

Émile Mathieu, Henri Poincaré, Élie Cartan : trois manières de construire une stratégie éditoriale internationale

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Henri Poincaré

- International publications from 1882 (*Mathematische Annalen*, *Acta Mathematica*) on the invitation of the redactors (F. Klein, G. Mittag-Leffler).
- Around 500 papers in mathematical, scientific, philosophical, popular papers, 187 notes in *CRAS*, around 310 papers and among them, around 100 in non-French journals.
- Some papers in many non-French academic journals.
- 23 issues in *Acta Mathematica* between 1882 and 1912, 15 issues in *Rendiconti del Circolo matematica di Palermo* between 1888 and 1912, 4 issues in *American Journal of Mathematics* between 1885 and 1892.
- Poincaré favored very often "international" journals.
- Some personal links with the Redactors (Mittag-Leffler, Guccia and Craig).

Henri Poincaré

- Other international papers in non-French popular journals, teaching journals and philosophical journals
- 5 issues in *L'Enseignement mathématique* between 1899 and 1909, 11 issues in *Popular Science Monthly* in 1907 and 1908 (publication of *The Value of Science*), 7 issues in *Nature* between 1892 and 1899, 12 issues in *The Monist* between 1892 and 1913, 3 issues in *Scientia* in 1911-1912.
- In *The Monist*, some translations by G. Halsted of published papers and an original contribution (in 1892, on geometrical conventionalism).

Henri Poincaré

- Some topics for the German mathematical community in *Acta Mathematica*
- Some international topics : continuous groups (1 in *Transactions of the Cambridge Philosophical Society* et 2 in *Rendiconti*).
- Some French topics : qualitative theory of ODE, celestial mechanics (except the award-winning memoir and two other papers in *Acta*).

Poincaré and *Acta Mathematica*

- Friendship with G. Mittag-Leffler.
- Topics linked with German community : 82/83/84 - 5 papers about Fuchisan functions theory; 83 - paper about meromorphic functions of two variables/Weierstrass; 85 - about a theorem of M. Fuchs; 86-87 irregular integrals (asymptotic series) - Fuchs/Thomé (polemics); 87 - about residues, « en particulier en France et en Allemagne »; 92/96 - 2 papers about polarization by diffraction/comparison with Sommerfeld; 95 - extension of Neumann's method; 98 - About the mathematical work of Weierstrass; 1909 - 1 paper about Richard's paradox/Schoenflies; 1912 - Bolyai Prize/Report about mathematical work of Hilbert.
- 3 survey papers « history of a question to the resolution by Poincaré » : 98-02 - papers about Abelian functions/Riemann/Weierstrass/Appell/Picard/Frobenius/Wirtinger... ; 08 - Uniformization.

Poincaré et les *Rendiconti*

- A warm relationship with G. Guccia
- Between 1888 and 1912, 14/15 papers (670 pages) in the *Rendiconti*. From 1899, the *Rendiconti* are the foreign mathematical journal in which Poincaré published the more. Between 1899 and 1912, 11/12 papers in the *Rendiconti*/6 papers in *Acta*.
- Algebraic integration of differential equations (1891-1897), the equations of the mathematical physics (1894), analysis situs (1899-1904), continuous groups (1901-1908), dynamics of the electron (1906), analytic functions of two variables (1907), reduction of Abelian and Fuchsian integrals (1909), diffraction of Hertzian waves (1910), Report about mathematical work of Hilbert (1911), last theorem of geometry (1912).

Poincaré : conclusions

- Investment in *Acta* - Very few papers in German journals.
- The Hermite publishing model? – some notes in the CRAS and publications divided between French and Foreign journals. Comparison with E. Picard (to do list).
- An internationalization of nation-states and Poincaré is very implicated in the defence of French positions (International congresses, French geodesy, mathematical bibliography...).
- The positions of Poincaré : at the beginning, the rising star of French mathematics, around 1890-1900, the willingness to occupy the most large intellectual area, after, the « universal savant ».
- To do list : the notes in the *CRAS* of foreign mathematicians presented by Poincaré. Foreign members of SMF presented by Poincaré (correspondence with Craig).

Poincaré : Volterra's conclusions

« Poincaré fut un savant moderne dans toute l'acception du mot. Il n'y eut ni Congrès, ni réunion scientifique où sa parole ne se fit entendre. La plupart des journaux scientifiques ont reçu ses mémoires et l'exposition de ses travaux. Les Universités d'Europe et d'Amérique ont entendu ses lectures et ses Conférences. »
[Volterra 1914]

« C'est la vie moderne qui le réclamait, et un homme célèbre tel que Poincaré, populaire parmi les mathématiciens, les physiciens et les philosophes, ne pouvait s'y soustraire. » [*Ibid.*]

- Publications : 1893-1947, International publications : 1893-1947. But, only three papers in non-French journals between 1893 and 1922.
- 152 papers in journals (bibliography of the collected works), 45 notes in *CRAS*, 43 papers in non-French journals. After 1923, 98 papers, 22 notes in *CRAS* and 40 papers in non-French journals.
- No privileged non-French journals - a very dispersed international bibliography (Italy 10 (4 journaux); USSR 6 (4 journals); Swiss 6 (2 journals); Germany 5 (4 journals); Poland 4 (1 journal); Nederland 3 (2 journals); Romania 2 (2 journals); USA, Sweden, Argentina, Spain, Serbia.
- A concentrated French bibliography : except, the *CRAS*, *Bulletin de la SMF*, 16 *Annales of ENS*, 11 *Bulletin des sciences mathématiques*, 9 *Journal de mathématiques pures et appliquées*.

- No real investment in internationalization of publication ; for example, the period 1922-1927 : a very important period for the international standing of É. Cartan (he is 53 years old), theory of connexions linked with theory of general theory (Einstein, Weyl, Eddington..., 10 *CRAS*, 3 *Annales de l'ENS*, 2 *Journal de mathématiques pures et appliquées*, 1 *Bulletin des sciences mathématiques*, 1 *Annales de la Société mathématique de Pologne*, 1 *L'enseignement mathématique*, 1 *Acta Mathematica*, 1 *Proceedings d'Amsterdam*.
- Idiosyncrasy of É. Cartan but also new journals, new territories.

- The importance of USSR (Recueil Soc. Math. Moscou, Bull. Soc. phys.-math. Kazan, Mémoires du séminaire pour l'analyse vectorielle).
- Possibly, the beginning of a very interesting history : French mathematicians in the association -USSR (after WW2) (É. Cartan, J. Hadamard, É. Borel, G. Julia (a surprising red-washing), A. Denjoy, R. Godement, M. Frechet, J. Leray, J. Pérès...

- Correspondants of É. Cartan involved with publishing a journal : Benjamin Kagan (*Mémoires du séminaire pour l'analyse vectorielle*), Stanislas Zaremba (co-founder and 1st president of the Polish mathematical society), Schouten (2 papers in collaboration), Xavier Léon (*Revue de métaphysique et de morale*), W. Blaschke (*Abhandlungen aus dem Mathematischen Seminar der Universität Hamburg*),
- To do list : the notes in the *CRAS* of foreign mathematicians presented by E. Cartan.

Émile Mathieu

- Why Mathieu in this story ?
- Very few publications in non-French journals : 3 papers in Crelle's journal (1862-number theory, 1875-secular inequalities, 1878-potential theory) and a German translation of one of his treatises of mathematical physics (theory of potential).
« J'ai terminé les six premier volumes d'un Traité de physique mathématiques dont deux vont de plus paraître à Berlin, traduits en allemand. »[exposé de ses titres - 1889]
- In the 1862 issue of Crelle's journal, only 2 papers of French mathematicians (Hermite and Mathieu), in the 1875 issue, also 2 French mathematicians (Combesure and Mathieu) and in the 1878 issue, 2 again (Hermite and Mathieu).
- Between 1862 and 1878, only 7 French contributors : Hermite 10, Jordan 4, Mathieu 3, Combesure 2, Painvin 2, Picquet.
- Historisation of the notion of 'international'.

Émile Mathieu

- 1860 - Mémoire sur le nombre de valeurs que peut acquérir une fonction quand on y permute ses variables de toutes les manières possibles - an example (the first) of sporadic simple groups - 1873 - Sur la fonction cinq fois transitive de 24 quantités - a reception in France around 1900 (de Segurier) from Jordan's work - Groupes de Mathieu.
- 1868 - Harmonic functions on a cylinder with an elliptic basis (solutions of a differential equation which is quite common in celestial mechanics (Hill, Poincaré) and mathematical physics - quite active topics in Germany (Heine) and (a bit) in France - small reception of Mathieu's work - 1914-1928 - intense activity around Mathieu's equation and Mathieu's functions in England and USA (Whitaker,...) - reception of Mathieu's work?