EDITORIAL

The history of mathematics has long favored the study of the great texts which have put their marks on the development of especially pure mathematics. Only recently have historians begun to give greater importance to various other forms of mathematical creation (linked with technology, art, war, etc.), to the users of mathematical methods, and to the instruments which help to use them efficiently. In a note published in the *Revue d'histoire des mathématiques* for 2000, Dominique Tournès called for the development of "a history of graphical calculus" aimed at graphical methods developed for or by engineers. In this issue, he offers a lengthy study to this end. His call has also been heard more widely. At his initiative, we will publish further articles on related topics. The theme, which may be labelled the "history of the mathematical culture of engineers", will be developed on a long-term basis in the pages of this journal.

In his present paper, D. Tournès describes graphical integration methods developed near the end of the 19th century by a Belgian engineer and professor at the University of Ghent, Junius Massau, whose name is barely known in the history of mathematics. His research concerned the construction by ruler and compass of integral curves, with no analytical considerations. Massau aimed to substitute for the operations of integral calculus – quadrature, integration of differential equations and of partial differential equations – lines on a sheet. The resulting constructions may be exact or approximate, and the error can be calculated graphically, too. These methods have a wide field of application in mechanics (cf. the example of the beam given in the paper) and even in fluid mechanics. In his paper's second part, Tournès attempts to follow the complex circulation of Massau's ideas in Europe. He finds parallel and isolated research streams which either do not communicate at all or which communicate only slightly. He explains this fact in terms of the compartmentalization of different bodies of engineers and of national schools and linguistic spheres, French and German notably. While the *calcul par le trait*, to which Massau's work can be attached, developed in France, German-speaking countries had at their disposal a different kind of graphical method called graphical statics and created by Culmann (1886). It offered satisfactory answers to the problems posed by engineers. This latter part of the paper offers a fascinating description of the lines of convergence and the breaks which characterize the mathematical Europe of 19th-century engineers.

The second paper in this issue relates to quite a different – but equally under-researched – domain of the history of the mathematical sciences: Enlightenment historiography on Indian astronomy. Dhruv Raina focuses on the work of the Parisian astronomer Jean-Sylvain Bailly, its genesis and the debates it provoked. He critically scrutinizes Bailly's hypothesis on the antediluvian origins of Indian astronomy, which Voltaire had already called into question. According to this hypothesis, science originated before the deluge in the context of an ancient people established in North Asia at the 50th parallel. This people was said to have transmitted its knowledge to the Indians and the Chaldeans. This explained the relatively high level of knowledge attained by the Indians in astronomy, even though they had seemingly been unable to progress on their own. For Raina, what we have here is a way to come to grips, in the framework of universal history, with Oriental science. He shows, however, that the sources on which Bailly relied were not ancient primary sources in Sanskrit, but rather 18th-century Jesuit accounts. The comparative approach in the 18th century still rested on pillars of ignorance. Moreover, Bailly's theory was, according to Raina, informed on the one hand by an epistemology of modern 18th-century science to which Oriental science had to conform and, on the other, by a stereotyped representation of the Orient as passive, never changing, and unable to achieve scientific progress. For Raina, this theory is definitely a racial one. It was considered a myth by Bailly's contemporaries and rejected by Laplace and Delambre. This paper provides an exciting example of how cultural values are at work in scientific theory.

The format of the *Revue* (300 pages a year) does not allow for the inclusion of a third paper in this issue. We thought, however, that it would be appropriate to reproduce a text written by Eleanor Robson and published[1] by the Newsletter of the British Society for the History of

[1] *BSHM Newsletter* 49 (Autumn 2003), p. 1–9.

Mathematics (BSHM). There, she assesses the damage caused by the war to Iraq's mathematical and cultural heritage and suggests some simple things we can all do to aid in the recovery of intellectual life in Iraq.

The Editors-in-Chief