"form follows function" and let ornament in through the back door. There are software systems that, similarly, have been more successful at influencing code than writing it.

If we want to write code then, for business or for pleasure, we need inspiration from beautiful architecture, but we may not be able to work with it. Our work will have to exemplify beautiful architecture, but it has to be practical. The purest and most beautiful of intellectual edifices is the world of pure mathematics; we have a lot to learn from it, but we cannot program in it. We have to make something work, and this is where things start getting messy. Sometimes it is easy to get lost in design methodology, forgetting that our aim is different. Christopher Alexander, the architect father of design patterns had this to say:

> A whole academic field has grown up around the idea of "design methods"—and I have been hailed as one of the leading exponents of these so-called design methods. I am very sorry that this has happened, and want to state, publicly, that I reject the whole idea of design methods as a subject of study, since I think it is absurd to separate the study of designing from the practice of design. In fact, people who study design methods without also practicing design are almost always frustrated designers who have no sap in them, who have lost, or never had, the urge to shape things. (Alexander 1971)

As programmers, we must make things that work, not simply things that look beautiful. These two are not necessarily incompatible. Figure 14-6 shows the Salginatobel Bridge designed by Robert Maillart and completed in 1930. Maillart, a Swiss, studied engineering, but his works, his bridges especially, are exemplars of architectural beauty. Crucially, they are not just beautiful. Maillart built his bridges by winning contracts in competitive tenders, and for Salginatobel Bridge, he won the contract by outbidding 19 other competing designs. Construction of the bridge and the road cost only 700,000 Swiss Francs at that time, less than $4 million today. The bridge is no minnow. It has a span of 90 meters and it vaults 80 meters above the ravine of the Salgina brook (Billington 2000). The slenderness and lightness of the structure is exactly what makes it economical. This bridge is economical thanks to its elegance.

It could be that Maillart's chief virtue was his pragmatism. He arrived at his designs by a form of creative intuition. He eschewed decoration and ornaments, as well as imitation of traditional architectural styles. The structures he designed could not be analyzed with the mathematical tools of the time (and the lack of computers), so they could not be proven to be sound. He evaluated the feasibility of his designs using a simplified graphical analysis. If Maillart had to wait for rigorous validations of his designs, none of them would be constructed (he died in 1940). Maillart "found that innovation, especially in bridge design, came not from laboratory work and mathematical theories, but from design offices and construction sites. Numbers play an essential role in engineering. But innovation in bridge design was the product of visual-geometric imagination, not the outcome of abstract numerical studies or deduction from general theories" (Billington 1997, pp. 1–2).