What can Mathematics Teachers do with History?

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In recent years a strong movement has developed for making more use of history of mathematics in mathematics education. Many mathematics teachers across the world have found history of mathematics a useful resource for their teaching as well as being of personal benefit in their own understanding of mathematics.

There can be a paradoxical contrast between mathematics as experienced by teachers and other practitioners, and how it's seen to the outside world. The outside world, of course, consists of people who went through their schooling and had mathematics lessons some time back: so the impression they're left with has some grounding in their experiences. The paradox is this: on the one hand, mathematics is popularly thought of as dry, frightening, abstract, perhaps boring and certainly timeless, as something which of its nature just is, without any historical dimension of changing through time.　On the other hand, many of its leading practitioners and best teachers throughout history have seen it as having a historical dimension, as having come about by human activity through time. Further, they have seen the historical aspect of mathematics as something which can be used to advantage, both in the teaching of mathematics and in mathematical research.

Perhaps for some people there is a connection between the string of adjectives or attributes of mathematics which I started with? Perhaps the lack of a historical dimension is what contributes to the impression of mathematics as dry, frightening, abstract and so on? This might mean that restoring the understanding of mathematics as something that has changed and developed through time is, for some people at least, a way of changing their perceptions of mathematics and helping them to appreciate it as fun and warm and unthreatening and useful, as a delightful tool, or however you might hope they would see it.

A mathematician's views of the history of mathematics

It is remarkable how seriously mathematicians and mathematics teachers have taken the history of the subject, and what importance they have attached to it.

A good example is found from two hundred years ago, in France in the 1790s. In the heady days after the French Revolution, everything seemed possible. In particular, the educational system was being transformed. It was felt that pupils all over France deserved to have educational opportunities, and indeed have the best education possible. How was that to be achieved? The educational system was restructured with mathematics at its apex. Mathematics education was to be re-formed by training mathematics teachers centrally in Paris and sending them out all over France.　All the leading mathematicians were co-opted in this task. This passage is from the

lectures on elementary mathematics delivered to the trainee teachers by Joseph Louis Lagrange (1736-1813). In the course of these lectures he went in some detail into how logarithms were calculated, from the time of Napier onwards, and then he remarked:

"Since the calculation of logarithms is now a thing of the past, it may be thought that the details into which we have entered are of no value. We may, however, justly be curious to know the trying and tortuous paths which the great inventors have trodden, the different steps which they have taken to attain their goal, and the extent to which we are indebted to these veritable benefactors of the human race. Such knowledge, moreover, is not a matter of idle curiosity. It can afford us guidance in similar inquiries and sheds an increased light on the subjects with which we are concerned."

We can learn quite a lot from this impressive and interesting passage. Lagrange was perhaps the greatest mathematician of the period, one whose experience of pushing back the frontiers of mathematical knowledge extended by this time over more than forty years. It is significant to observe the clear value placed on the history of mathematics by the foremost mathematician of the late eighteenth century.

The rhetoric involved in Lagrange's text is found in several subsequent accounts of history of mathematics and science, particularly those devised for pedagogical purposes: the metaphor of the journey, the trying and tortuous paths, the "great man" model of mathematical workers as benefactors and great inventors, and the metaphor of light at the end.