Mathematics and Literature

An International Workshop held in Óbidos, Portugal, the 1st October 2016

by José Francisco Rodrigues*

The *Centro Internacional de Matemática*, in partnership with the *Portuguese Mathematical Society* https://www.spm.pt/ and the *Science Museum of the University of Coimbra* http://www.museudaciencia.org/, organized a one day international workshop on *Literature and Mathematics*, with the collaboration and support of the *Centro de Matemática, Aplicações Fundamentais e Investigação Operacional of the University of Lisboa*.

This initiative took place at the beautiful Bookstore SANTIAGO, on the occasion of the FOLIO 2016 — *Óbidos International Literature Festival* http://foliofestival.com/ — organised and hosted by the medieval town of Óbidos http://www.obidos.pt/.

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Figure 1 — A glimpse on the participants at the SANTIAGO bookstore

The workshop, with an average above twenty participants, consisted of ten presentations, covering not only significant aspects of mathematical influence in the literature, interactions between mathematics and poetry, but also on the raise of graphic novel as a mean of communication of Mathematics stories.

Sydney Padua, a cartoonist based in London and author of the recent book *The Thrilling Adventures of Lovelace and Babbage*, spoke on how Ada Lovelace saw in Babage's machine a way to create what she called a "Poetical Science": combining metaphor and mathematics to anticipate the digital age. In her talk she also told the story of these two fasci-

Figure 2 — Sydney Padua explaining her recent book The Thrilling Adventures of Lovelace and Babbage.

Figure 3 — Bernard Hodgson and his mathematico-literary gleanings.

nating and brilliant eccentrics, and discussed her process of primary-source research and creative transformation. Jorge Buescu, from the U. Lisboa, made a presentation on this last decade trend on the comic book-style works as a new literary genre and unexpected interaction between Mathematics and Literature, which are nothing short of spectacular.

Bernard Hodgson, from the U. Laval, Canada, talked on his mathematico-literary gleanings, a series of short papers he is currently writing for *Accromath*, a bi-annual magazine published in Québec and whose mission is the popularisation of mathematics amongst secondary school teachers (and their pupils). With a few examples, mostly taken from the

Figure 4 — António Machiavelo speaking about Proust and Luisa Malato reciting poetry of José Anastácio da Cunha.

Figure 5 — Alexander Nazarov reciting Akhmatova's poem *In Vyborg*

French literature, he showed how ingredients with an explicit mathematical flavour can be found in literary works, and how he sees their potential for the context of secondary education—for example, the extent to which these excerpts could be used as a starting point for a mathematical activity in the classroom. He presented examples from authors such as Marcel Pagnol, Boris Vian, Raymond Queneau (and other OULIPO members), as well as Franquin, the *father* of the famous and hilarious Gaston Lagaffe.

António Machiavelo, from the U.Porto, impressed the participants with the mathematical metaphors that he found in the monumental work of Marcel Proust *In Search of Lost Time*. Going over these deep metaphors, he showed how Proust had very accurate ideas on some non-trivial mathematics and he pointed out some of their philosophical relevance. He explained how he found a sort of loop in the entire book with some delicious self-references with a strong mathematical flavour. Reporting on more or less explicit references to mathematical ideas that abound in Jorge Luis Borges's short stories, like infinity, recursivity, equality, logical paradoxes, Jerôme Germoni, from the U.Lyon 1, aimed to unravel a few reasons why mathematicians often like Borges so much. In his talk, he pointed out not only a few of those structures, but also more hidden resonances where the short story turns out to be unexpectedly similar to mathematical thinking.

The amazing interactions between Mathematics and Poetry were illustrated in three presentations. Darya Apushkinskaya, U. Saarbrucken, and Alexander Nazarov, U. St.Petersburg, told about the friendship between the great Russian poet of the twentieth century Anna Akhmatova and the prominent mathematician Olga Ladyzhenskaya, while Carlota Simões, U. Coimbra, and Carlos Santos, A. Ludus, Lisboa, spoke about Camões and Mathematics. Luís de Camões (1524–1579), the great the Portuguese poet of Renaissance, had a clear and accurate knowledge of XVI century's astronomy. For his epic poem *Os Lusíadas*, it is known

Figure 6 — The participants from left to right: J.F.Rodrigues, P.P.Pálfy, A.Machiavelo, A. Nazarov, C.Toffalori, J.Buescu, B.Hodgson, C.Simões, J.Germoni, S.Padua, C.Santos, D.Apushkinskaya, M.L.Malato

today that the the main source for astronomic references was the mathematician and Royal Cosmographer Pedro Nunes (1502–1578). They also presented several fascinating aspects of Camões' sonnets. José Francisco Rodrigues, U. Lisboa, and Maria Luísa Malato, U. Porto, briefly overviewed the life and work of José Anastácio da Cunha (1744–1787), a Portuguese progressive thinker, modern mathematician and talented poet. As a mathematician, he is known by his deep anticipation on the foundations of infinitesimal analysis, appreciated by Gauss and highlighted by Yushkevich, and as a proto-romantic poet he is considered by Fernando Pessoa to "represent the first white glimmer of dawn on the horizon of Portuguese literature, for he represents the first attempt to dissolve the hardened shape of traditionalist stupidity by the usual method of multiplied culture contacts".

The contribution by Carlo Toffalori, from the U. Camerino, Italy, illustrated the image of Mathematics in Dostoyevsky's novels as clearly negative, by explicitly accusing mathematical determinism of being arrogant and oppressive and by comparing truth and freedom in Mathematics and in the vision of the Russian writer.

Finally, Péter Pál Pálfy, from the Hungarian Academy of Sciences, introduced Péter Esterházy (1950–2016), an outstanding postmodern author, passed away in July this year. Coming from one of the most famous Hungarian aristocratic families he was allowed to study only a subject furthest away from ideology: mathematics. Although he had worked only four years as a mathematician, his creative power and the surprising connections in his writings show that mathematics had a deep influence on his literary works.

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