Galois 200 years

Ulf Persson

Department of Mathematics, Chalmers University of Technology
SE-412 96 Göteborg, Sweden
ulfp@chalmers.se

The brief life of Évariste Galois ending tragically as a consequence of an ill-advised duel before he was even twenty-one must be known to all mathematicians. Never in the annals of mathematics was there ever a more poignant tale of early brilliance cut short. It is now two hundred years since he was born, and as those lines are being written more than hundred and eighty since he died. His mathematics on the other hand is more alive than ever. To celebrate Galois in a Normat issue in 2011 was a very natural thing to do, and as my co-worker for this issue - Juliusz Brzezinski remarked, especially since the bicenntennial anniversary largely seemed to go unnoticed as opposed to that of Abel ten years ago (but Abel is the pride of a small nation, which takes well care of him).

Articles for this issue have been externally solicited as well as internally produced. Although the initial ambition was for one issue, the amount of material turned out to easily fill out two, with extra material to be published later in due time. Thus, maybe for the first time ever, a double issue is being produced by Normat. As the issue needed to appear in 2011 (at least retroactively) this has held up production of Normat, but I promise that subsequent issues will appear in quick succession. One final remark: Although all the authors are Scandinavian, it so happened that the language of choice for the authors turned out to be English, and hence this introduction is for the sake of uniformity also written in English. This is a deviation from the tradition, and maybe even the mission of Normat, but circumstances are special.

Although he twice was barred from École Polytechnique and had to be satisfied with École Normale from which he was eventually expelled due to the political turbulence of the time, one should not cast him in the role of the misunderstood genius. True Cauchy was more negligent in his duties than even his professorial position would have condoned, but once the work was read its importance was never in doubt. But by then Galois was already dead.

Galois is associated with criteria for solubility of polynomial equations, where he went well beyond his somewhat elder contemporary - Abel, but Galois theory turns out to be concerned with so much more in modern mathematics. Wiles proof of the Fermats Last Theorem would be impossible without it.

In this modest issue on the theme of Galois theory, we have two elementary articles on classical topics for introductory Galois theory, namely on cubics and quartics. We also are happy to be able to include a survey by Christian Jensen, the foremost Scandinavian expert on Galois theory, on the inverse problem. Given a group, can we find an extension of say $\mathbb{Q}$, with that group of symmetries? Juliusz Brzezinski contributes a lengthy survey on connections between Galois theory and number theory and is meant to be an elementary introduction to the Langlands program. Finally Dennis Eriksson voluntered to write on so called Dessins, elementary combinatorial encodings of coverings of $\mathbb{P}^1$ only ramified at three points. This shows how Galois actions also occur in geometric contexts.