

Józef Marcinkiewicz: analysis and probability

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The life and work of Józef Marcinkiewicz (1910–40), the centenary of whose birth we celebrate here, is a fascinating story for several reasons.

First, there is the quite extraordinary achievement of a precociously talented young mathematician writing 55 papers in the seven years 1933–40, a number of which have become enduring classics, tragically terminated by his untimely and violent death. This story exemplifies, in one life's work, the larger story of the extraordinary flowering of Polish mathematics between the wars, say from the foundation of *Fundamenta Mathematicae* in 1920 to the destructive impact of the tragic events of 1939–40.

Secondly, there is the impact of Marcinkiewicz on analysis, still ongoing, and exemplified in the famous dedication of Zygmund's *Trigonometric Series*: 'Dedicated to the memories of A. Rajchman and J. Marcinkiewicz, my teacher and my pupil'. This is to be seen in the great achievements of the Calderón–Zygmund–Stein school of analysis so influential today. Here one finds such themes as the interplay between real and complex analysis, and between analysis in one and many dimensions.

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Thirdly, there is the impact of Marcinkiewicz on probability (of particular interest to me as I am myself a probabilist). Here we find such classic results as the Marcinkiewicz–Zygmund inequalities and strong law of large numbers, and the Marcinkiewicz–Zygmund law of the iterated logarithm. The work of the Polish school of probability between the wars – these two authors, Steinhaus, Kac and others – bears comparison with that of the French school, and is outshone only by work of the Russian (then Soviet) school of Kolmogorov, Khinchin and others.

Fourthly, one sees ever more strongly as time passes the constructive interplay between analysis and probability here, exemplified in such topics as maximal inequalities in analysis and martingale theory, type and cotype in the geometry of Banach space, weak-type inequalities in analysis and probability, H^1 and BMO , inequalities of Burkholder–Davis–Gundy type, and wavelets.

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