

EDITORIAL

The first article published in this number of the *Revue d'histoire des mathématiques* belongs to a particularly dynamic field of research, which happens to be well represented in recent issues of our journal: the study of practical arithmetics from the fifteenth and sixteenth centuries and their role in the introduction of algebra, especially in France. The contributions of Jens Hoyrup, Marie-Hélène Labarthe and Stéphane Lamassé to volume 11 of the *Revue d'histoire des mathématiques* have brought to the fore regional traditions – Italian, Provençal-French, Iberian – the existence of which is changing the image we have had until now of the transmission of algebra.

In this issue, Maryvonne Spiesser shows what the first known treatise of algebra (1484) in France owes to commercial arithmetics. Its author, Nicolas Chuquet, makes use of the experience he acquired through his reading of practical treatises. Algebra or “*rigle des premiers*”, as he names it, is considered one method among others for solving problems. The choice of the method follows a criterion of efficiency. Even if algebra appears to be highly effective, thanks also to the powerful notation introduced by Chuquet, other more traditional rules, like the rule of three for example, may be more efficient in solving a particular problem. The status of the unknown, as it is used by Chuquet, is a hybrid. Quite often the unknown is close to a position as used in rules of single or double false position. Thus, the French tradition in the second half of the century doesn't completely ignore algebra, but draws from the complete array of available methods, among them algebra.

The following three papers are concerned with more recent history. The first two are devoted to Italian mathematicians from the turn of the nineteenth and twentieth centuries. In the first, it is shown how the symbolism and methods of mathematical logic have contributed to the development of functional analysis, and in the second, how the theory of integral equations contributes to the solution of hydrodynamical problems.

Erika Luciano describes on the basis of mostly unknown archival material the tragic destiny of a young student of Giuseppe Peano, Maria

Gramegna, victim of an earthquake at the age of twenty-eight. The core of the paper is an analysis of two memoirs published by the Turin Academy on the solution of systems of differential linear equations, one by Peano published in 1887, the other by Gramegna in 1910. By introducing vectorial and matrix notations, Peano defines the fundamentals of linear algebra. Peano sets up a theory of linear operators developed later in his *Calcolo geometrico*. Gramegna generalises Peano's result to infinite systems and to integro-differential equations. In doing so she strictly adheres to the logical symbolism developed by Peano between 1887 and 1908. This difficult work was poorly received (as was Peano's paper). Gramegna's very abstract paper, in which Luciano recognizes a modern application of the theory of operators and logical symbolism, was a pretext for sharp criticism of Peano's teaching methods in his analysis course at the University of Turin. His colleagues disliked the abstractness of his approach, founded on the logic of the *Formulario*, and eventually relieved him (in 1910) of the position for higher analysis, whereupon he returned to his chair at Turin for infinitesimal analysis. This episode is a good illustration of the decline of Peano's school after 1910.

Pietro Nastasi and Rossana Tazzioli study the little known contributions of Tullio Levi-Civita to hydrodynamics. Their paper relies on an extensive use of Levi-Civita's correspondence (which has just been published by the two authors). His hydrodynamical works can be characterised, in the eyes of the authors, as the search for a rigorous formulation of previous results. Moreover, Levi-Civita introduced the notion of a wake: a solid body moving in a fluid separates the fluid in two regions, the one located in front of the body, the other located at the back (the "wake"); the two are separated from each other by a surface of discontinuity. Levi-Civita then studied a host of hydrodynamical problems with a wake, and solved them with the help of the then-recent theory of integral equations. The fundamental results he obtained were the starting points for his students, like Umberto Cisotti and Tommaso Boggio, who used his analytical approach. This approach was also a source of inspiration for mathematicians outside the school of Levi-Civita, as for instance Henri Villat and Marcel Brillouin in France.

The last contribution to this issue is devoted to the history of the Bourbaki group, and especially the reconstruction of the collective work

achieved inside the group. The question which Ralf Krömer poses is that of the position related to the theory of categories, adopted by the Bourbaki group in the nineteen-fifties. His answer relies, as in the previous article, on correspondence (between Grothendieck and Serre, for instance), but also on archival material which, even if incomplete, is partly new and unexplored. His reconstruction gives an interesting view, far beyond folklore, on the meetings of the group, its discussions and modes of collective writing. Samuel Eilenberg, co-founder of category theory, tried as a member of the group to convince Bourbaki of the utility of adopting the language of categories. Bourbaki seems to have been ready to accept the theory and include it in its great *œuvre* of reorganizing mathematics. However, it was the approach of Alexander Grothendieck to algebraic geometry which led to Bourbaki's explicit rejection of the theory of categories. Besides theoretical and philosophical reasons explained by Krömer, the personal opposition of André Weil seems to have been decisive.

No doubt better accessibility to the Bourbaki archives, only recently made possible, will prove to be a strong stimulus for historical research, which can but enrich what we know about how the group worked together and elaborated its mathematical texts, but also about the mathematical standpoints of the individual members of the Bourbaki group which knew how to cultivate the mystery of its existence and how it accomplished its collective work.

The Editors-in-Chief