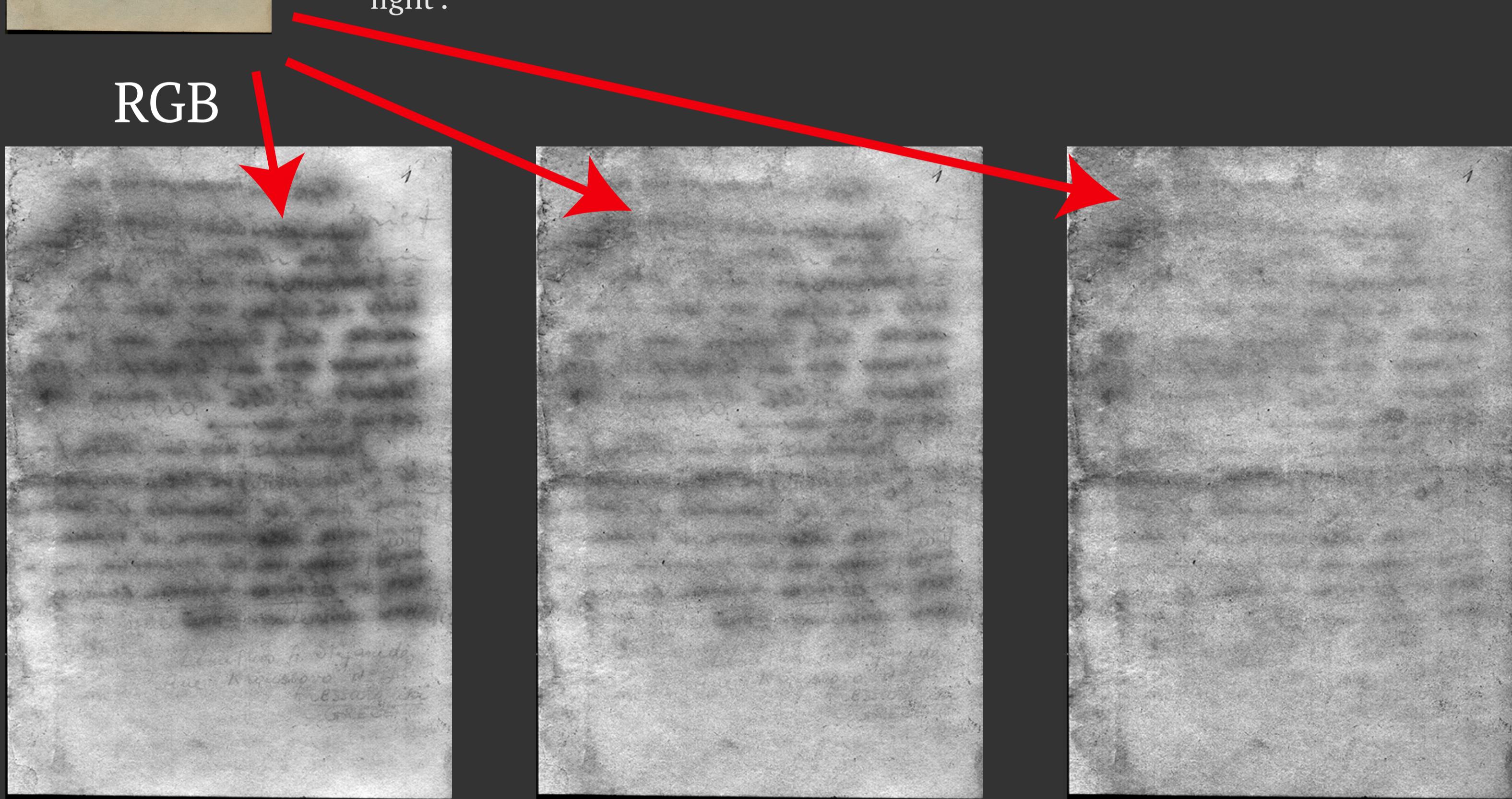


# Channel analyze

The first page of Nadjary manuscript

Basic preview. I skip operation with changing Curve (exposure) filter. We will use it when the document is not so contrast for screen.

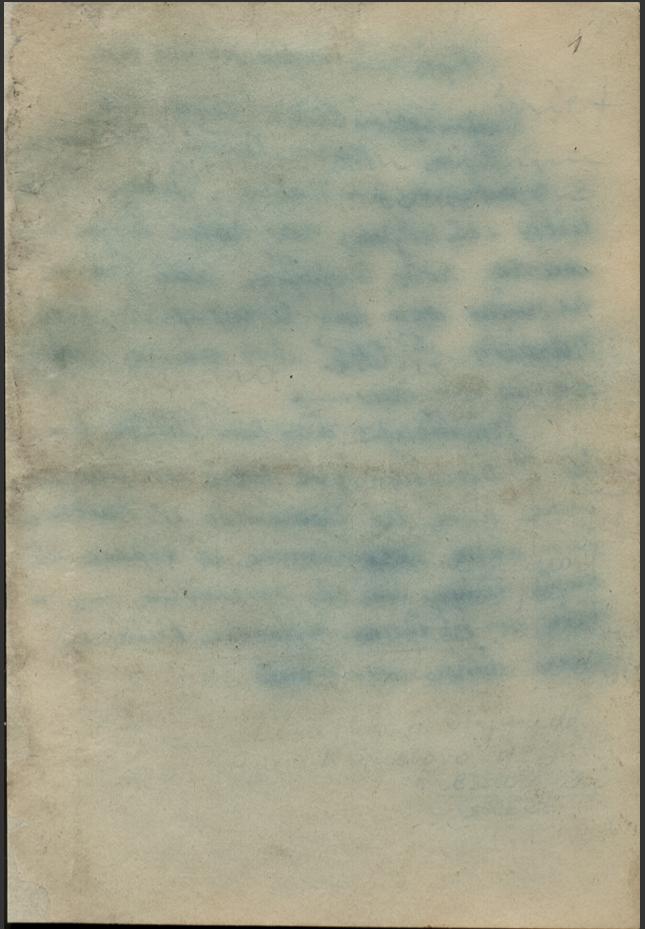
Color scan was got from flatbed scanner and consists of 3 different grayscale images. All channels show different readability. In our case readability is improving from BLUE to RED . It means manuscript has a big potential under Infra Red light .



Red

Green

Blue



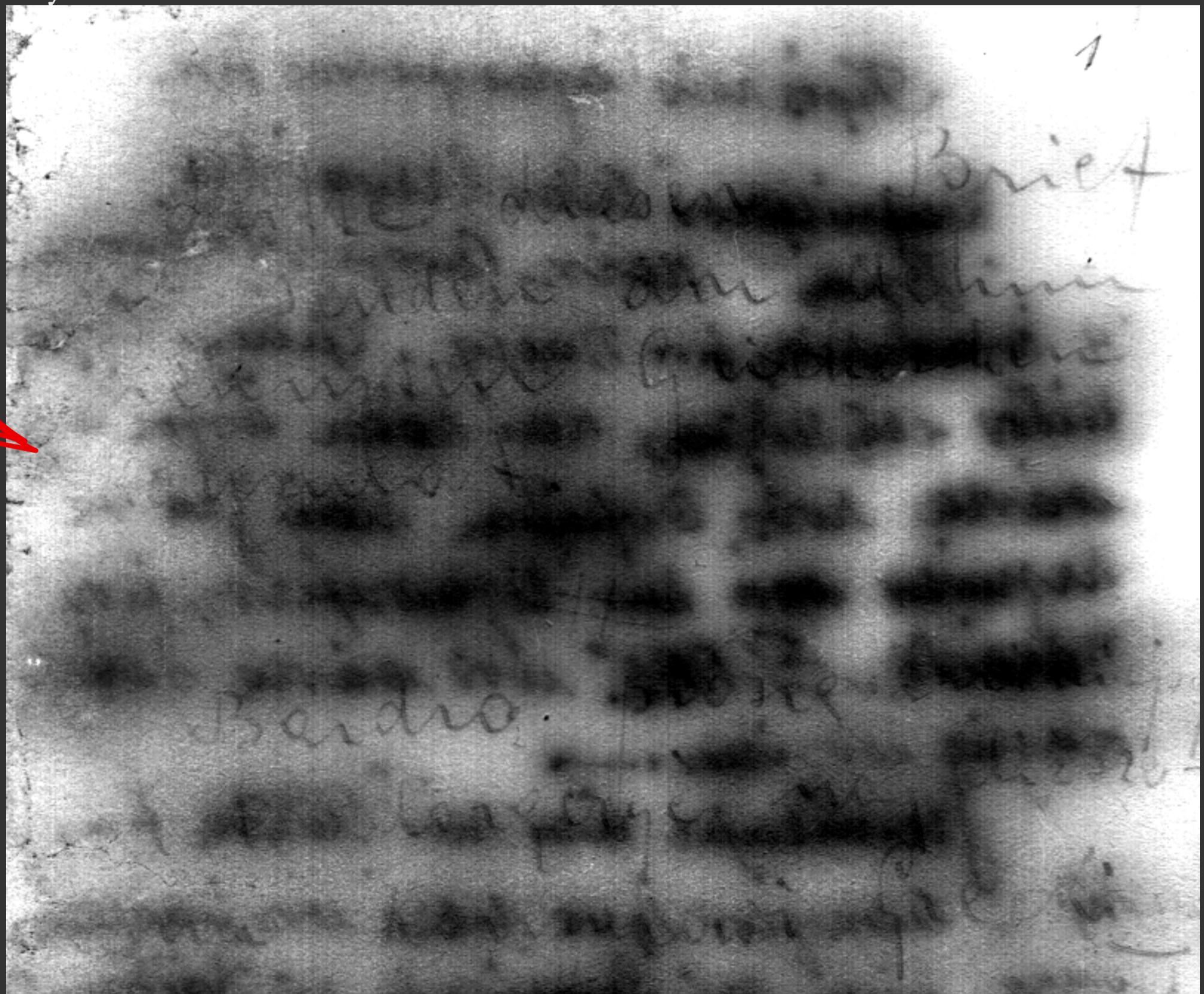
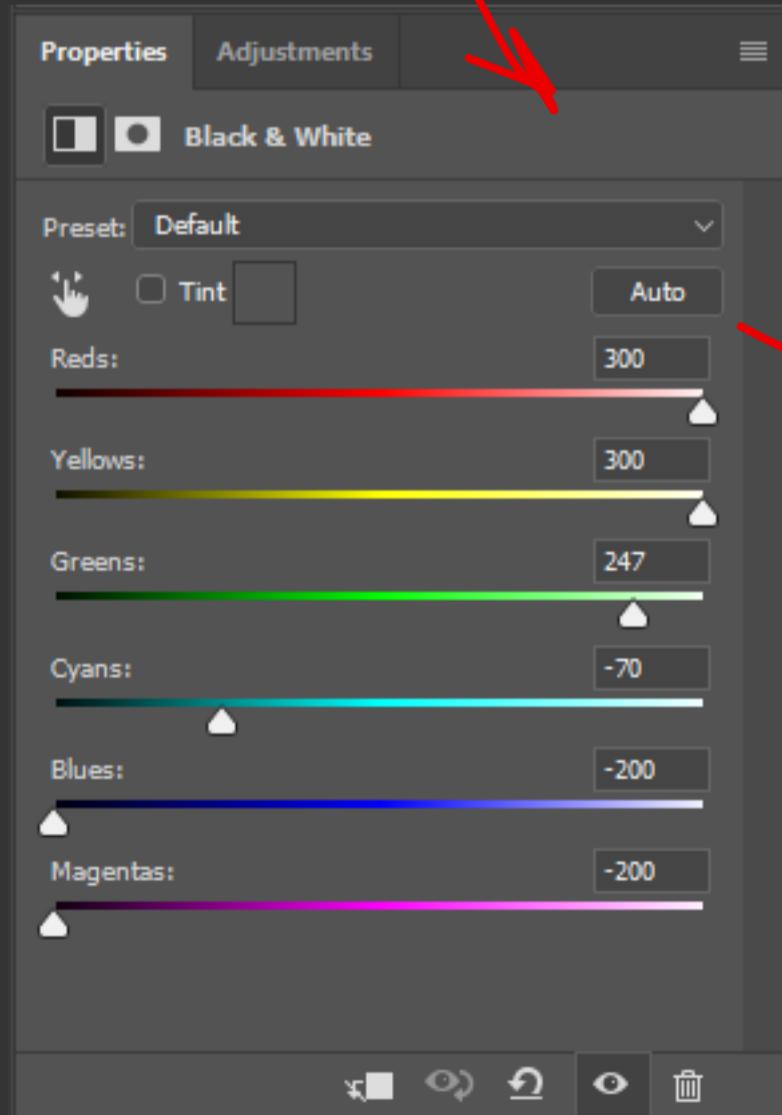
# Black&white filter

The first page of Nadjary manuscript

Channels show only 3 variations of manuscript. And all they consist of wanted information and noise.

Black&White filter was created for conversion color photographs to BW. This filter allows change contrast for every wavelength (color) in visible range (RGB image).

We can select wanted information and remove useless artefacts. In this case manuscript looks much better. But very dark spots and highlights still make readability difficult.

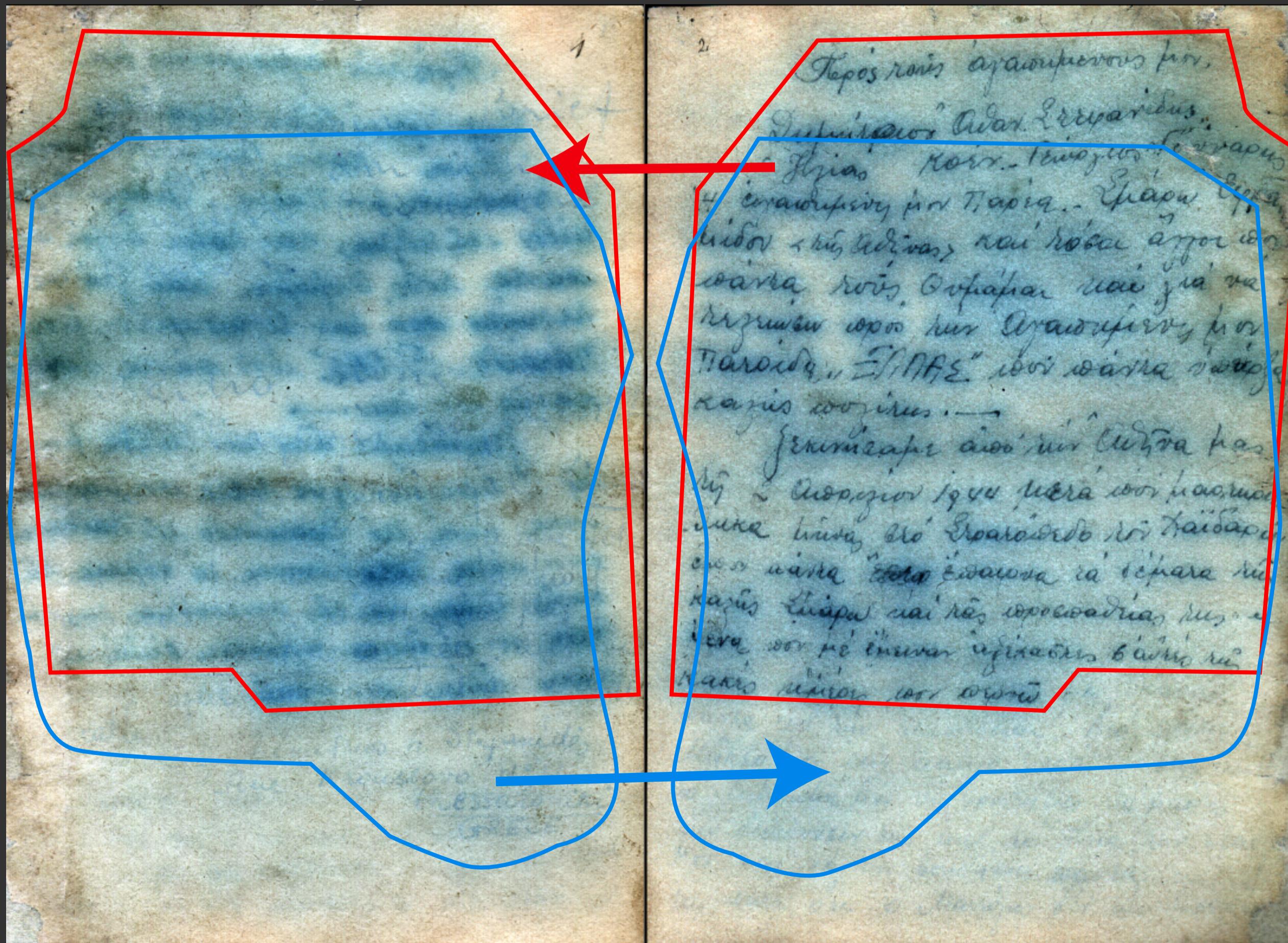


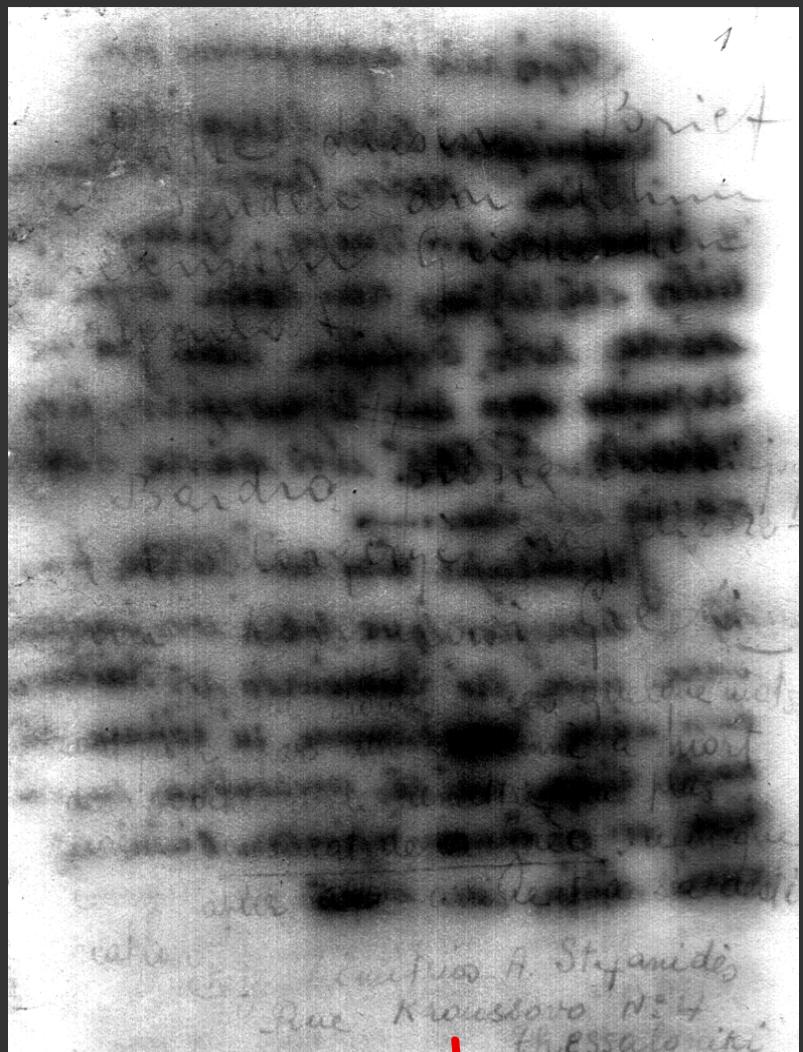
# Removing backside ink

The first and second pages of manuscript

Using of filters are finished. We must think about the nature of other artifacts and how we can find some mask that helps us to subtract it from wanted information. Nature of ink artifacts is ink from backside. If we have a noise (ink from backside) without wanted information, we can use the noise as mask.

All pages have ink backside artefacts. Page 2 will be as mask for page 1 and vice versa when we will work with the second page.

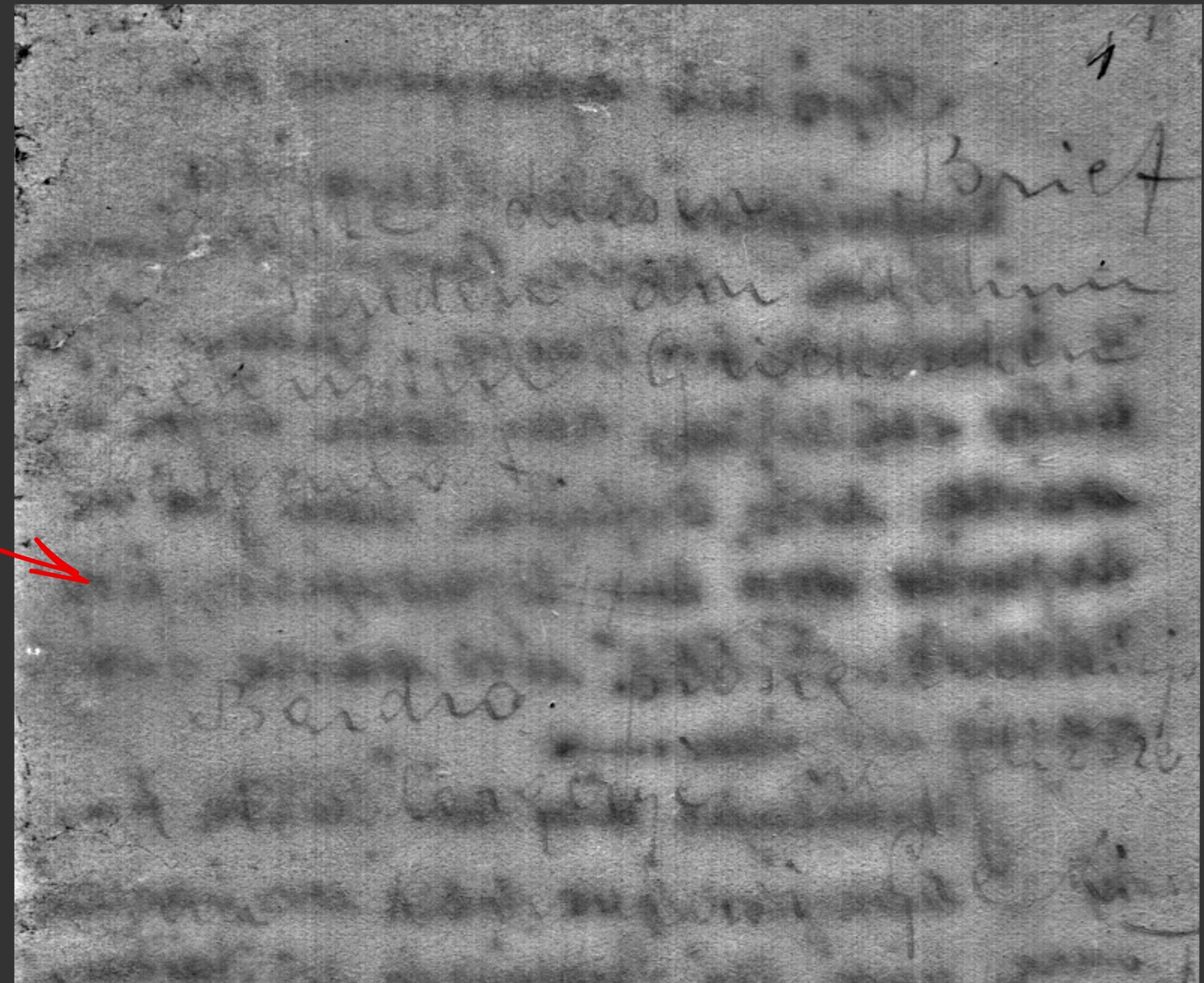
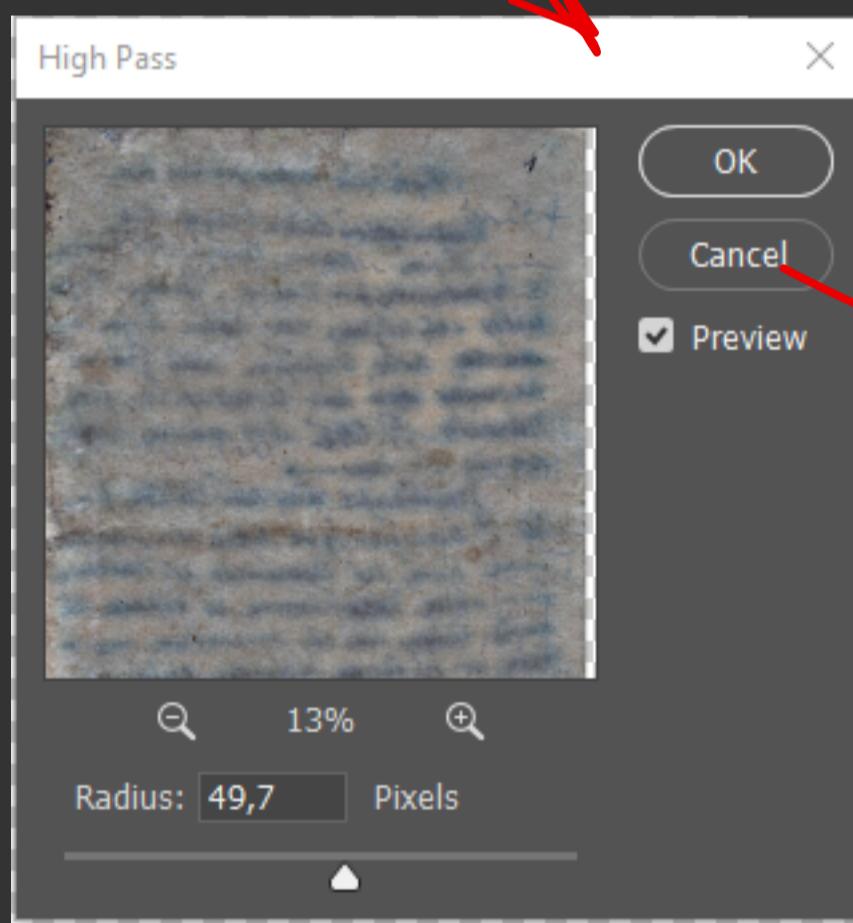




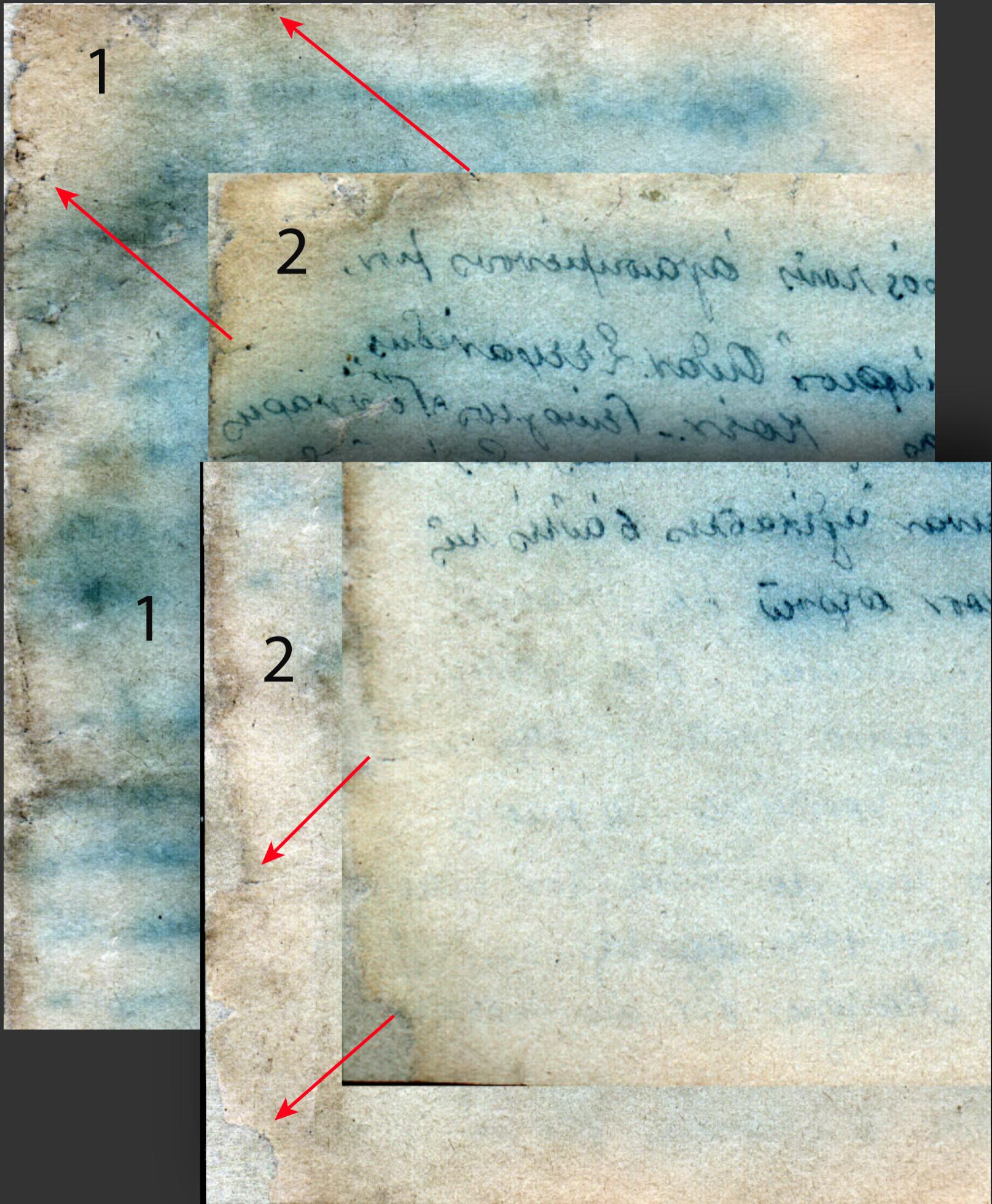
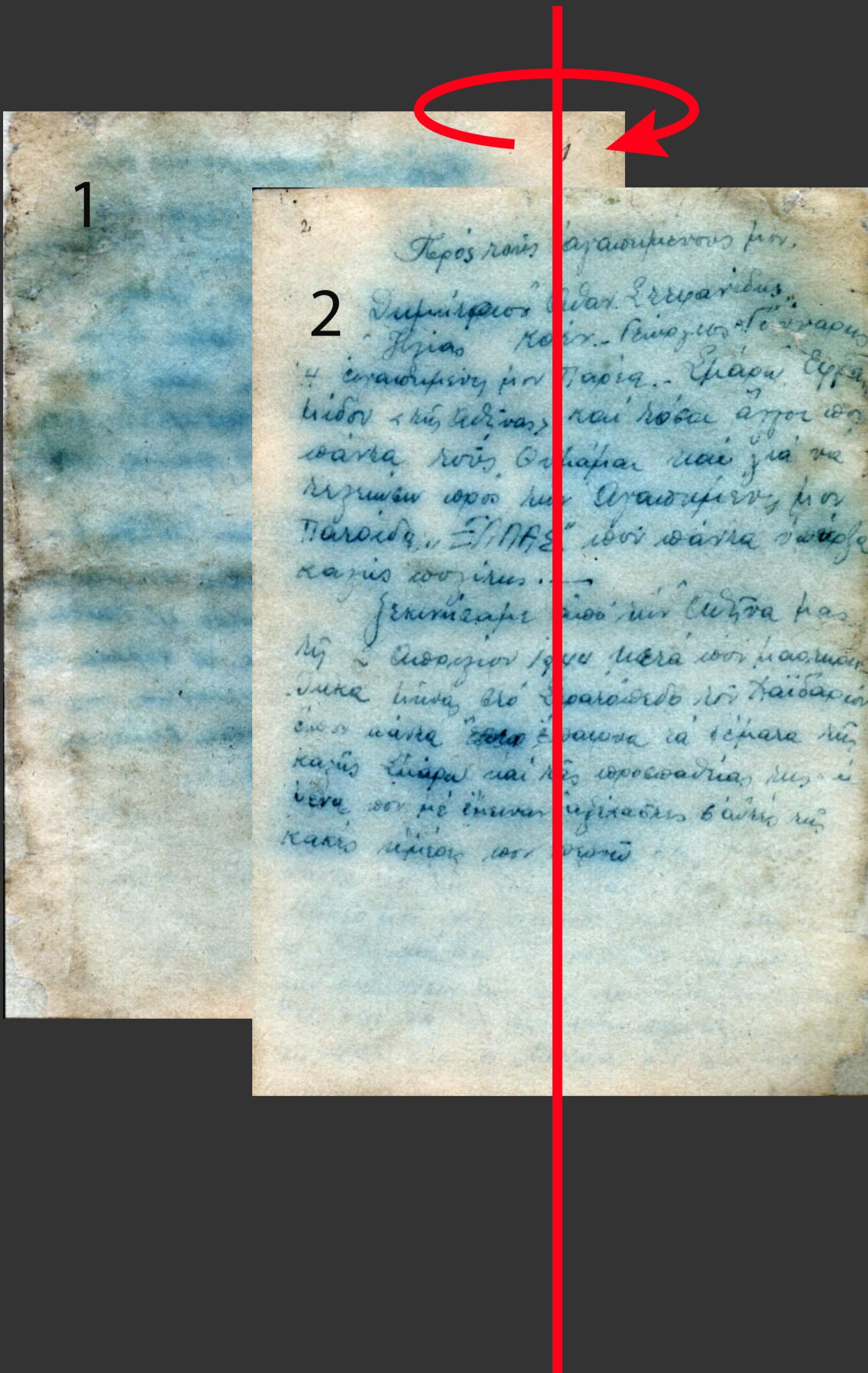
# HighPass filter

The first page of Nadjary manuscript

HighPass filter was created to compress difference between darken and lighten areas. In this case manuscript looks better and we can see new details. And we still see many artefacts on paper and ink from backside. At this step I can't imagine what other filters can help us.

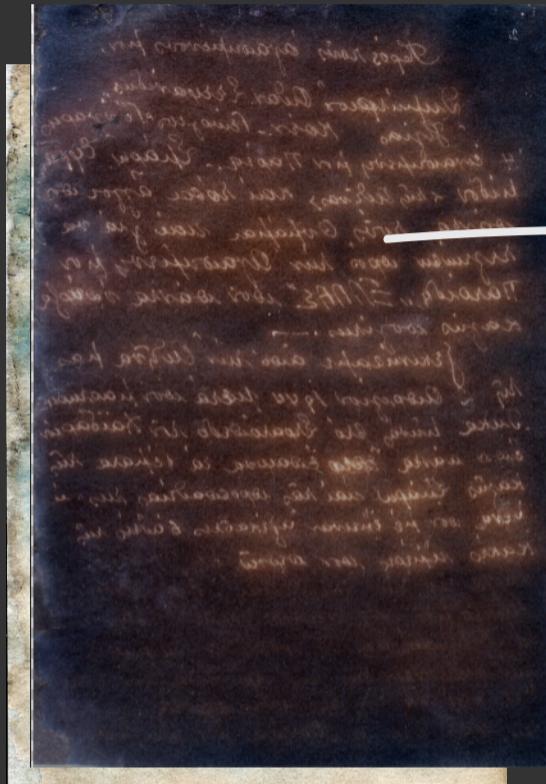


We reflect backside image in mirror transform (2) and find perfect position with the first page (1). We must find pixels what match pixels from backside.  
We should change scale and rotation.

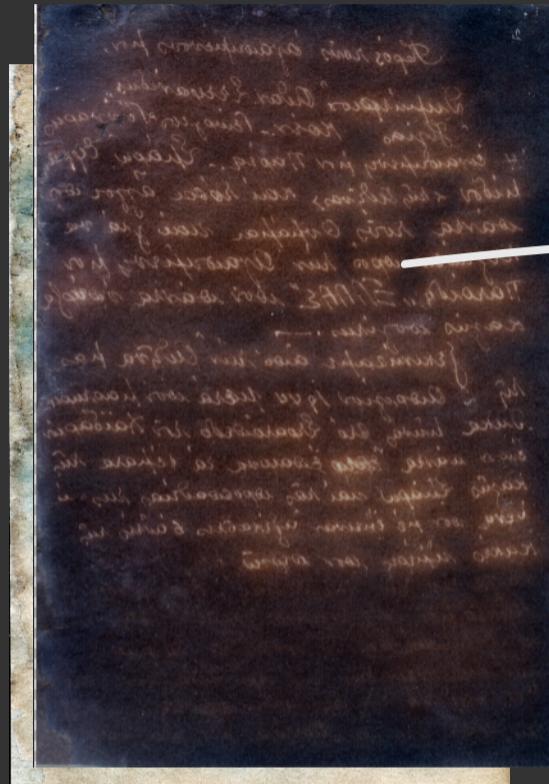


After matching pages (backside image is in upper position now) we must create mask for subtraction.

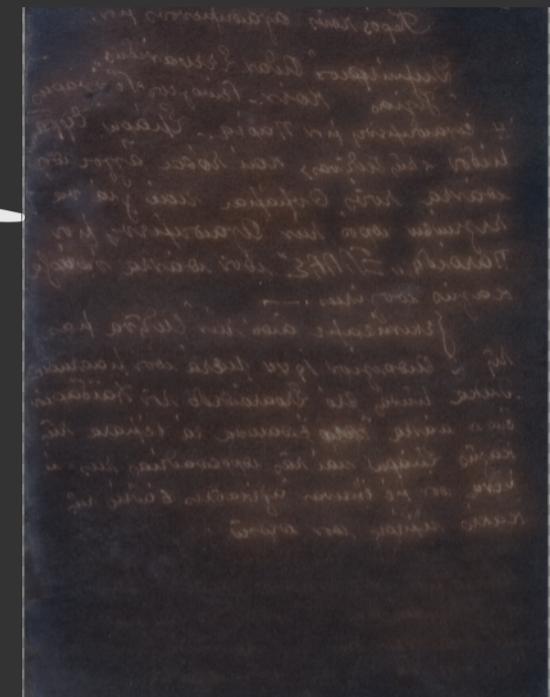
1. Invert colors of upper layer
2. Simulate blurred ink with Gaussian Blur filter with HighPass combination
3. Set opacity to 50%.



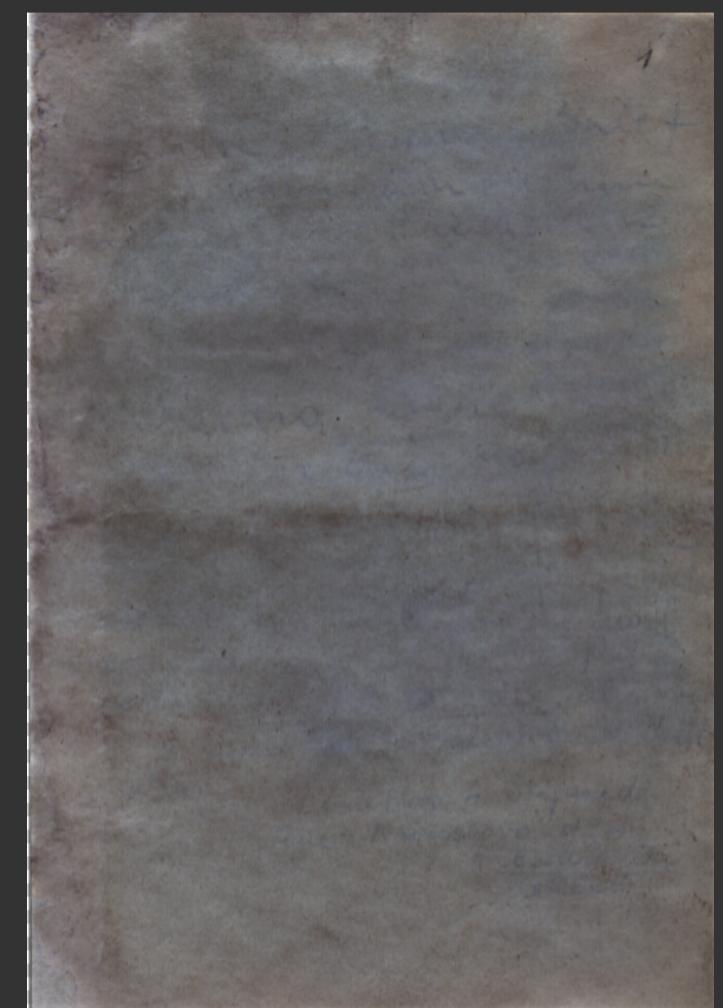
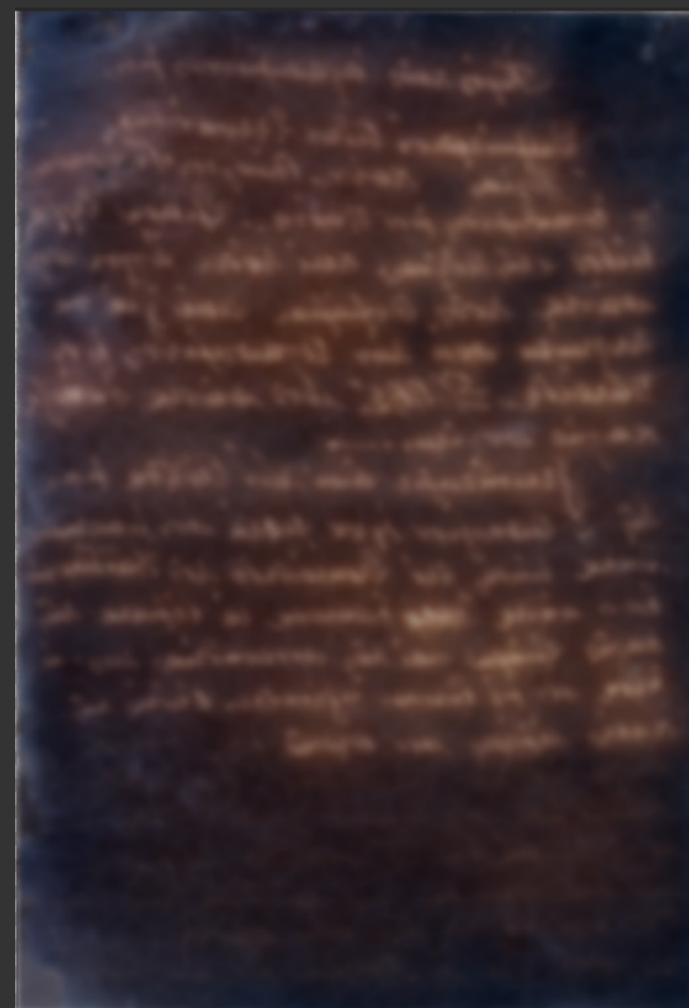
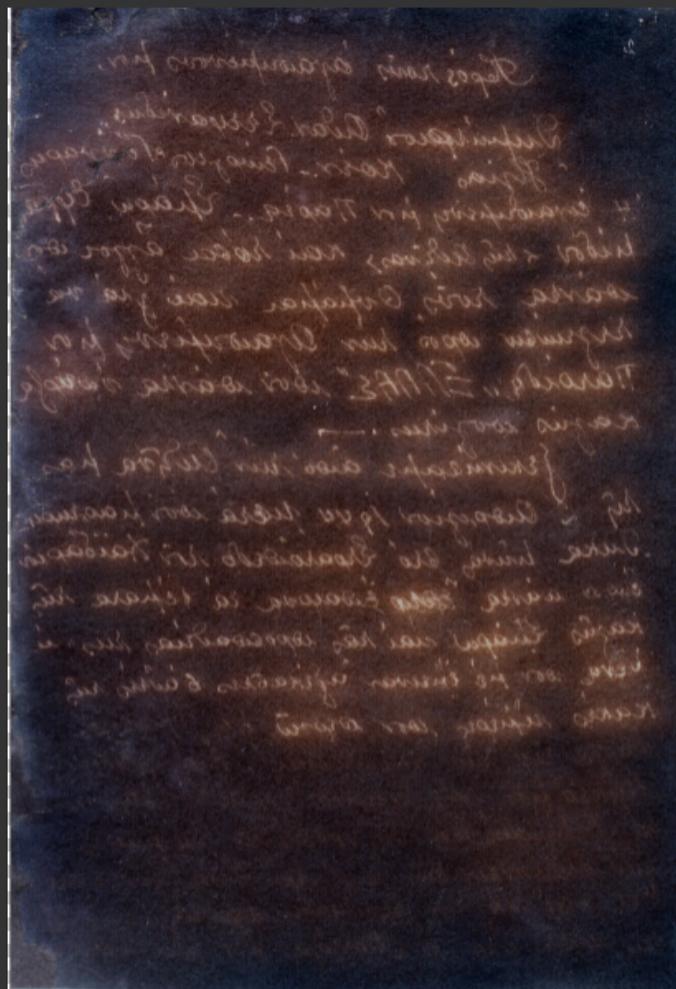
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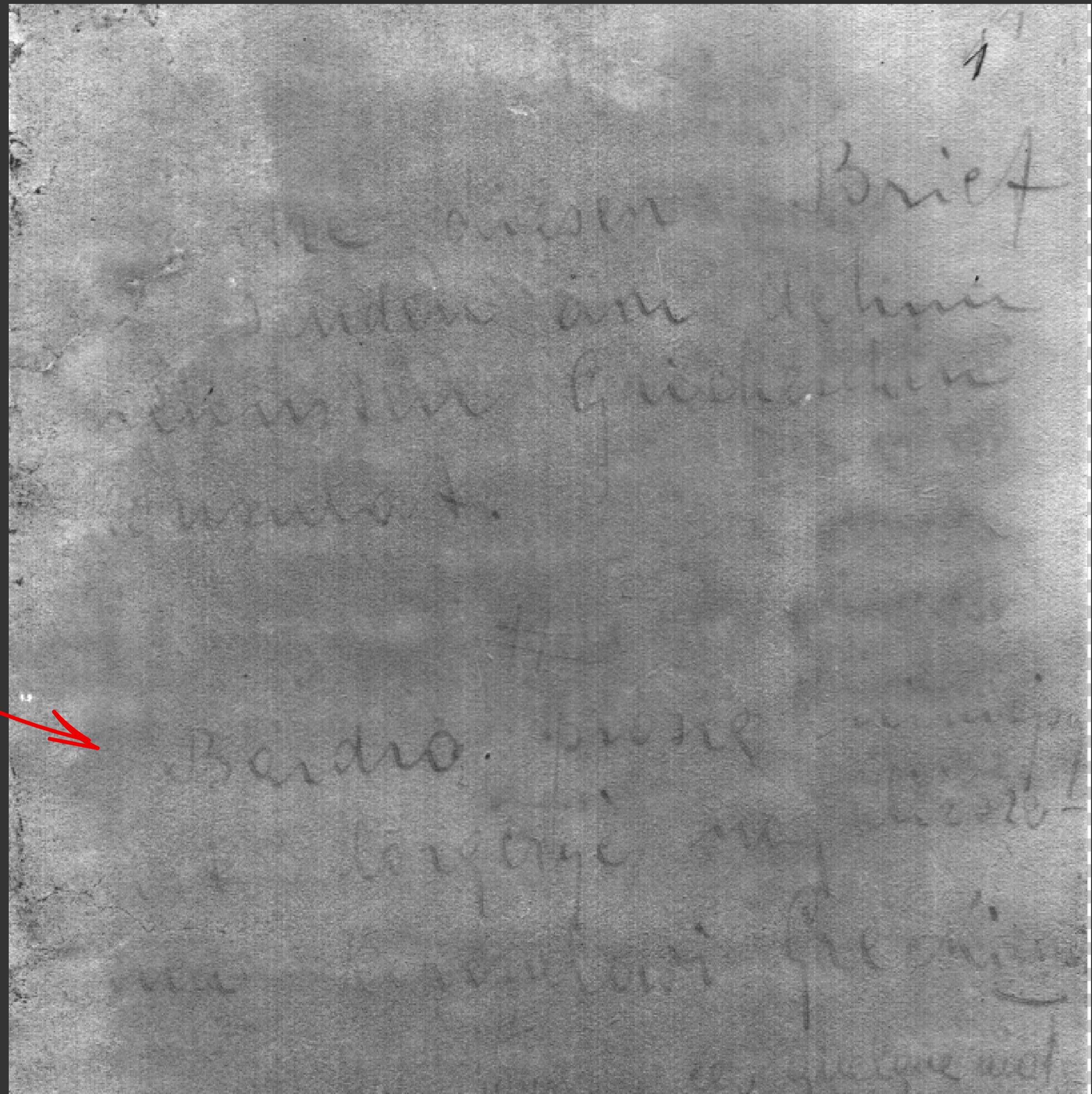
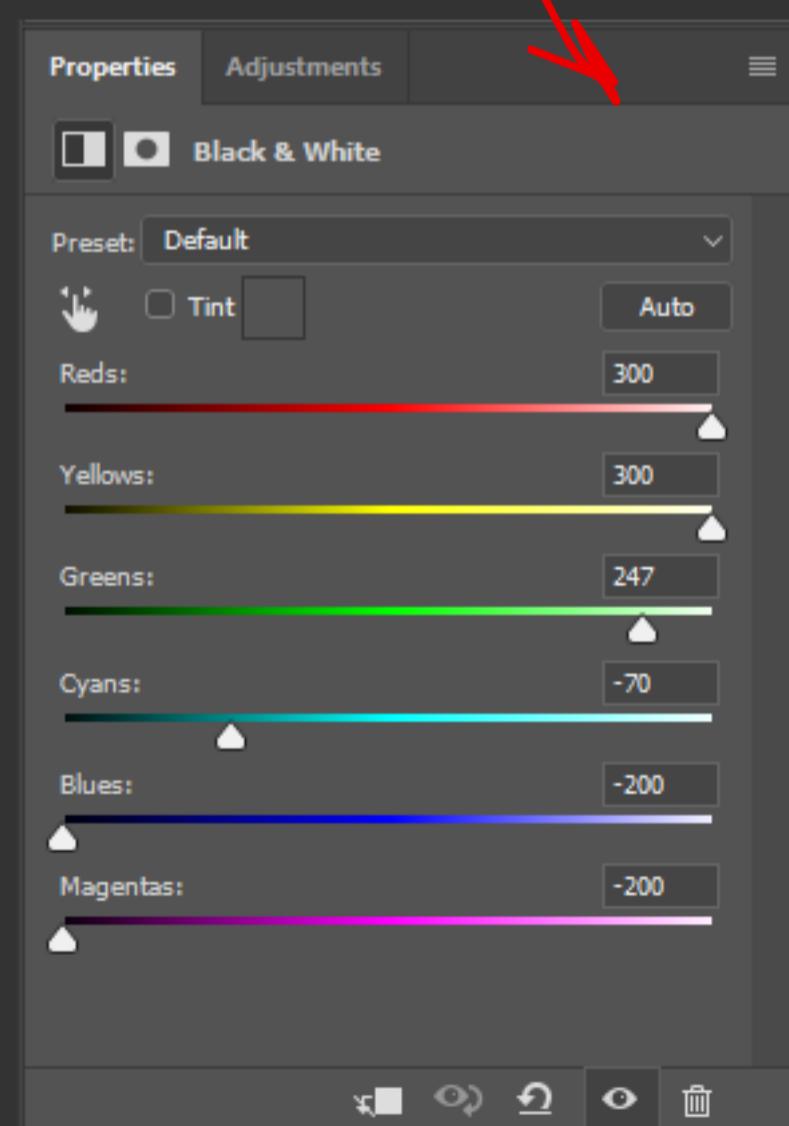
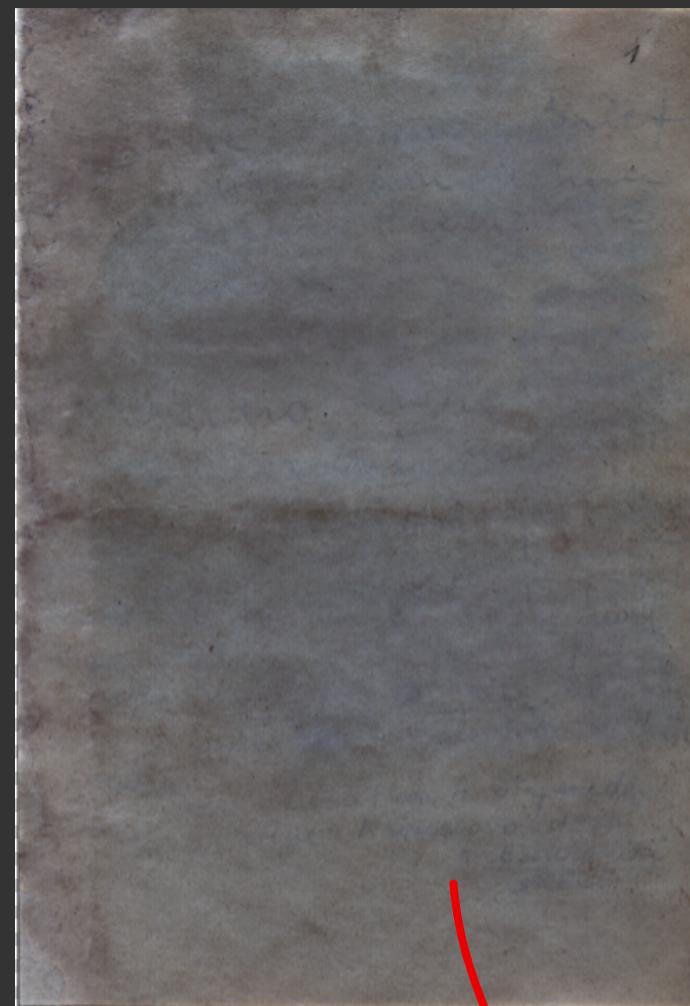
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Apply Black&White filter. Inverted layer can be additionally filtered with HighPass.  
We remove most of backside inks succesfully.



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