

# Erdős Pál, 1913-03-26 to 1996-09-20

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It is an honor and a privilege to be standing here today. The other speakers are associated, with Erdős, with important branches of mathematics, and have made, with Erdős, important contributions to those subjects. They immediately come to mind: Andras Hajnal, when you think of set theory or infinitary combinatorics; Ron Graham, when you think of Ramsey theory; Joel Spencer, when you think of extremal combinatorics or probabilistic methods; Carl Pomerance, when you think of number theory; and Vera Sós, when you think of graph theory.

So I believe that I am here to represent the hundreds, probably thousands, of little guys, and of many far from little guys.

My 45-year colleague Eric Milner, whom I've watched grow under Erdős's influence into an internationally-known mathematician, and who has worked much of that time with Erdős, with Richard Rado & with Andras here.

Aleksandar Ivić, who has written about Erdős far more movingly and far more relevantly than I can, and from whom I've borrowed a number of quotations. For example:

“I most certainly have received more mail from him than from anybody else.”

Many of us can make the same remark.

Béla Bollobás, a long-time protégé of Erdős, whose article most of you have already read in the current issue of *Focus*. Incidentally, the limerick that Béla quotes is due to Leo Moser, who would be standing here today had he not died so young. But he lived long enough to do important work with Erdős.

And the rest of his more than 400 co-authors, including some of the truly great that Erdős was on equal terms with: Richard Rado, Alfred Rényi, Pál Turán.

Since he spent most of his waking hours — which were many — you were likely to be woken at 6:00 a.m. by a phone call or a knock on your hotel room door — most of his waking hours and all of his sleeping hours doing mathematics, you could be forgiven for thinking that Erdős was only a mathematician.

But he was a very caring human being, with a phenomenal memory, not only for things mathematical — he could give you exact references, often including the page numbers, to thousands of papers — but also for the names of your spouse — your “boss” if you were male, or your “slave” if you were female — and of your “epsilons”, your children, and he kept in careful touch with the state of their health.

He listened regularly to what Estelle Milner named “the Sam & Joe show”. “Sam”, of course was Uncle Sam, the U.S.A., and “Joe” was Joseph Stalin, the U.S.S.R. The “Sam & Joe show” was “the nevsh”, an example of applying Hungarian pronunciation to English words, in this case “the news”. “Shelfrid-guh” for John Selfridge, and, an extreme example, if I can do it: “peenayopplay-oopsheeday-dovn-tsokay” for “pineapple upside-down cake”.

He was well-informed on almost any topic of conversation. He probably knew more about the history of your country than you knew yourself. He was constantly making incisive comments on the political situation.

“Why war in Bosnia?” he wrote to Ivić, “Everybody loses.”

As Ivić says, “There is no doubt that Erdős was right. He was a very compassionate man and this showed (among other things) in the understanding of the hardships that the war created in Serbia (refugees, sanctions, negative image of Serbs in Western media, . . .).”

It always seemed that Erdős was eternal; it’s hard to realize that we won’t hear his delightful language again. Music was “noise”, alcohol was “poison”, “the SF” was the supreme fascist, and I’m sure that Joel will tell us something about “The Book”. We will no longer be approached with the question, “Is your brain open?” or, while eating, be asked “Vot vos thees ven it vos alive?”

Erdős contributed an enormous amount to mathematics, but for me his even greater importance is that he created a large number of mathematicians. He was the problem proposer *par excellence*. His ability to formulate problems of any level of difficulty is legendary. Many people can ask questions which are impossibly difficult or trivially easy. It is given to few of us to tread the narrow path between triviality and unattainability. Erdős problems were not Hilbert problems, which took half a century or more to settle. Erdős questions were always just right. So often, when we are fumbling with our research, it is because we are not asking the right question. Many of Erdős’s questions have remained as outstanding, but important problems, but most have been attacked and partially, or perhaps completely, solved.

But Erdős not only asked the right question: he asked them of the right person. He knew better than you yourself knew what you were capable of. How many people must have got started on research by solving a \$5.00, or maybe even a \$1.00 Erdős problem? He gave the confidence that many of us needed to embark on mathematical research.

Ivić writes: “I think that he was doubtlessly the greatest problem proposer of all times. He also had the talent to judge what to propose to whom, and to pick problems suited to the capabilities of the potential solvers.”

The dedication of *Unsolved Problems in Number Theory*, which has a much larger number of Erdős problems than those of any other person, reads:

“Among his several greatnesses are an ability to ask the right question and to ask it of the right person.”

But he didn’t only pose problems; he wrote more than 1500 papers. Those who didn’t know him well thought that he just threw out ideas and got others to write for him. Certainly he had a phenomenal number of co-authors, but a good fraction of his papers were solo efforts, and, far from depending on his co-authors, he often wrote the paper himself and added on the other names, even on occasions when their contributions were comparatively minor.

I quote from Ivić again: “Erdős had the unique talent of being able to say *something* concrete about almost any imaginable problem. Most mathematicians usually cannot say anything about a problem, and in a few instances they can say quite a lot. Erdős was exceptional, in the sense that he had the very rare gift of being able to “attack” almost any problem. Thus he was a living encyclopedia in some sense, and I’ve often heard people say to each other: “If you don’t know, ask Erdős.” His memory also was, even in his last years, fascinating. He knew literally thousands of results, with rather precise bibliographical data. He was literally a mathematician “qui ouvre la voie” (“who opens the path”), as G. Tenenbaum put it in a dedication to Erdős in one of his papers.”

“For Erdős was exactly that: both a friend and a teacher, not only to Pomerance and myself [this is still Ivić speaking], but to generations of number-theorists (and very many mathematicians working in other fields) from over the world. His “teaching” was rather subtle. He never directly gave lessons, taught theorems and methods. It was through *working* with him that one got a grasp of the richness of his methods and ideas. Slowly, perhaps even without noticing, he would take over in your mathematical way of thinking. He would painlessly convince you, by the success of his methods, what and how to use.”

My own greatest debt to Erdős arises from a conversation 30 years ago in the Hotel Parco dei Principi in Rome. He came up and surprised me by saying, ‘Guy, veel you have a coffee’. I don’t drink much coffee, but I was intrigued as to why the great man had singled me out. Coffees were a dollar each, about standard today, but then it seemed a small fortune. When we got our coffee, Paul said,

“Guy, you are eenfeeneetely reech; lend me \$100.”

I was amazed, not so much at the request, but rather at my ability to satisfy it. Once again, Erdős knew me better than I know myself. Ever since then, I’ve realized that I’m infinitely rich: not just in the material sense that I have everything I need, but infinitely rich in spirit in having mathematics and having known Erdős.