Memories of Vera T. Sós

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April 17, 2023

When I greeted Vera T. Sós on her 90th birthday, I started by saying that I met her in 1962, when the head of the Mathematical Olympic club, István Reiman (my very dear teacher) invited her to give us a lecture.[1]

Speaking of Vera, we have to emphasize two or three things: she was an excellent mathematician and an excellent university teacher. When I became a first-year student, she taught 9 hours of analysis and 2 hours of combinatorics for us. We could only be grateful for what we learned there: we learned incredibly much from Vera. She was the most beloved instructor in our class and for many other classes. (It may seem amusing today, but we voted on our favourite teacher, and Vera definitely won.) It should also be noted that not only did she choose the curriculum well, but dared to choose rather difficult material. It was Vera who often introduced new research fields into Hungarian mathematics. She played a crucial role in what was included in our curriculum in *discrete mathematics*.

Among other things, I must emphasize Vera's human qualities, her unbelievably kind, engaging personality, and, among other things, her empathy. She always cared very much about the youngsters, and in general about everyone around her.

Five lectures were delivered to greet Vera on her 90th birthday at the Rényi Institute. If we wanted to give a realistic picture of Vera's immensely many good qualities, we would have needed much more lecturers and time for this. (This has been done and will be done in other forums.)

Many of us, who have known Vera for many years, were first her disciples, coworkers, and then gradually became friends. We feel that we were very lucky with this. Concisely, but a little more thoroughly,

- I should say that Vera was our legendary teacher, without a doubt one of our most influential teachers. We often still feel her influence in our thinking, mathematics, or when we teach, how we perform. Three people had a decisive impact on me when I became a mathematician, Vera, Erdős, and Turán. All three of them gave me a lot.
- Vera was an internationally renowned mathematician. With her achievements, conjectures and questions, she initiated new research areas in countless fields. Some of her questions and theorems generated whole new theories, with new results from excellent mathematicians appearing to this day.

  She made her PhD with Lipót Fejér, and initially proved important results about the uniformity of the distribution of the $\{n\alpha\}$ sequences. Her related results strongly

[1] I mostly use the names below that are used by our environment, except for Erdős.

influenced discrepancy theory, among others the Vienna school around Hlawka. Besides her effect on number theory, her contribution to combinatorics is outstanding. Besides Erdős, Vera is perhaps one of those who played the most prominent role in the success of Hungarian combinatorics.

- Vera liked mathematics for at least three reasons. She liked it because she had an excellent high school teacher in mathematics, Tibor Gallai. She loved mathematics because of its beauty, and she loved it because in some way mathematics provided her security, especially during the difficult periods of her life.

- Vera's mathematics was also characterized by her ability to ask excellent questions. Not one of these induced a subfield of discrete mathematics. We often argued if an interesting question in a given area is worth extending to a whole other area. Here's what I'd like to mention.

  (a) If I disregard the fact that Erdős's problem-provoking articles often counted as survey articles, I read the first survey from Vera Sós: in her Rome article from 1976 she studied the relationship between finite geometry, graph theory and intersection theorems. She wrote many important survey articles, and taught me how to write survey articles; we even wrote joint survey articles. Of these, I would like to highlight our Ramsey-Turán paper.

  (b) Sidon series are important in *combinatorial number theory*. Laci Babai and Vera Sós extended these to Abelian groups, and since then there have been many results in which various aspects of combinatorial number theory has been extended to Abelian or any other groups. With Ervin Fried, she extended her famous 3-distance theorem to algebraic structures.

- Vera was one of the most influential science promoters. With the combinatorics conferences organized in Hungary, she made a significant step in the direction that Hungarian mathematics is so well-known internationally. When organizing conferences, of course, the most important thing for her was to organize a high-quality conference, but she also paid close attention to important organizational issues and details.

- The recognition of her professional and scientific organizing ability is well reflected by many editorial board memberships of international journals and the high number of regular invitations to international conferences, and many more similar data.

- Vera cared very much about people around her, and with her advice she often had a decisive influence on people around her. Her social sensitivity was outstanding.

But when we're talking about the effect of Vera T. Sós, I'd like to point out a seemingly small thing. When I was a student, I got a lot from listening to Vera's lectures. She was in charge of our student circle, and we had the chance to witness how professionally and generously she carried out this job. (For a long time András Hajnal and Vera Sós supervised the student circle, which was very important for the most talented students.) A lot of us learned that from her. I myself must have learned a lot from her in dealing with outstanding students, and also about teaching students, but it seems to me that Gyuszi Katona, Laci Lovász, Gyuri Elekes or Laci Babai, and many others have learned a lot from her.

She knew what was important both in mathematics and in everyday life. In addition, she has always searched for connections between seemingly distant areas. (One of her important principles was that everything is connected to everything.)

In addition, Vera was interested in many other non-mathematical areas, she liked to hike, travel, listen to music, go to a concert or opera…

She lived in a very harmonious family. Her husband, Pál Turán, was one of the most outstanding figures of Hungarian mathematics, one of Pál Erdős' best friends. Her two sons, György and Tamás, also graduated as mathematicians. Gyuri is professor of mathematics in Chicago, and Tamás is today an outstanding researcher in Hebrew studies in Budapest and in Jerusalem.

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On Vera's 90th birthday, I even pointed out that "I see something off with Vera: according to her ID, she is over 90, but she is actually much younger than that, both in her appearance and in her thinking. Vera could've denied her age at any time for the last 40 years."

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When Erdős died, Vojta Rödl wrote, "Things won't be the same without uncle Paul." The same can be said about Vera. We miss her already.

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Vera T. Sós, one of my dearest friends, is one of the people who influenced me in many ways, mathematically and non-mathematically. When she fell at the age of 92 and went to the hospital, I knew she was in danger. Yet I was shocked when she passed away. I'm shocked over and over again when I'd call her for some reason, and I realize I can't call her anymore.

I'm not alone in this. Vera was very important to very many people in our surrounding, perhaps she was one of the best friends of many of us. Everyone loved, respected and admired her.