Jaëck, Frédéric (ed.); Mazliak, Laurent (ed.); Sallent Del Colombo, Emma (ed.); Tazzioli, Rossana (ed.) [Mittag-Leffler, Gösta; Volterra, Vito]

Gösta Mittag-Leffler and Vito Volterra. 40 years of correspondence. (English)

Heritage of European Mathematics. Berlin: European Mathematical Society (EMS) (ISBN 978-3-03719-199-6/hbk; 978-3-03719-699-1/ebook). viii, 428 p. (2019).

This volume presents in full the extensive correspondence carried out by Gösta Mittag-Leffler (1846–1927) and Vito Volterra (1860–1940) during the final decades of the nineteenth century and the early decades of the twentieth. In total, 359 letters and telegrams are included: the first is dated 4th June 1888, and the last 18th February 1927, just a few months before Mittag-Leffler's death. Between these two endpoints, the letters are quite regularly spaced, with the only notable gap being the relative dearth of letters between 1914 and 1920. Both halves of the correspondence are presented: the letters to Volterra are preserved in the Library of the Accademia Nazionale dei Lincei in Rome, whilst those to Mittag-Leffler are kept in the Archive of the Royal Swedish Academy of Sciences (with copies at the Mittag-Leffler Institute in Djursholm). The volume also includes drafts of letters that were apparently not sent, and, in a small number of instances, transcripts of manuscripts and of letters from Mittag-Leffler's and Volterra's wider circle of correspondents that add context to their exchanges. All letters are presented as transcriptions of the (mostly French) originals, with copious (897) footnotes providing biographical, geographical, and other contextual information, as well as cross-references. This correspondence provides a valuable insight into the mathematical and political milieux, both national and international, within which Mittag-Leffler and Volterra each moved, as well as giving glimpses of the development of the areas of mathematics in which they worked.

The letters appear in the very substantial Part II of the book; Part I consists of roughly 60 pages of preliminary commentary on major themes found in the correspondence and on the interactions between Mittag-Leffler and Volterra more generally. The sections into which Part I is divided are as follows: A. *Presentation of the correspondence.* An outline of the nature of the correspondence and of where it is now held. B. *Mittag-Leffler before Volterra.* Concerning Mittag-Leffler's early career; in particular, his link to Weierstrass. C. *The first meeting between Mittag-Leffler and Volterra.* In the classroom of Ulisse Dini (1845–1918) in Pisa in 1880. D. *Volterra in Dini's footsteps.* On Volterra's early work in analysis. E. *Foundation of the journal* Acta Mathematica. Its foundation by Mittag-Leffler in 1882, and its place in international mathematical publishing. F. *From Dini to Betti, 1882–1887.* Volterra as a follower of Dini during his early career, but then his coming under the influence of Enrico Betti (1823–1892). G. *Functional analysis.* A mathematically detailed account of Volterra's contributions to the early study of functionals. H. *The second meeting. Guccia's role and Volterra's international débuts.* On Giovanni Battista Guccia (1855–1914) and his role in helping Volterra to build an international network that included Mittag-Leffler. I. *1888–1902: Abel's manuscripts.* A survey of the publication of the papers of Niels Henrik Abel (1802–1829), leading up to the celebration of his centennial and Mittag-Leffler's role in this. J. *1891: Sonya Kovalevskaya's error.* The place of Sonya Kovalevskaya (1850–1891) within the correspondence, and Volterra's subsequent discovery of an error in one of her papers. K. *1896: Inversion of integrals.* A detailed survey of a problem that was of interest to Volterra. L. *1898: Mittag-Leffler's star and its prehistory.* On Mittag-Leffler's work on the representation of analytic functions. M. *Mittag-Leffler's engagement for the Nobel Prize in Physics.* Concerning Mittag-Leffler's lobbying for mathematical physicists to be considered for the Nobel Prize in Physics. N. *1906: Volterra's lectures in Stockholm.* On a course on PDEs that Volterra gave in Stockholm. O. *1910:*

Integro-differential equations. Concerning a series of publications and lectures by Volterra. P. *World War I and its consequences, 1914–1920.* On the different political positions of the two men during and after the First World War.

The volume concludes with a 22-page bibliography of items that are cited in Part I and in the footnotes throughout the book, as well as a six-page general index, consisting mostly of names.

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