

# Charles Hermite's Publications in non-French journals

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CIRMATH Summer 2016, Institut Mittag-Leffler, Stockholm

- Between his first publication in 1842 and his death in 1901, Hermite had roughly 200 papers in journals (a few were published in two different places).
- Of these, 115 were published outside France, though all were in the French language. Almost all are research papers, though there are a couple of problem solutions. Some articles are likely to be expository (I have not seen all of them).
- Many of these are communicated in the older epistolary format, though surely in almost every case the result would have been intended for publication, even if it appears as an excerpt from a letter containing other material.

- Thus we have a list of journals, nations or regions with which they are associated, and in some cases individual correspondents.
- In some cases these are the same as the editor of the journal, but in most cases these individuals have a clear personal scientific interest in the subject of the paper (based on their own publications).
- We raise questions about how the journals function in the communities in which they participate.
- In an incipiently international and professional mathematics, we expect some variety and some shifts in the ways they function.
- By thinking about why Hermite places papers where he does, we hope to get some articulated ideas about the ways in which journals work and interact.

## Some numbers: Journals

There are 33 different journals from 11 different countries. 46 of the 117 are in German journals, of which by far the most are in Crelle/Borchardt, 38 in all.

Germany - 46 (in 5 journals)

Italy - 17 (in 5 journals)

Great Britain - 13 (in 6 journals)

Belgium - 9 (in 4 journals)

USA - 7 (in two journals)

Sweden - 5 (in two journals)

Austria (Bohemia/Czechy) - 8 (in 5 journals)

Finland - 4 (in two journals)

Portugal - 4 (in one journal)

Russia - 3 (in 2 journals)

Norway - 1 (in one journal)

## Named Correspondents - To 1880

68 in all, a bit more than half. A number of these correspondents (Borchardt, Fuchs, Mitta-Leffler, etc.) were editors, but in fact the letters addressed to them were on topics within their scientific interests. Also, they were not always letters that appeared in the journals edited by these men. Correspondents named are (chronologically in order of date of first letter):

Jacobi 2 (1846, 1850)

Cayley 3 (1854, 1857, 1873)

Borchardt 14 (1856, 1857(2), 1860, 1861, 1865, 1873, 1874 (2), 1875, 1876, 1878 (2), 1879.

Sylvester 2 (1857, 1877)

Brioschi 5 (1859, 1864, 1868, 1879, 1881)

Gordan 2 (1873, 1876)

Mansion 2 (1874\*, 1876)

Fuchs 5 (1875, 1877, 1884, 1886, 1896)

Königsberger 1 (1876, 1881)

Gyldén 2 (1878, 1880)

Lindemann 1 (1878)

## Later correspondents

Gomes Texeira 1 (1885\*\*)  
Mittag-Leffler 5(1881, 1882 (2), 1883, 1894)  
Schwarz 1 (1881)  
Dini 1(1882)  
Christal 1 (1884)  
Lipschitz 1 (1884)  
Veneziani 1 (1885)  
Craig 2 (1887, 1895)  
Lerch 4(1888 (2), 1890, 1895)  
Caspary 1 (1891)  
Pincherle 3 (1891, 1893, 1901)  
Weyr 4 (1892, 1893, 1894 (2))  
Hensel 1 (1895)  
Sonine 1 (1896)  
Lindelöf 1(1899)  
Jahnke 1(1901)

## Reasons for appearance of a paper in a particular journal

- In the period we discuss, the extent to which it is a choice is variable.
- After 1856, the Comptes rendus was a natural outlet in France (though disputes with the secrétaire perpetuel sometimes restricted this outlet.
- Outside France the venues are frequently linked to a particular correspondent; this determines both the country and the journal (reasons for link can include mentoring).
- In the case where there is no particular correspondent named, there is often a subject link to the work of a particular correspondent or group of correspondents
- There is also a (later) tendency to have a paper appear in early numbers of new journals. These were probably for the most part solicited, sometimes on the basis of personal contact.
- Let's look at a few examples.

## Crelle

- This begins with his earliest work on number theory (Jacobi as correspondent)
- Work on ternary quadratic forms (1850s) builds on or uses techniques by German authors (Gauss, Dirichlet, Eisenstein, Kummer, Göpel). These are expressly cited. Many of these published in Crelle (the only non-Academy journal)
- Cayley and Sylvester also published work on forms in Crelle. It's the location of an international conversation that has broad circulation to those who are active in the field.
- Again after 1856, Borchardt becomes editor († 1880); he has overlapping interests with Hermite ( $\theta$ -functions, etc.) and many papers on diverse subjects are presented to him in letters.
- Later on, work is often addressed to Fuchs, probably more as editor than as collaborator.



# Annali

- Publication in *Annali* begins with a letter to Brioschi in the wake of Hermite's solution of the quintic and related results (first letter in 1859 on reduction of modular equation of degree 8).
- This was a period of interaction with Kronecker and Brioschi on these issues.
- These are much rarer and usually are short observations about a formula involving a special integral or elliptic functions, later on differential equations. Not a venue for major works.
- Dini is also a correspondent (1882).
- Also Pincherle (1893)

## A first reason for choice

- Up to the period of the 1860s, then: Crelle/Borchardt and Annali are the major research journals of record in their respective countries.
- Hermite shares mathematical interests with people involved in the publication of these journals, either directly (as editors) or indirectly (as regular contributors).
- So this appears to be done in order to reach a community of researchers in a specific national/linguistic space, with all that implies about laying claim to an area of research, promoting it, etc.

## Supporting young journals and young mathematicians

- Beginning in the 1870s with his Sorbonne appointment Hermite becomes well-known as a supporter and mentor of a new generation.
- Not only French (Poincaré, Picard, Appell) but foreign: Stieltjes, Mittag-Leffler are well-known cases.
- For Mittag-Leffler, there is a well-known involvement in the organization of translation activities, e.g. of Cantor, for the new *Acta Mathematica*.
- Hermite also contributed to early volumes.
- Let's take a look at a less familiar case.



Figure: Eduard Weyr

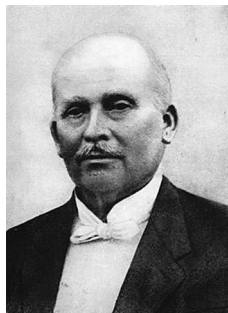


Figure: Matyas Lerch

## Hermite and Bohemia

- Between 1888 and 1895, Hermite published 8 articles in several different Czech journals.
- These clearly arose through contact with Eduard Weyr, then a professor at the Czech Polytechnic in Prague. Weyr had a doctorate from Göttingen (1873) and had studied with Hermite and Serret in Paris.
- Weyr's story resonates with that of Mittag-Leffler. In addition to studies in Germany and Paris Weyr had become an enthusiast of Weierstrass' work around 1880.
- Hermite's first exchange, though, was with Weyr's student Matyas Lerch, who had spent time in Berlin in 1884 studying Weierstrass's methods and knew Kovalevskaya.
- Both Weyr and Lerch published prolifically in several languages.

- Hermite's relationship with Weyr and Lerch recalls the more familiar ones with Mittag-Leffler and Stieltjes, though at less intensity.
- While in this case there is no brand-new journal to be supported, there are existing journals that are in a process of institutional renewal (following a renewed support for some nationalities in Austria after 1867).
- Following a period of pronounced growth, both for the Czech and the German schools in Prague, the Czech academy was refounded in 1890 with Imperial support and became the Franz Joseph academy.
- This had three, sometimes 4 journals that published in French as well as in German and Czech.
- The developing community also brought new energy to the older *Časopis pro pěstování mat. a fys.*

## Some Czech journals publishing mathematics, late 19th c.

- Časopis pro pěstování matematiky a fysiky. – Praha : Jednota českých matematikøu, 1872-1950. Zeitschrift zur Pflege der Mathematik und Physik, redigirt mit besonderer Rücksicht auf Studierende der Mittel- und Hochschulen von F.J. Studnicka, herausgegeben vom Vereine böhmischer Mathematiker in Prag.
- Almanach České akademie císaře Františka Josefa pro vědy, slovesnost a umění. V Praze : Česká akademie císaře Františka Josefa, 1891-1918.
- Rozpravy České akademie císaře Františka Josefa pro vědy, slovesnost a umění. Třída II, (Mathematicko-přírodnická). V Praze : nákladem České akademie císaře Františka Josefa pro vědy, slovesnost a umění, 1891-1916.
- Věstník České akademie císaře Františka Josefa pro vědy, slovesnost a umění Praha : Česká akademie císaře Františka Josefa pro vědy, slovesnost a umění, 1891-1918
- Abhandlungen der königlichen Böhmischen Gesellschaft der Wissenschaften. Prag : Verlag der königl. böhmischen Gesellschaft der Wissenschaften, 1802-1885
- Sitzungsberichte der königl. böhmischen Gesellschaft der Wissenschaften in Prag = Zprávy o zasedání královské České společnosti nauk v Praze. Prag : Königliche böhmische Gesellschaft der Wissenschaften, [1859]-1884.
- Sitzungsberichte der königl. Böhmischen Gesellschaft der Wissenschaften. Mathematisch-naturwissenschaftliche Classe = Zprávy o zasedání královské České společnosti nauk. Třída mathematicko-přírodovědecká. Prag: Königl. böhm. Gesellschaft der Wissenschaften, 1886-1918.
- Mitteilungen der Deutschen Mathematischen Gesellschaft in Prag (1892-)
- Věstník Česke Akademie (Bericht der Kaiserlich-Böhmischen Akademie), continued by Věstník Králevske České Společnosti Nauk. Trida II. Mémoires de la Société Royale des Sciences de Bohème. Classe des Sciences. Praha, Nákladem Královske Ceské společnosti Nauk
- Věstník Královské České společnosti nauk. Třída mathematicko-přírodovědecká = Mémoires de la Société royale des sciences de Bohème. Classe des sciences. – V Praze : Nákladem královské České společnosti nauk : V komisi u Fr. řivnáče, 1919-1953.

## Networks

- The Bohemian texts (both by Hermite and his correspondents) reveal a characteristic feature of these journal choices, the fact that they actively seek to compose international networks of correspondents in Hermite's areas of interest.
- This is part of a strategy of broadcasting the way you see things and the kind of problems and methods you think important.
- It has a discipline-building character (arithmetic algebraic analysis +, see Goldstein and Schappacher).
- Many of the papers in international journals display his own methods for obtaining their results, as well as generalizations and consequences of them.



## What Knowledge is Circulating?

- algebraic analysis [not necessarily arithmetic]
- For example, Craig, Weyr, Gomes Teixeira and Lerch all hear of new derivations of relations involving Legendre polynomials (integral formulas for), and the representation of elliptic functions and integrals.
- These are linked both to his own earlier work (notably as presented in the *Cours d'analyse* of both the école polytechnique and the fac. des sciences) and to the work of colleagues and collaborators (notably Lipschitz, Kronecker).
- There is even a note to an American student (Carlo Veneziani) on series representations (more elementary than the others).
- Promotion then even of a way of teaching, via national research journals.

## Some questions

- Can we improve our list of possible functions of a journal for an author: research propagation, claim-staking, promotion; mentorship; support (and hence influence gained) in international communities; promotion even of teaching styles, ...
- Looking at circulation of knowledge in particular fields, through focus on one or more authors active in an area, could be seen as establishing a network of associated journals.
- I employed the idea of “national journal of record”, but is this a fair qualification? How does it need to be amended?