A Tribute to Edsger Dijkstra

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Friendship with Edsger and Ria was a wonderful gift that Austin gave us when my wife and I moved here in 1991. Losing them many years later was a great personal loss.

Edsger was interested in "streamlining" mathematical arguments, and his views on the organization of proofs had a profound effect on my professional work. As an undergraduate, I had learned that proof can be best understood as natural deduction – introducing and discharging assumptions. Conversations with Edsger convinced me that, in many cases, it is better to present a proof as a chain of equivalent transformations. As an example, Edsger took the list of theorems that students in my logic class had been given as exercises on the use of Peano axioms, and showed me how to prove them in the Dijkstra/Scholten "calculational style." The proofs were concise and elegant, like every other product of his thought.

This was an eye-opener. Examples of calculational proofs in Edsger's writings were so impressive that I even asked myself whether every possible use of natural deduction in classical logic can be replaced, in principle, by calculational reasoning. The answer turned out to be yes (published in the *Annals of Pure and Applied Logic* in 2002).

Using simple, economical notation is an important rule of mathematical writing that I learned from Edsger. No unnecessary subscripts! One day he showed me a place in a draft that I had asked him to review, where formulas included (I am ashamed to admit) two levels of subscripts, and said: "I showed this page to my students as an example of how NOT to write mathematics. I didn't tell them, of course, who the author is."

I cannot say though that my current views on mathematical reasoning are completely in line with Edsger's. He did not approve of using pictures, and I learned that from our very first conversation about mathematics. Prior to applying for a faculty position at the University of Texas, I came to Austin on an exploratory visit, and Krzysztof Apt invited Edsger and me for dinner. Edsger offered me a tricky puzzle (which is discussed, as I learned much later, in EWD1067). In his eyes, that was probably part of the forthcoming job interview. My solution used a graph that I sketched on a paper napkin. Edsger said that he did not like my geometric approach, but admitted that the answer was correct.

In spite of committing such a grave sin, I was offered the position, which could not have happened without Edsger's endorsement.

Now that Edsger is not with us anymore, I often remember him when I am reading or writing mathematics. I tell myself, "Edsger would have expressed this in a different way ..."