

Georg Hermann Valentin

1848-1926

1879

Direktor, Preussischen  
Staats-Bibliothek

1885

1897

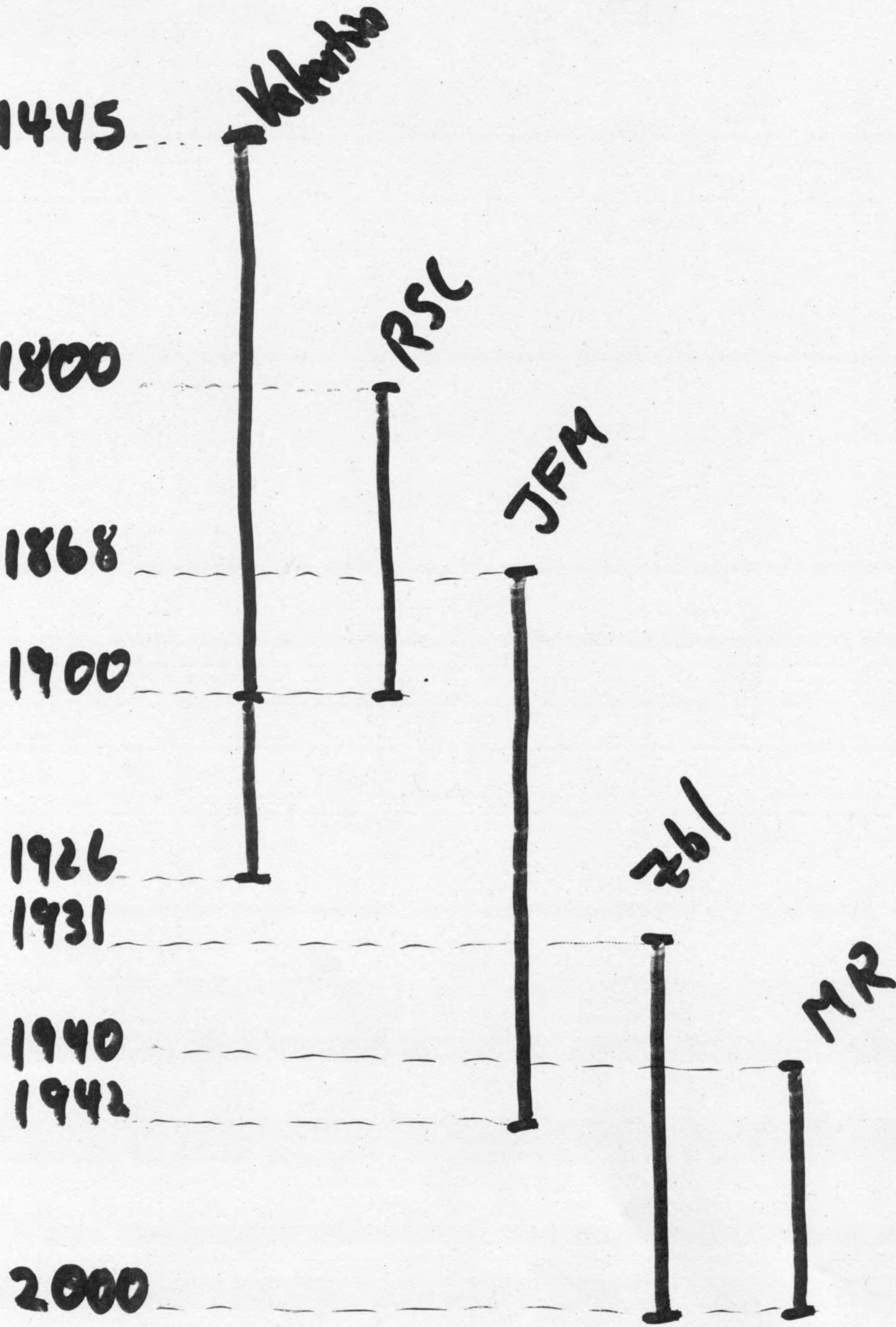
1900

1910

1924 ICM

1928 ICM

1944 February



Valentin	1445 - 1926 :	200,000
	1445 - 1900 :	125,000
RSC	1800 - 1900 :	48,115
JFM	1868 - 1942 :	200,000
	1868 - 1900 :	57,718
Z61	1931 - 2000 :	1,763,000
MR	1940 - 2000 :	1,643,000

1445 - 1900 :	125,000
1900 - 1940 :	150,000
1940 - 2000 :	1,725,000
	<hr/>
	2,000,000

~ 2,500,000

How many pages?

$$2,500,000 \times 20$$

$$= 50,000,000$$

# What is it?

JFM

13%

books

86%

j. articles

1%

theses

Zbl

4.5%

books

MR

4%

books

## The Mathematics Genealogy Project

[conce.math.mankato.msus.edu](http://conce.math.mankato.msus.edu)

~ 35,000 theses

# JFM

1868	892
1869	791
1870	837
1871	1101
1875	1371
1880	1421
1885	1801
1890	2190
1895	2226
1900	2660
1905	—
1910	—
1915	2264
1920	1416
1925	3494
1930	4732

1930	4732	261	
1931		4040	
935	—	4531	MR
1940	~4560	3623	3203
1945		2152	2559
1950		6194	6331
1955		8297	8273
1960		13430	13530
1965		16052	17139
1970		26629	23583
1975		36793	33976
1980		46391	42938
1985		47786	48708
1990		54147	55889
1995		62573	59887

What is a

GLOBAL

MATHEMATICS

LIBRARY ?



Where is it?

IN MY POCKET!

so a central location  
with lots of mirrors

reality

Distributed

fees, access controls,

problems:

standards,  
protocols,

# I. Database

Math DOI

World Math Catalogue

Merge:

0

online

1

Reviewing journals

JFM

Revue Semestrielle

Zbl

MR

RZM

# 2 Bibliographies

RSC

ICSL

Reputaire Bibliographique

+ others

# 3 Library catalogues

# 4 Thesis lists

UMI

...

# 5 Gray literature

⋮

Beughem, Bibliographia mathematica  
Amsterdam 1685, 688 526

Deniker, Bibliographie des travaux  
scientifiques 888 v 2

Erlecke, Bibliotheca mathematica  
873 307 pp

Biereus de Haan Bibliographie  
neerlandaise .. 883

Müller, Repertorium der mathematischen  
Literatur 822 1825

Murhard, Literatur der mathematischen  
Wissenschaften 5 vol. 1797-1805

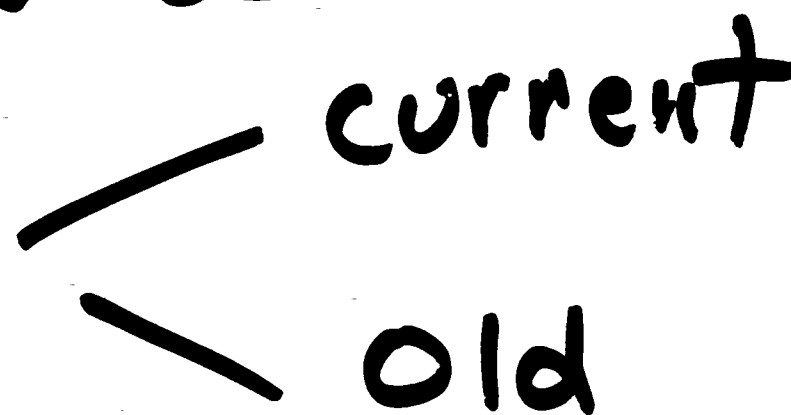
Okamoto, A catalogue of Japanese  
mathematical literature, 1931,  
822 pp.

Reuss, Repertorium Commentationum  
6 vol, 1801-1821 (math is vol 7)

Wölffing, Mathematischer Bücherschatz  
... 1903

Zebrawski, Bibliografija ...  
... matematyki i fizyki... 1873  
617 pp.

# II Data

Journals  current  
old

Books

Theses

Preprints

# III

Links

to what?

IV

People

World Directory

CML

Society memberships

Dept. web pages

Poggendorf

# EVERYTHING!

online versions

library catalogue

JFM, MR, Zbl

journal reviews

citations

user comments

author information

..



# ADS

## Astrophysics Data System

adswww.harvard.edu

Michael Kurtz

NASA funded

publisher permission

# Search Features

boolean

word / phrase

proximity

pattern matching

fielded

author

title

date

subject

mathematical symbols ?

concepts ?

# Results

meta data (Bibtex)

read — translate

print

compute

verify

math metadata ?

private/public annotation

Napster

Docster

Genomster

Mathster ?

# JSTOR

www.jstor.org

|| complete math journals  
( Am Math, AJM, TAMS, ANM,  
SIAM, JSL, .. )

|| complete statistics journals

+

General Science Collection:

RSL

Philos. Trans. Math., Physical ...  
1665 -

Proc. Math  
1800 -

Proc. Nat. Acad. Sci  
1915 -

# AIM

[www.aimath.org](http://www.aimath.org)

library

scanning operation

support

physical institute

# Project Euclid

Cornell

math resources :

- online scanned math books
- mirror zbl MATH
- \* grant from Mellon Foundation to support independent math journals

# Math Books

Cornell Göttingen - Michigan

DFG - NSF

scan + distribute

Cornell: 571 + OCR

Göttingen: 500? OCR?

Michigan: 1000 + OCR



# Where to go now?

some small steps

## 1 Coordination

Web site

Mailing list

projects

funding

partnerships

Databases

books  
journals  
theses

Mirror

# 2 Direction

International committee

suggest priorities

establish standards

coordinate/negotiate with

publishers

societies

libraries

granting agencies/  
foundations

3 Establish an international digitization project for math

Economics:

Cornell \$10,000/year  
(= 4% math acq budget)

100 partic pants

→ \$1,000,000/year

What does it buy

$$\frac{1,000,000}{2} = 500,000 \frac{\text{pages}}{\text{year}}$$

for Cornell

$$\frac{10,000}{500,000} = \$0.02/\text{page}$$

# Current publication costs

Rehmann table in Bielefeld:

[www.mathematik.uni-bielefeld.de/~rehmann/BIB/](http://www.mathematik.uni-bielefeld.de/~rehmann/BIB/)

1999            246    major journals

323,786 pages

\$173,552

~ \$50/page

Crelle's Journal

1826 —

1st 500 vol. 133,931

Duke Math. J.

1935 —

79,064

Michigan Math. J.

1950 —

20,302

# 4. World Math Catalogue

Pilot Project

1930—1950

Merge

JFM

Zbl

MR

+ catalogues of

Bielefeld

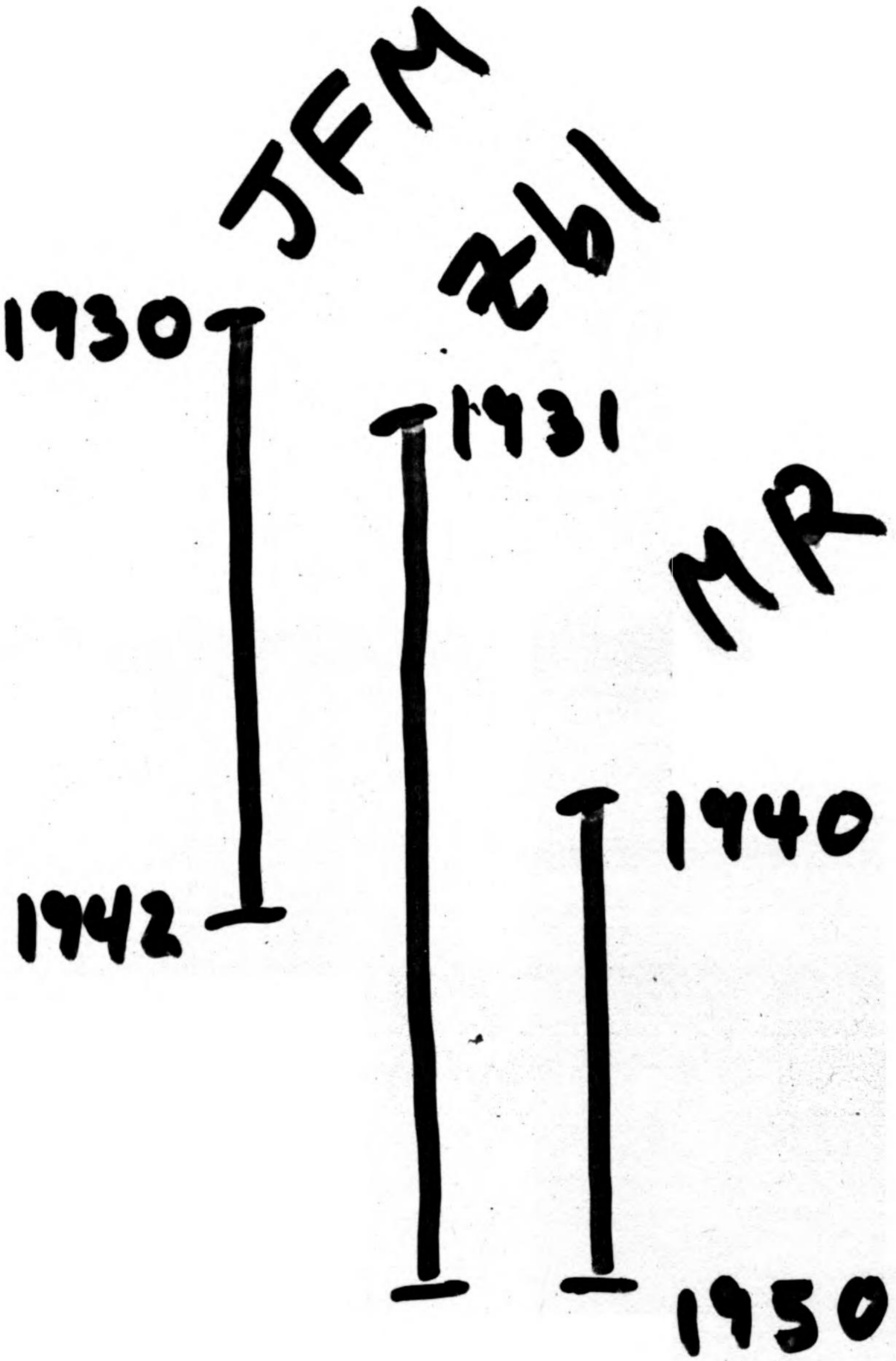
Cornell

Goettingen

Michigan

+ online items

eg. JSTOR, ..



JFM ~ 60,000

Zb1 ~ 78,000

MR ~ 45,000

books, theses ~ 10,000

total ~ 100,000

develop methods + software to

- match data
- correct records
- allow other collections to be added easily

(computer assisted matching)

Why 1930-1950?

- complicated enough to be interesting
- small enough to be doable
- far enough away to avoid politics



# 5 Citation Database in Group Theory

- \* develop software tools
- \* determine most reliable & economical methods
- \* construct working example

Although This would be done in a specific field, the tools & methods should be easily exportable to other fields

- input raw data
  - tools to extract references from current Tex, dot, ps, pdf
  - scan, OCR, parse from "recent" paper
  - for "older" paper, something similar or by hand
- match raw data to
  - canonical entry in database or construct a new entry
  - JFM, EBI, MR review
  - list of online data
- identify (journals, author, ...)
- search
- display, including links

- bibliography of a paper
- papers citing
- reviews in JFM, Zbl, MR
- online version of original

Some tools exist:

- ps2text, prescript

www.ned.org/fastcgi-bin/library

- Cite Seer

www.nec.nj.nec.com/homepages/  
lawrence/citeseer.html

How big is it?

MR, Zbl + experts  $\Rightarrow$

$\sim$  50,000 items

@ 20 refs/item  $\rightarrow$  1,000,000 citations