



Gösta Mittag-Leffler. A Man of Conviction

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Gösta Mittag-Leffler. A Man of Conviction

Arild Stubhaug

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The author of this book, Arild Stubhaug, is well known among mathematicians for his superb biographies of Abel and Lie. Being a *cand. mag.* in mathematics as well as in literature, he was in fact singularly qualified for such undertakings. He managed to convey the flavor of the mathematics involved without discouraging the nonmathematician reader.

It is therefore a matter of great interest that Stubhaug has undertaken the job of writing a biography of Mittag-Leffler. While Mittag-Leffler does not compare to Abel and Lie in mathematical output or creativity, the mathematician G. H. Hardy in 1927 maintained that no one had done more for mathematics during the preceding fifty years. And in fact many consider Mittag-Leffler to be the father of mathematics in Sweden. Most mathematicians know his name from the Mittag-Leffler theorem in complex analysis. It is a counterpart to Weierstrass's theorem about constructing a holomorphic function with prescribed zeros; in Mittag-Leffler's theorem the poles and the singular part at each end pole are prescribed.

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Stubhaug's book traces Gösta Mittag-Leffler's life from childhood on. However, the first chapter starts with a kind of an appetizer, "Journey at the Turn of the Century", which describes a trip Mittag-Leffler took to Egypt with his wife, Signe, accompanied by his personal physician. This is one example of many extensive trips he took during his life for health reasons. In fact, he suffered from serious health problems throughout his life. As a child he suffered from serious pneumonia of a kind where the survival prospects were 0.1 percent. He credited his mother's care for his survival and kept very warm contact with her all her life. He added her name, Mittag, to his father's name, Leffler.

After his professorship in Helsingfors, 1877–1881, Mittag-Leffler accepted a professorship at Stockholm's Högskola. His principal activities can be divided into four parts: (i) reforming Stockholm's Högskola toward a more research-oriented program in mathematics; (ii) founding in 1882 and developing the journal *Acta Mathematica*, which even today is a highly respected mathematical journal; (iii) investing in highly varied enterprises, carbide factories, railroads, waterfalls for hydroelectric production, etc.; and (iv) founding the Mathematical Institute in Djursholm in 1916 jointly with his wife: "The married couple Signe and Mittag-Leffler".

At the time of the founding of the institute their fortune was estimated at four million krona, down from seven million two years earlier. This would decline even further after the First World War. Toward the end of his life he had little left, partly because Signe's inheritance (she died six years before him) had been in large part diverted elsewhere due to another inheritor whom Mittag-Leffler called "The Witch [Hexan] W". After his death the institute was rather dormant except for the continued publication of *Acta Mathematica*.

However, around 1970 Lennart Carleson managed to obtain funding whereby the institute could function in the way Mittag-Leffler had planned, and Carleson served for sixteen years as the scientific director.¹

Activities (ii) and (iii) were connected with very extensive travels all over Europe (and Egypt and Algeria). Many of these trips were taken for reasons of health and necessitated the company of a doctor.

Clearly Mittag-Leffler expected his biography would be written after his death. He always kept a diary, finally totalling ninety-three volumes. He wrote about 20,000 letters to about three thousand correspondents, collected hundreds of articles and drafts thereof, as well as records of business dealings. Every item involved was kept. The "Nachlass" filled about seventy-five shelf-meters. At the Mittag-Leffler Institute one can find series of leather-bound volumes filled with nothing but visiting cards. The list of his *Vitenskapelige Utmerkelser* (honorary degrees and memberships in scientific academies) fills two pages.

After defending his doctoral thesis in Uppsala in 1872 he got a stipend to travel to Berlin and Paris for two to three years. He started in Paris and dutifully attended Hermite's lectures. These turned out to be a real challenge to Mittag-Leffler's familiarity with French, because Hermite had difficulty walking so he did not use a blackboard. He just stood at the lectern and read the lectures from his manuscripts, most of which consisted of formulas for elliptic functions. He lectured 9:00–10:00 p.m. on Christmas Eve and continued Christmas Day at the same time. But Mittag-Leffler was clearly a dashing, charming fellow, and Hermite took a great liking to him, inviting him to dinner *en famille* with his two unmarried daughters present. But he advised Mittag-Leffler to go to Berlin and learn from Weierstrass ("he is the master of us all"). In Berlin Mittag-Leffler had a very productive time and established contact with members of the brilliant Berlin school, particularly Weierstrass. While Weierstrass would have liked to keep him in Berlin, Mittag-Leffler instead applied successfully for a professorship in Helsingfors. From Weierstrass he had heard about his brilliant student, Sonja Kowalevski. Shortly before taking the position at Helsingfors, Mittag-Leffler met her on a trip to St. Petersburg. To his mother he wrote: "Som quinna är hun forjusande. . . Denne dag er en af de mærkeligste i mitt liv. (As a woman she is enchanting. . . This day is one of the most remarkable of my life.)" Through Mittag-Leffler's efforts Sonja was appointed professor at Stockholm's Högskola, and

he did his best to make a pleasant life for her. This was often a difficult task.

Another woman scientist receiving significant support from Mittag-Leffler was Marie Curie. As a member of the Royal Swedish Academy he knew that Pierre Curie was a likely candidate for the Nobel Prize and was aware that her name had not been mentioned. Mittag-Leffler then wrote to Pierre Curie and asked whether she was not a fully worthy partner in his work. Curie answered quite positively that if such a prize was contemplated she would be equally deserving. So they did indeed share the Nobel Prize in physics in 1903. A couple of years later Pierre Curie died in a traffic accident, and in 1911 the chemistry prize was accorded to Marie Curie. At that time the Nobel committee was unaware of the scandal circulating in Paris concerning Marie Curie and Paul Langevin. Arrhenius, another member of the Swedish Academy, then wrote to Marie Curie expressing his opinion that it would be best if she did not come to Stockholm to receive the prize. Mittag-Leffler took quick action and in several telegrams to Langevin insisted that she should come to Stockholm. She followed his advice with deep gratitude. Thus Mittag-Leffler has the honor of arranging the first female professorship in mathematics and the first Nobel Prize to a female.

Stubhaug's description of these scientific political matters makes for fascinating reading. One also gets a clear image of Mittag-Leffler's business and investment affairs, which during some difficult times caused him much grief and criticism. A marital crisis around 1897 caused by jealousies is described with great tact and sensitivity. While reading this book three times I often felt that I was back in Djursholm wandering through the institute or along the paths near the seashore. The book is thoroughly captivating.

While Mittag-Leffler might have thought that his diaries could make an account of his life easy for a biographer, it took almost a century until Stubhaug had the courage to tackle this enormous challenge with reasonable completeness. The result is a fascinating account of Mittag-Leffler's life which at the same time gives a vivid picture of the European mathematical milieu and activities during the period 1887–1920.

¹Information about the Mittag-Leffler Institute and its history may be found in "The dream of a Swedish mathematician: The Mittag-Leffler Institute", by Allyn Jackson, Notices, October 1999.