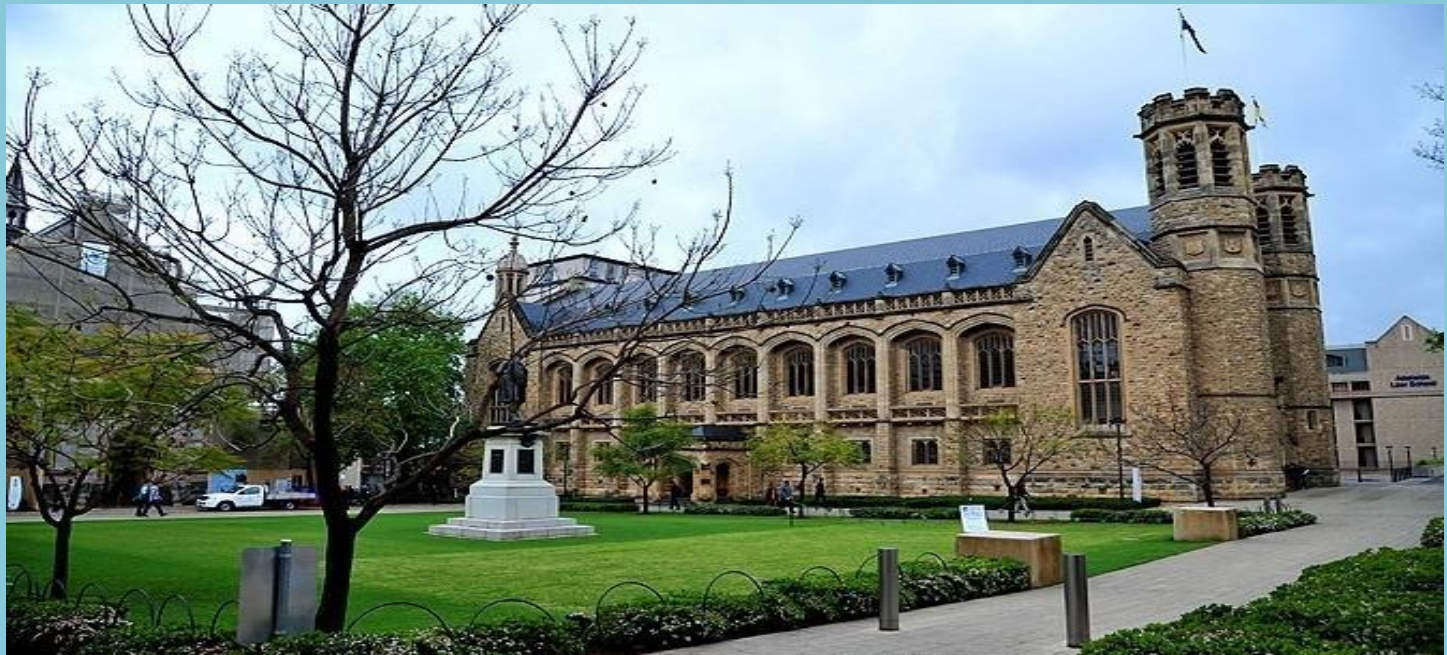




THE UNIVERSITY  
*of* ADELAIDE



# 2016 Masters project 141

## Cracking the Voynich manuscript code

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# Outline

- ✓ The Voynich manuscript (background and history)
- ✓ Literature view
- ✓ The project 141
- ✓ Phase 1: Text investigation
- ✓ Phase 2: Illustrations research
- ✓ Phase 3: Marginal symbols investigation
- ✓ Conclusions
- ✓ Applications

# The Voynich manuscript (background and history)



Wilfrid Voynich (1865-1930)

- Born in Telsze in Polish.
- In 1912, the Voynich manuscript was found.
- In 1914, he brought the manuscript to New York.

[https://en.wikipedia.org/wiki/Voynich\\_manuscript#/media/File:Micha%C5%82\\_Wojnicz\\_c.\\_1885.png](https://en.wikipedia.org/wiki/Voynich_manuscript#/media/File:Micha%C5%82_Wojnicz_c._1885.png)

# The Voynich manuscript



- ✓ About 240 pages remaining.
- ✓ folios, numbered from f1 to f116.
- ✓ Each folio have two pages, r and v.

[https://en.wikipedia.org/wiki/Voynich\\_manuscript#/media/File:Voynich\\_Manuscript\\_\(170\).jpg](https://en.wikipedia.org/wiki/Voynich_manuscript#/media/File:Voynich_Manuscript_(170).jpg)

# Six sections

## Herbal section



[http://www.voynich.nu/q02/f016v\\_crd.jpg](http://www.voynich.nu/q02/f016v_crd.jpg)

## Astronomical section



[http://www.voynich.nu/q09/f067r1\\_crd.jpg](http://www.voynich.nu/q09/f067r1_crd.jpg)



## Cosmological section



[http://www.voynich.nu/q10/f069v\\_crd.jpg](http://www.voynich.nu/q10/f069v_crd.jpg)

## Biological section



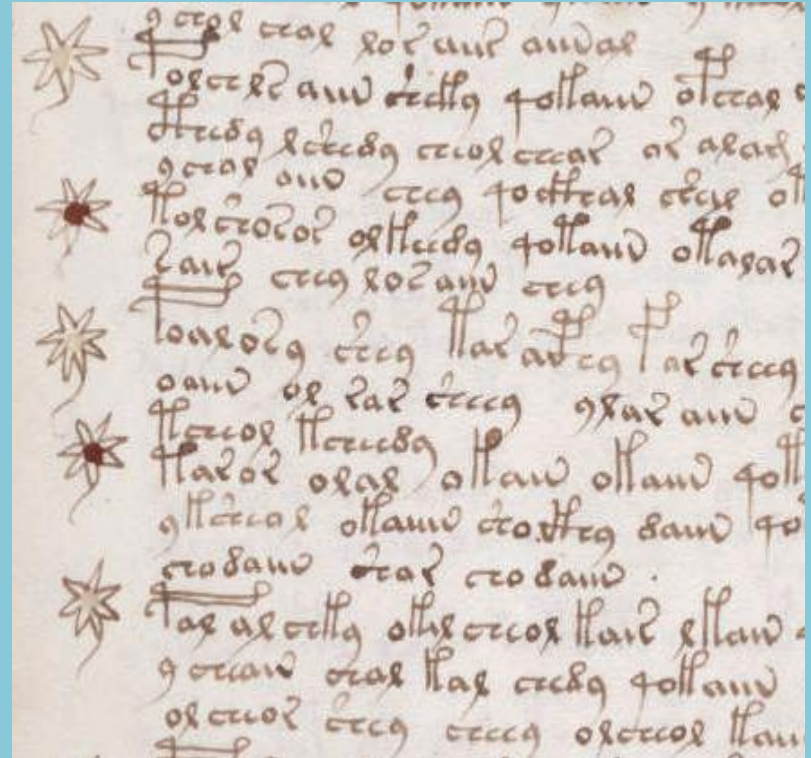
[http://old.world-mysteries.com/sar\\_13.htm](http://old.world-mysteries.com/sar_13.htm)

## Pharmaceutical section



[http://www.voynich.nu/q15/f089r2\\_crd.jpg](http://www.voynich.nu/q15/f089r2_crd.jpg)

## Recipes section ( marginal stars)



<https://cogitz.wordpress.com/2009/09/14/the-mysterious-voynich-manuscript/>

# Literature review

Researcher	Conclusion
John Tiltman Friedman <sup>[1]</sup>	Artificial language.
Feely <sup>[2]</sup>	1943, Latin.
The first study group (FSG) <sup>[3]</sup>	1946, transcription alphabet.
Takahashi <sup>[4]</sup>	Transcription



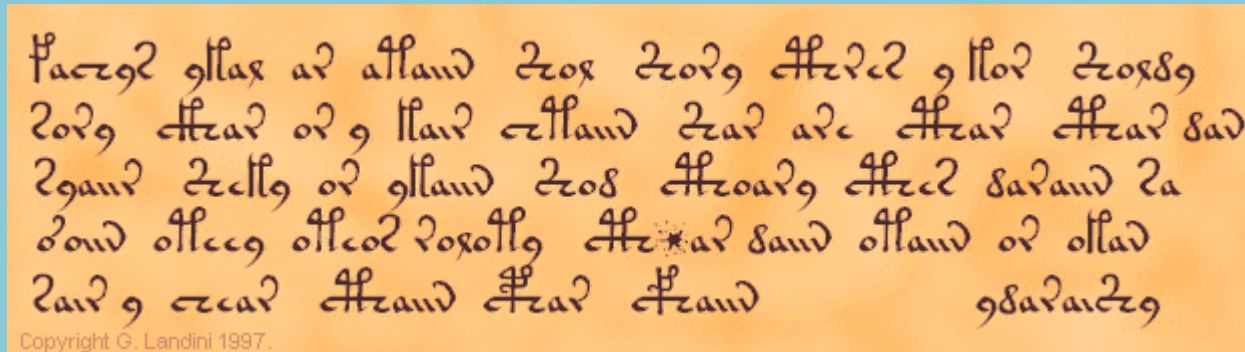
# The Project 141

- ✓ **Perspective:** possible written numbers.
- ✓ **3 phases:** text investigation, illustrations research, marginal symbols research.

\* Because of the massive number of words and illustrations in the Voynich manuscript, the aim of this project is not solve the whole Voynich manuscript.

# Phase 1: Text investigation

## The Voynich manuscript



<http://www.voynich.nu/analysis.html>

## Takahashi Version

fachys ykal ar atain Shol Shory cThres y kor Sholdy  
sory cThar or y kair chtain Shar are cThar cThar dan  
syair Sheky or ykain Shod cThoary cThes darain sa  
o'oiin oteey oteor roloty cTh\*ar daiin otain or okan  
sair y chear cThain cPhar cFhain ydaraiShy

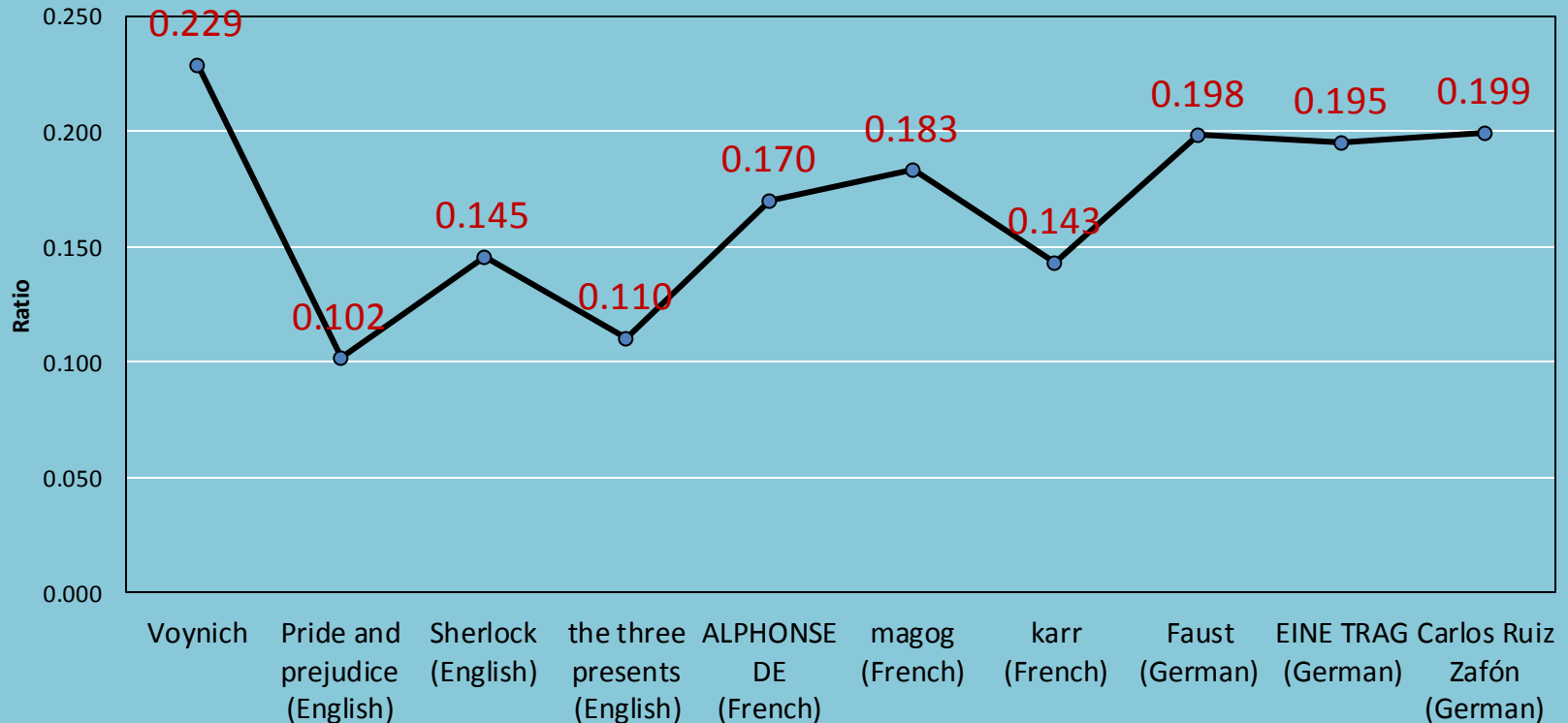
## Text investigation:

Use the **MATLAB** to deal with the features of the text.

- ✓ The number of **words**.
- ✓ The people's **writing habits**: the length of words, the occurrence frequencies of unique words.
- ✓ **Compare** the Voynich manuscript with other known languages.

# Text investigation: analysis

## Unique words/total words



## Difference

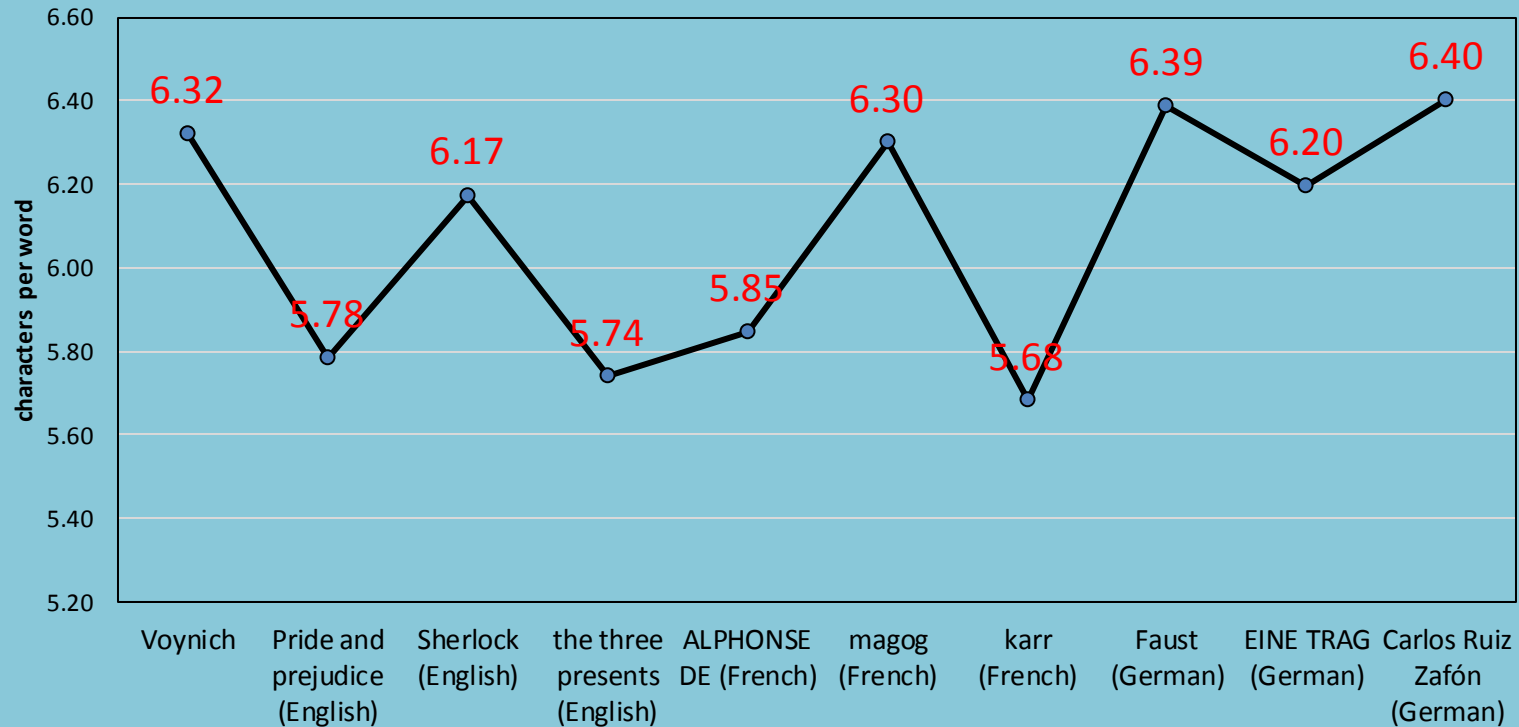
Voynich VS English: **47.9%**

Voynich VS French: **27.7%**

Voynich VS German: **13.6%**

# Text investigation

## word length



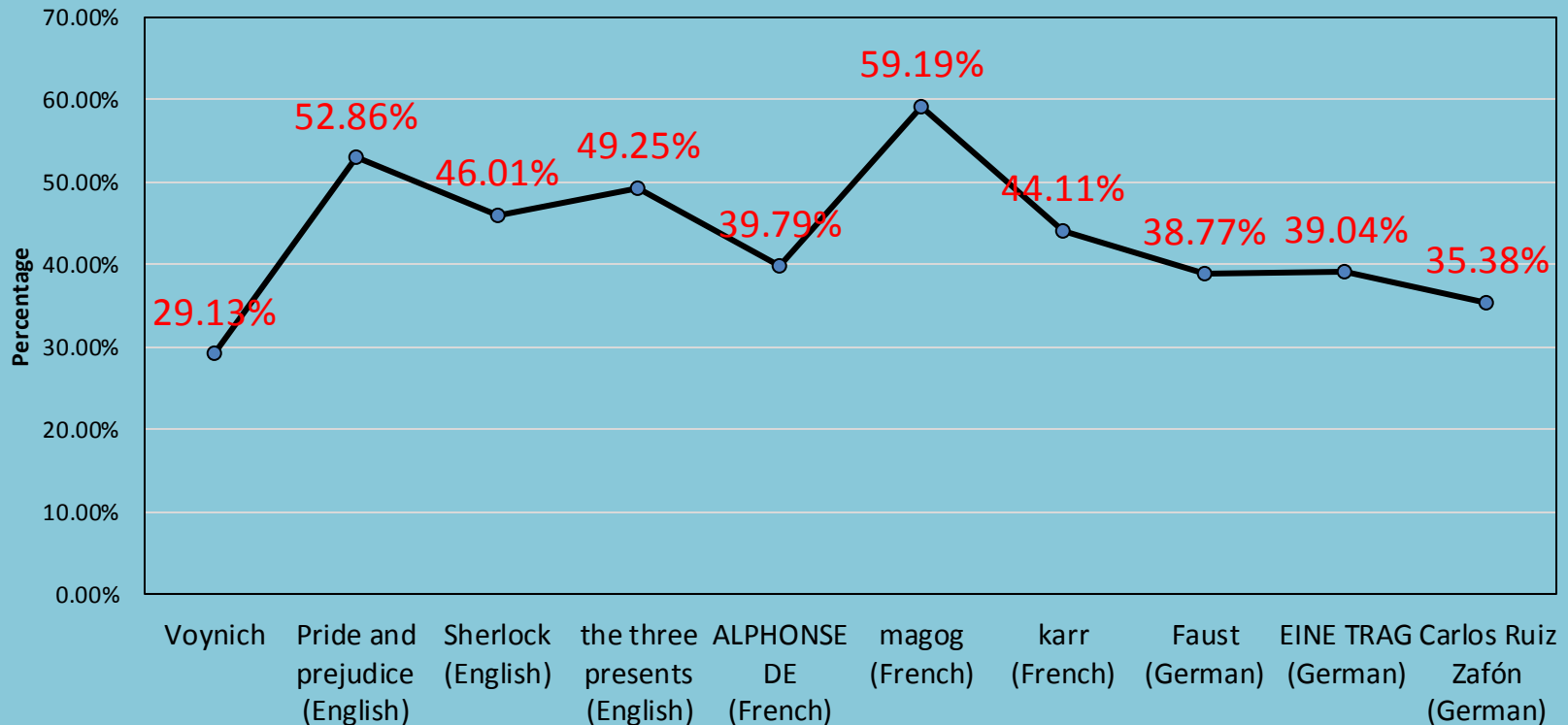
## Difference

Voynich VS English: **6.7%**    Voynich VS French: **6.0%**    Voynich VS German: **0.1%**



# Text investigation

words appear > 1/total unique words



## Difference

Voynich VS English: **41.0%**    Voynich VS French: **38.9%**    Voynich VS German: **22.8%**

# Text investigation: conclusion

The most possible language which the author of the Voynich manuscript used is German.

# Phase 2: Illustrations research

- ✓ Numbers in pictures
- ✓ Potential digits



[http://old.world-mysteries.com/sar\\_13.htm](http://old.world-mysteries.com/sar_13.htm)

# Illustrations investigation: Analysis

letter	number	frequency
o	1	24
	2	20
	3	16
	4	14
	5	12
ol	10	14
	13	12
	12	11
	11	9
or	10	19
	12	13
	13	12

os	19	11
	12	4
	13	4
r	1	48
	2	26
	3	21
	5	19
	4	14
	2	54
s	1	46
	3	41
	5	32
	2	36
y	1	30
	3	29
	5	20
	2	36

# Illustrations investigation: Conclusion

## The most possible relationship

- **'o' and '1'**
- **'ol' and '13'**
- **'or' and '13'**
- **'r' and '1'**
- **'y' and '2'**
- **'s' and '2'**
- **'os' and '19'**

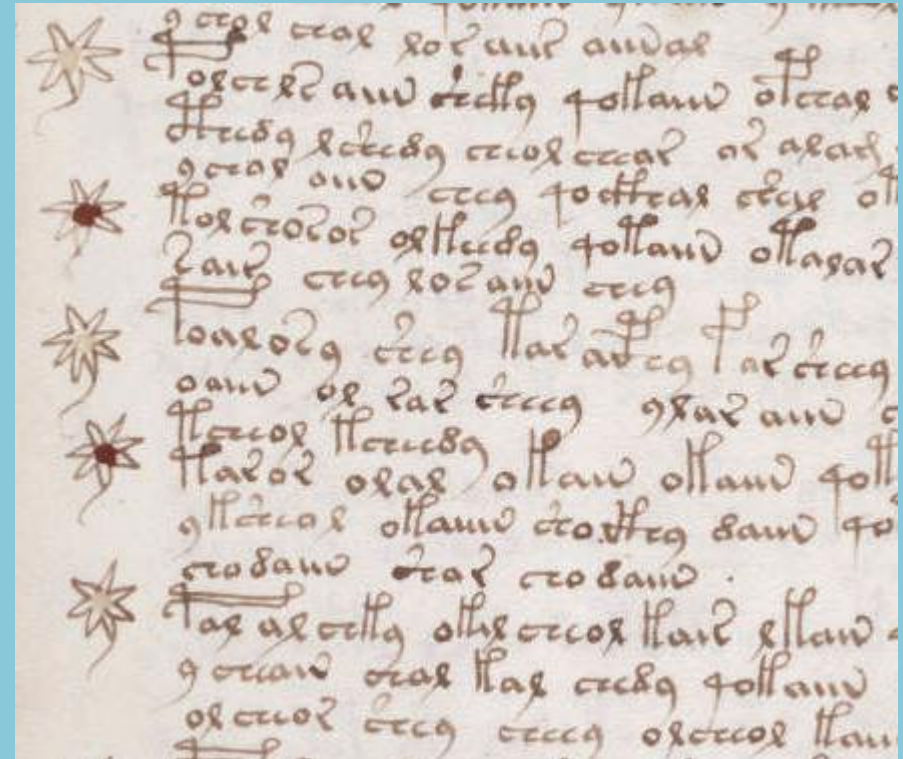
## Possible relationship

- **'r' and '2'**
- **'ol' and '10'**
- **'ol' and '12'**
- **'or' and '10'**
- **'or' and '12'**
- **'s' and '1'**
- **'s' and '3'**
- **'y' and '1'**
- **'y' and '3'**



# Phase 3: Marginal symbols investigation

- ✓ Count the number of symbols for each page.
- ✓ Search potential digits from the text.



<https://cogitz.wordpress.com/2009/09/14/the-mysterious-voynich-manuscript/>

# Marginal symbols investigation: Analysis

letter	Pages	Digit	Occurrence pages	frequency					
y	18	5	3	16.67%	s	10	6	4	40%
		6	7	38.89%			7	3	30%
		7	10	55.56%	o	8	6	4	50%
		8	5	27.78%			8	2	25%
l	13	7	7	53.85%			9	2	25%
		8	4	30.77%			ar	22	10
		9	2	15.38%	12	3			13.64%
or	17	10	3	17.65%	13	6			27.27%
		13	5	29.41%	15	3			13.64%
ol	21	12	3	14.29%	al	21	10	4	19.05%
		13	5	23.81%			13	6	28.57%
		15	4	19.05%			14	2	9.52%
								15	4

# Marginal symbols investigation: Conclusion

## The most possible relationship

- **'y' and '7'**
- **'or' and '13'**
- **'ol' and '13'**
- **'o' and '1'**
- **'a' and '1'**
- **'s' and '6'**
- **'l' and '7'**

## Possible relationship

- **'ar' and '13'**
- **'ar' and '10'**
- **'al' and '15'**
- **'al' and '13'**
- **'al' and '10'**
- **'ol' and '15'**
- **'y' and '6'**
- **'y' and '8'**
- **'l' and '8'**
- **'o' and '6'**

# Conclusions

Text investigation:

The language which is used in the Voynich manuscript may be a branch of German.

Illustrations and marginal symbols investigation:

The possible relationship	
Characters	Digits
<b>s</b>	<b>2 and 6</b>
<b>y</b>	<b>2 and 7</b>
<b>a</b>	<b>1</b>
<b>r</b>	<b>1</b>
<b>os</b>	<b>19</b>
<b>l</b>	<b>7</b>
The most possible relationship	
<b>o</b>	<b>1</b>
<b>ol</b>	<b>13</b>
<b>or</b>	<b>13</b>

# Applications

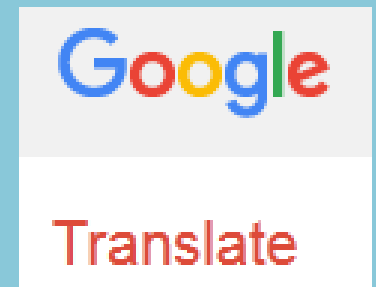
✓ Data analysis.



✓ Statistics.



✓ Information Theory.





# References

- [1] Tiltman, John, “The Voynich Manuscript, The Most Mysterious Manuscript in the World”. NSA Technical Journal 12 (July 1967), pp.41-85.
- [2] Feely, Joseph M, *Roger Bacon's Cipher: The Right Key Found*, Rochester, 1943.
- [3] First Study Group (FSG)  
<http://www.voynich.nu/transcr.html>
- [4] René Zandbergen, transcription of the text, 2004 – 2016.  
<http://www.voynich.nu/transcr.html>