Mittag-Leffler as I remember him

by

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As one of the few surviving mathematicians who can remember Mittag-Leffler person-ally, I have been requested by the editors of the *Acta* to write down my memories for this volume. In 1927 I spent a month in his company at his beautiful villa in Djursholm. I owe him a debt of gratitude: when I took my leave from him he offered to publish my thesis in the *Acta*. A few months later he was dead; perhaps mine was thus the last paper which he accepted, sight unseen, for publication. His successor Nørlund made good his promise.

First it must be explained how I came to visit him. Soon after World War I, Henri Villat, by his personal charm and his ability to get along with people, had achieved a high position in French mathematics. In 1922 he was made the editor of the renowned *Journal de Liouville* and retained that editorship, or rather managed to cling to it, for a full half-century. In 1925 he was put in charge of the newly created series of mono-graphs, the *Mémorial des Sciences Mathématiques*, somewhat misguidedly set up to rival the German *Enzyklopädie der mathematischen Wissenschaften*, and went on directing it until the *Mémorial's* demise and his own in 1972. It was of course part of Mittag-Leffler's way of life to be on cordial terms with such personalities.

In 1925 Mittag-Leffler, impressed by Hilbert's writings on mathematical logic, and mindful of the lustre he had brought to the *Acta* in earlier days by printing Georg Cantor's most important papers in a French version, wished for Hilbert's latest article *Über das Unendliche* to be similarly translated for publication in the *Acta*. Through Villat I was offered this task; the article, *Sur l'infini*, came out in the winter of 1926 in one of the three volumes dedicated to Mittag-Leffler on his eightieth anniversary.

Later in the same year Villat told me that he had once extracted a promise from Mittag-Leffler for a monograph on polynomial series expansions, to be included in the *Mémorial*. A young Frenchman had been sent to assist in the writing of that mono-graph; with characteristic optimism Villat had somehow formed the impression that a draft had been prepared and that little was needed to bring it to perfection. He knew

that I was due to spend the year 1926–1927 in Germany, chiefly in Göttingen and Berlin, as a fellow of the Rockefeller Foundation or rather of its international branch, then known as the International Education Board. He suggested that I take some time out, go to Sweden and put the finishing touches to the manuscript that was supposed to be lying there.

I knew that German universities are closed in March and April; I was interested in infinite-dimensional vector-spaces, hoped to find there a suitable theme for a doctorate thesis, and imagined that spaces of holomorphic functions might provide valuable examples. I agreed to spend just one month with Mittag-Leffler but no more, stipulating that if this did not suffice I would abandon the project.

Villat approved; so did the Rockefeller Foundation, who agreed to cover the additional travel expenses. It was arranged that Mittag-Leffler would provide for my room and board in his villa for the length of my stay. I left for Germany in the fall of 1926, not without faint misgivings about Villat's plan.

I reached Djursholm in March 1927 and was hospitably received by Mittag-Leffler and his staff. I was given a small but comfortable room on an upper floor; meals were taken *en famille* with Mittag-Leffler's secretaries and assistant, not to mention occasional guests; these included Marcel Riesz, Einar Hille and the economist Gustav Cassel. The old man presided. For my benefit the conversation, at first at any rate, was mostly in French, which he spoke excellently, or else in German, in which he was equally fluent; but soon I acquired a tolerable working knowledge of Swedish. Mittag-Leffler was a perfect host, and he knew it. I found the atmosphere, on the whole, quite pleasant, but a domineering strain in his make-up was unmistakable. When he was back in his study and wished for the presence of his secretary, his call "Fröken där!" was heard all over the house. Perhaps by that time he found it an imposition to have to remember her name; apparently that position had been filled by a succession of personable young ladies, not a few of whom had ended up marrying the assistant or some other mathematician of suitable age.

Mittag-Leffler's photograph, in volume 50 of the *Acta*, gives a good idea of his appearance at the time. He looked like a bird—a bird of prey of course, such as one could see in the Skansen in Stockholm; frail but still tough, wiry, showing little sign (to my inexperienced eye at least) of his impending death, which was to occur in July. On the day after my arrival, I was called to him to discuss the monograph project. That conversation and all subsequent ones on the same subject (perhaps once or twice a week) followed one and the same pattern. He began in French, reminiscing about his earlier work on polynomial expansions, which he remembered in very general terms.

Soon his mind turned to his earlier intimate contacts with great mathematicians, chiefly Weierstrass; at this point he dropped into German. Invariably the next topic was Sonia Kowalewska. Then, understandably, he grew tired and lapsed into Swedish; this was puzzling to me at first, but not so after a week or two; nevertheless, he stopped himself sharply after a while with the remark: "But I was forgetting that you don't know Swedish; we will continue next time."

Other topics emerged, particularly at the dinner table. Once he told about his visit to the pope (I don't remember which one), who had honored him with a private interview. He had found the pope quite broad-minded; his conclusion was "that the pope believed in the Roman Catholic religion no more than he did himself".

As to the manuscript on which Villat founded his hopes, it consisted of a sheaf of papers in disorderly array. What Villat had expected was surely no more than a rehash of Mittag-Leffler's old work; as such this would have been no better and no worse than most of the monographs in his *Mémorial* series, but anyway the hopeless nature of my assignment was immediately obvious, and I ceased taking it seriously. I started writing a few pages, bringing out the connection between polynomial expansions and the theory of topological vector-spaces as I conceived it, confusedly enough, at the time; but I soon gave up. I had come to Sweden with a romantic idea of Stockholm derived from Selma Lagerlöf's *Nils Holgersson*, which had fascinated my childhood; I was in no way disappointed. Early spring is an enchanting season there; the ice was just breaking up; the weather was perfect, the air was wonderfully invigorating. Motor traffic was light; my greatest pleasure was to take long walks around Djursholm or even to walk all the way down to the city. The museums had much to offer; Carl Milles's great sculpture had all the freshness of novelty. The Konserthuset, too, was new; Hötorget Square had not yet become a busy market-place; no eyesores, no jarring sounds threatened to disturb the onlooker's peaceful contemplation.

At night I used to sit in the incomparable library which Mittag-Leffler had spent a lifetime assembling with loving care in his villa. Perhaps its main attraction to me was the room where lay his correspondence, neatly arranged in boxes bearing the names of the great ones of the past half-century; they were all there to keep me company while everyone was asleep, opening up for me the secret recesses of their minds. Here were Hermite's letters of 1881 and 1882 about the trio of brilliant young Frenchmen, Appell, Picard, Poincaré. Vacancies had to be filled; the competition was keen. Picard was Hermite's son-in-law, and his theorem on entire functions had already made him famous; Appell, too, was related to the Hermite family by marriage; Poincaré had barely begun attacking the theory of his "fonctions fuchsiennes". "We have three stars

in our mathematical firmament'', Hermite writes to Mittag-Leffler; but his choice is made: ''I may whisper into your ear'', he adds at once, ''greatly fearing that Madame Hermite could overhear me, that to me Poincaré seems the brightest.''

Here, too, was Painlevé's letter on the death of his wife, after less than one year of a marriage which he had so joyfully announced to his friend Mittag-Leffler in the spring of 1902. At the age of forty he describes himself in touching terms as a broken man, incapable henceforth of turning his mind back to mathematical work; and indeed, as a glance at his list of publications will show, this was the time of his farewell to mathematics.

I have quoted just these two letters, from many more which kept me sitting late in that room in the silence of the villa, a desk-lamp at my elbow, well into the small hours of the morning. Painlevé was almost twenty years younger than Mittag-Leffler, and a free-thinker; Hermite had been more than twenty years older than his correspondent, and a devout catholic. Surely there must have been some rare quality of sympathy in the bonds of friendship which Mittag-Leffler had succeeded in establishing with men so diversely gifted, inducing them to confide their innermost thoughts to him with such abandon. Indeed these friendships, even more than Mittag-Leffler's undoubted practical sense, have been at the root of his great achievement; by this I mean of course the *Acta Mathematica*.

A well-known anecdote has Oscar Wilde saying that he had put his genius into his life; into his writings he had put merely his talent. With at least equal justice it may be said of Mittag-Leffler that the *Acta Mathematica* were the product of his genius, while nothing more than talent went into his mathematical contributions. Genius transcends and defies analysis; but this may be a fitting occasion for examining some of the qualities involved in the creating and in the editing of a great mathematical journal.

Such a journal can be a work of art, no less perhaps than a building; both require the co-operation of many, but there must have been an architect. It can of course neither arise nor subsist in a vacuum. The time is long past when the reputation of the *Memoirs of the St. Petersburg Academy* could rest on the products of Euler's pen alone; nor can the house-organ of any particular group, however brilliant, hope to maintain its level in the long run. A high degree of eclecticism, not often a characteristic of the most creative scientists, is necessary. Good judgment is of course essential; an editor needs advisers, but he must know and control them; to delegate responsibilities wholly to referees is a dereliction of duty. A wide acquaintance, however acquired (in person or by correspondence) within the mathematical world, or at least within important sections of that world; a high degree of sympathy, both intellectual and

personal; above all, a flair for intellectual greatness: these are perhaps the rarest, but also the most indispensable ingredients.

Crelle could sit at home and direct the *Journal für reine und angewandte Mathematik*; when he started it in 1826 the German school of mathematics was fast becoming so strong, and Berlin was such a center of attraction for its members, that Crelle had no difficulty in organizing from there his network of collaborators and correspondents, including such men as Jacobi, Plücker, Steiner, Dirichlet, the Norwegian Abel, and soon some Frenchmen, Hachette, Poncelet, Liouville. In 1836 Liouville followed suit with the *Journal de Mathématiques pures et appliquées*; in this enterprise he could depend upon his Paris colleagues, and among them on some of the most prominent and productive of contemporary mathematicians; to these he could soon add Jacobi, Plücker, Dirichlet. Ties of friendship depended less upon personal contact in those days when travel was slow and expensive, mails were reliable, and letter-writing was both an art and a favorite pastime; the title of corresponding member of an academy was an honor, but by no means an empty one.

In the latter half of the last century things were slowly changing; Mittag-Leffler could never have carried out his ambitious plans for the Acta, had he not previously formed a close acquaintance in person with the French and German mathematicians and been ready to renew it at regular intervals. Also in other respects he rightly felt himself to be eminently well fitted for the task he was undertaking; this emerges clearly from the careful and well-documented article of Yngve Domar in the present volume, which also shows that he was relying confidently upon Hermite and his young friends, foremost of them Poincaré, for the initial success of his plans. As the table of contents of the first few volumes of the *Acta* shows at once, his confidence was not misplaced. Volume 1 opens with Poincaré's *Théorie des groupes fuchsiens*; his *Mémoire sur les fonctions fuchsiennes* appears in the same volume, together with important contributions from Appell, Picard, and Hermite himself, soon followed by many more in the next volumes. At the same time, the names of Malmsten, Gyldén, Zeuthen in volume 1 are a testimony of Mittag-Leffler's success in associating his fellow-Scandinavians to his venture, and those of Reye, Schering, Fuchs, Netto, and many more in the ensuing period, show that he spared no effort in giving it a genuinely international character.

Sometimes the momentum created by a new scientific journal can be so strong as to survive the personality of its founder. It is with legitimate pride, no doubt, that the present editors of the *Acta Mathematica* can now, in gratitude to Mittag-Leffler, celebrate its centenary, look back upon its glorious past and look forward to its future. It is a pleasure and an honor for me to offer them my congratulations on this occasion.