Matterhorn
Pic Tyndall
Testa del Leone
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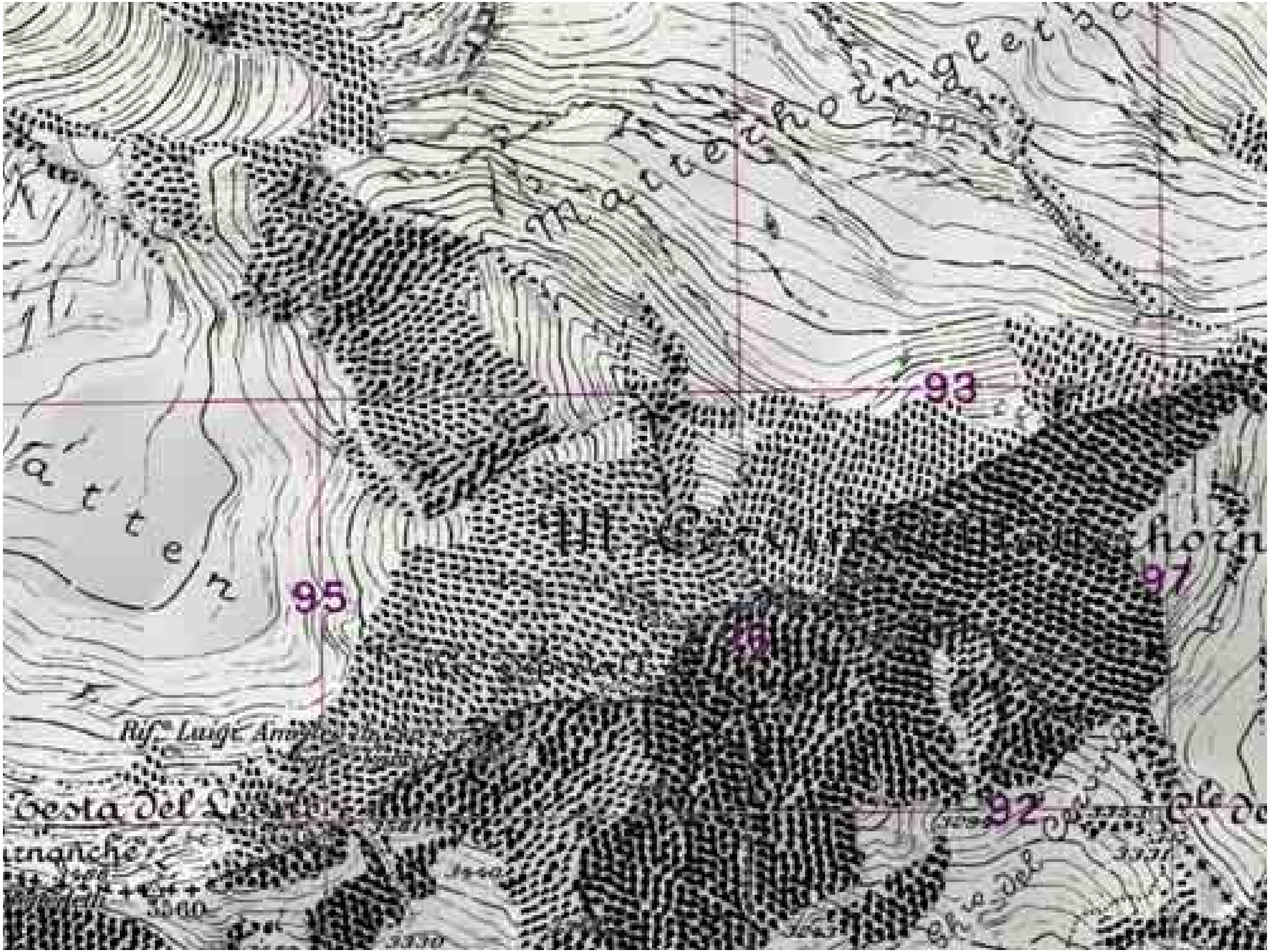
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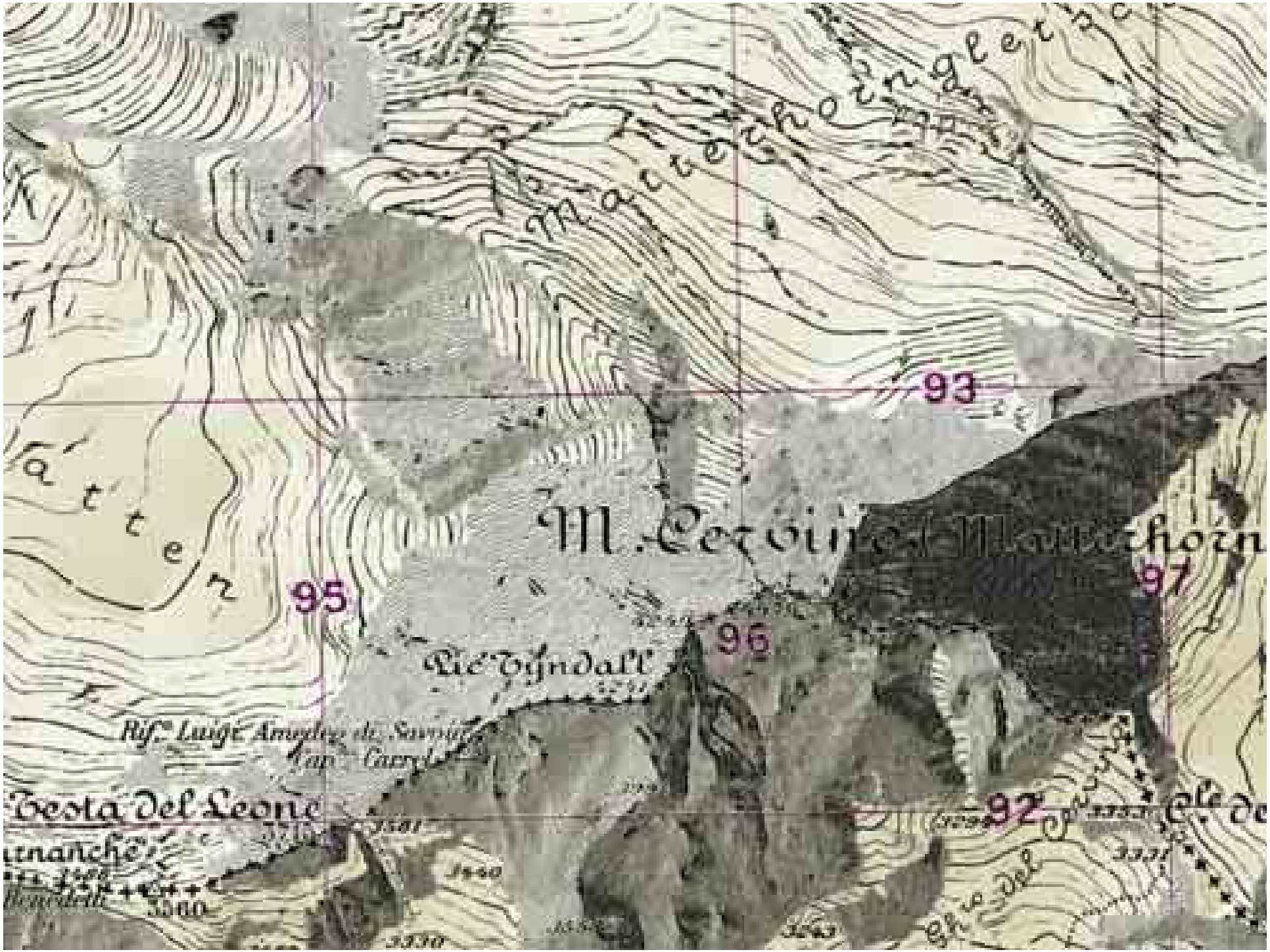
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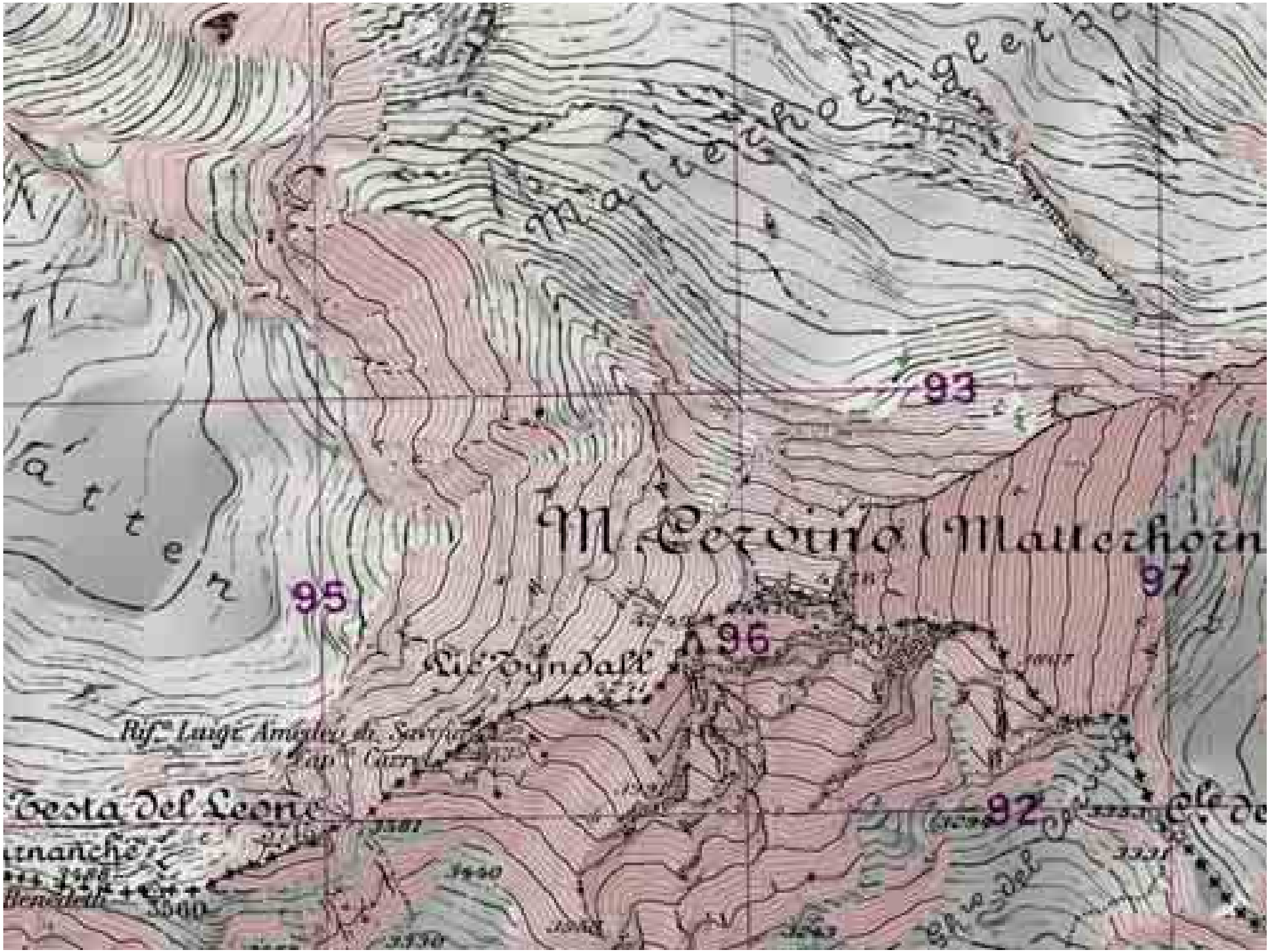
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Testa del Leone

M. Cervino (Matterhorn
Pic Tyndall
Testa del Leone
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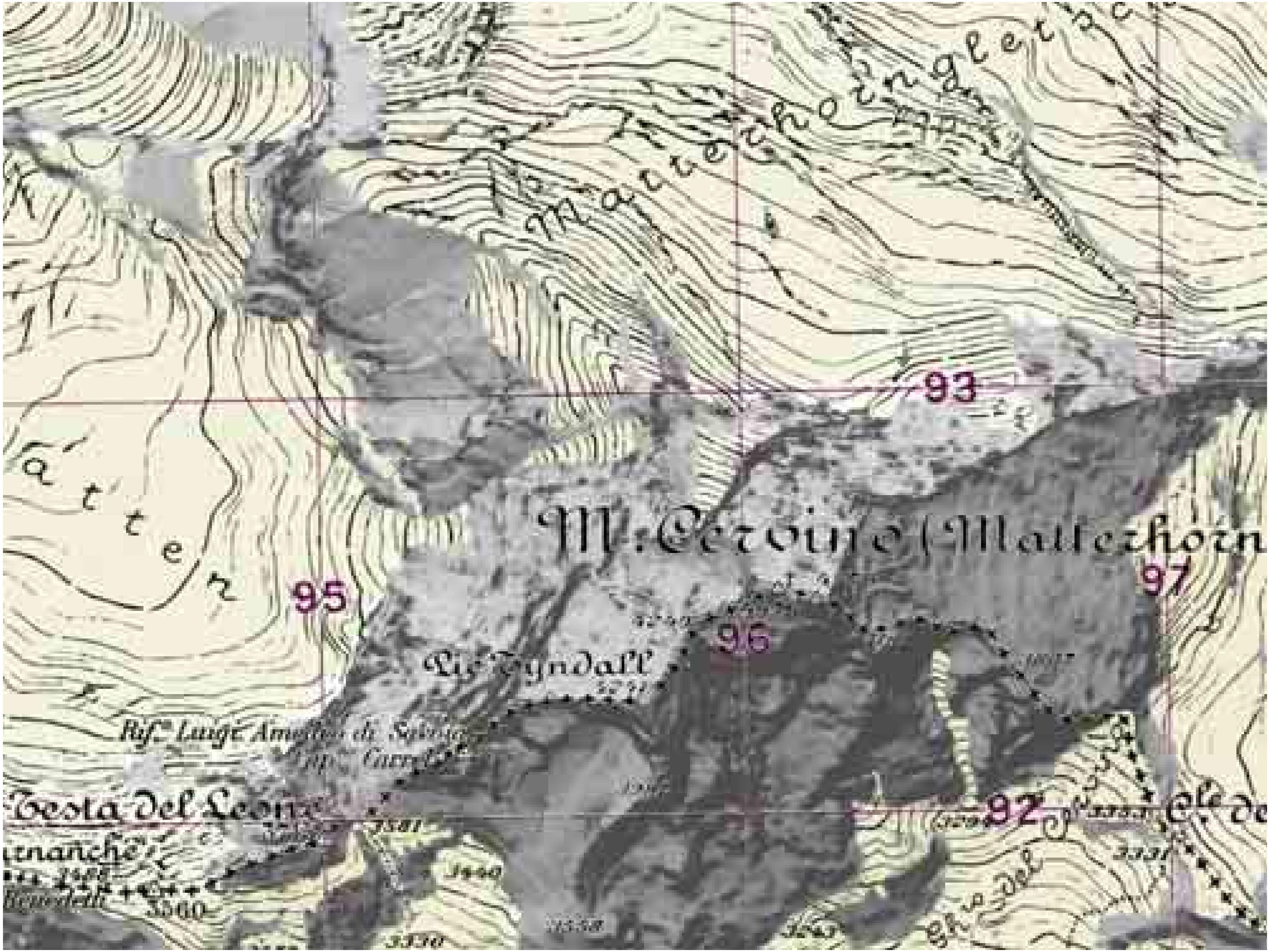

M. Cervino (Matterhorn
Pic Tyndall
Testa del Leone
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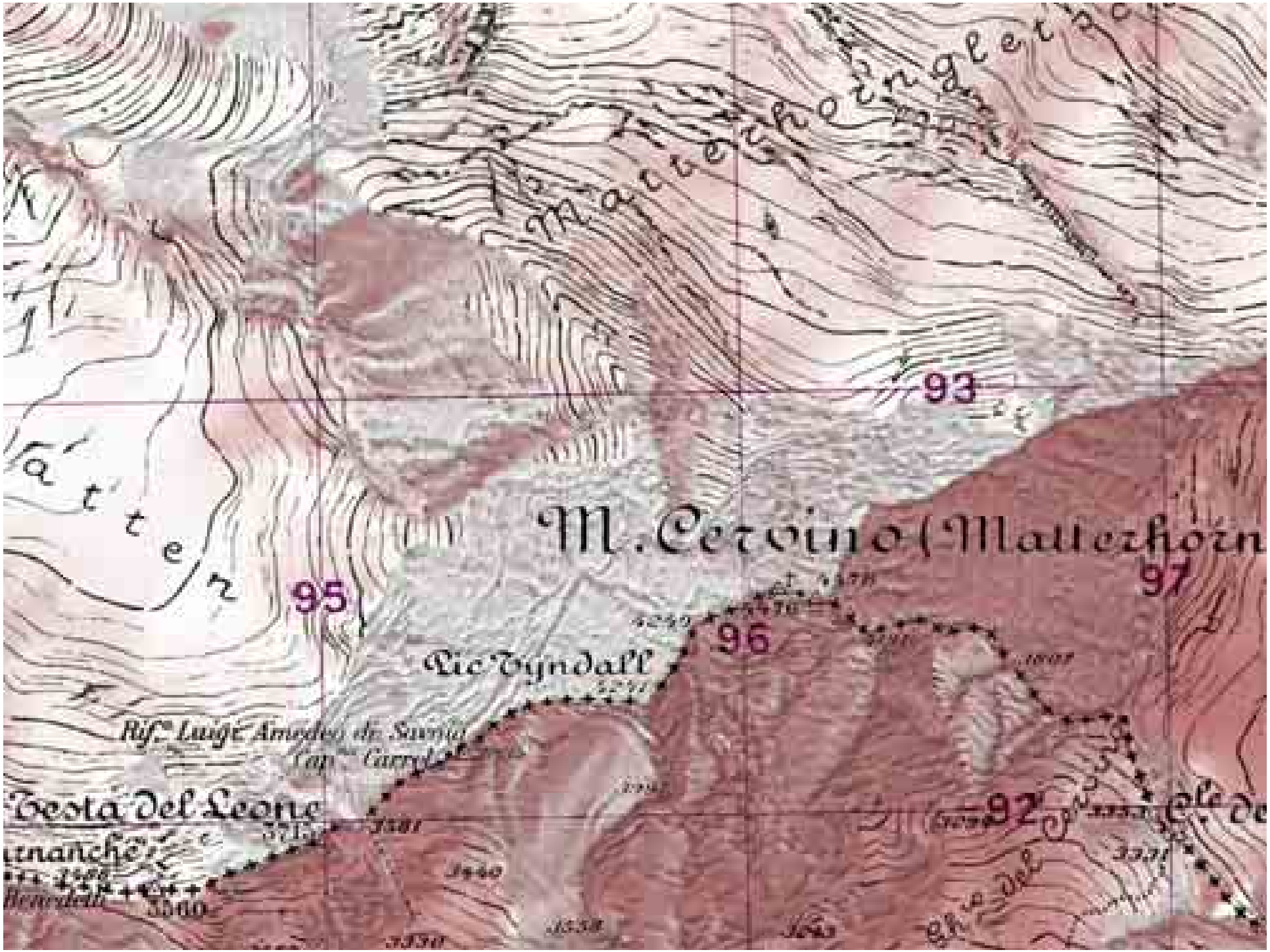
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Pic Tyndall
Testa del Leone

Alternative presentations.. . . . . .