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MIGUEL DE GUZMÁN OZÁMIZ (CARTAGENA, 1936 - MADRID, 2004)

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Abstract: Short Biography and Contributions to Education of Miguel de Guzmán Ozámiz, ICMI President 1991-1998, Ex Officio Member of the ICMI Executive Committee 1999-2002.

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Math. Subject Classification (2000): 01A70 (01A60, 97A50).

1. Short Biography

Miguel de Guzmán Ozámiz was born on January 12, 1936 in Cartagena (Murcia, Spain) into a family of sailors surrounded by tragic events: his father was executed with 157 other navy officers during the Spanish Civil War, when Miguel de Guzmán was only six months old.

He studied industrial engineering from 1952 to 1954 in Bilbao (Vizcaya) but before completing his studies he entered the Jesuit order and studied humanities and classical arts from 1954 to 1958 in Orduña (Vizcaya); he then went to Germany, where he studied philosophy in Munich until 1961, in the *Berchmanskolleg*.

De Guzmán returned to Spain where he decided to study mathematics in order to achieve the solid knowledge that gives a sure domination over the world and the nature, and also to find a sense of beauty that attracts. As he wrote in a text posted in his website[1] elementary geometry was the "great hobby that attracted me to study mathematics and has remained with

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[1]His internet page, built immediately after his department opened its server, contains numerous texts - mostly in Spanish, a few in English - (retrieved 16 May 2020): http://web.archive.org/web/20030221035442/http://ochoa.mat.ucm.es/~guzman/. Most of the texts available in his former webpage are accessible at the server of the Cátedra Miguel de Guzmán (retrieved 16 May 2020): http://blogs.mat.ucm.es/catedramdeguzman/legado-2/

me throughout my life."(de Guzman 2000, p. 44). De Guzmán completed studies both in mathematics and statistics at the University of Madrid in 1965, and also became interested in the didactics of mathematics because of the humanistic and communicational aspect linked to mathematics. He went to study analysis to Chicago after a visit of Alberto Calderón to Spain in that year and in 1968 he obtained a PhD in mathematics (his doctoral dissertation was on singular integrals with generalized homogeneity) at the University of Chicago under Calderón's supervision. After earning his PhD he became a professor at the Washington University in St. Louis (1968-69). He considered this an immensely productive year because he took contact with many active colleagues in the field of analysis.

In 1969 de Guzmán returned to Spain and became a Professor of Mathematical Analysis at the *Universidad Complutense de Madrid* where he remained from then on, except for a period of two academic years (1982-1984) when he held a position at the *Universidad Autónoma de Madrid*. By this time he had left the Jesuit order because he thought he could do better what he wanted to do outside the order, but he maintained excellent relations with other Jesuits.

In 1971 he married Mayte Garcia-Monge and had two children: Miguel, an architect and Mayte, a physician.

In 1982 he was named a member of the Spanish Royal Academy of Mathematical, Physical and Natural Sciences, an institution where he started an ambitious program aimed at the detection and stimulation of mathematical talent in students from elementary and secondary schools.

According to Spanish mathematicians, de Guzmán was a key figure in Spanish mathematics in the twentieth century. Eugenio Hernández and Fernando Soria wrote in the ICMI Bulletin (n. 54, June 2004, p. 72), that Miguel de Guzmán was

> a central figure in the development of harmonic analysis in Spain and ... captivated the enthusiasm of several generations of mathematicians. He was an extraordinary teacher and communicator and his ideas in mathematical education have had a profound influence on the teaching of mathematics in Spain and in the world. His books, translated into several languages, have made accessible to a large audience that extraordinary activity of the human spirit known as Mathematics.

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To maintain alive the ideas of Miguel de Guzmán, in September 2007 the Faculty of Mathematical Sciences of the *Universidad Complutense de Madrid* created a Chair (Cátedra) named after him. Its activities address issues on Mathematics Education in Spain and internationally, through research projects, seminars and advanced courses.

He died in Madrid on 14 April 2004.

Miguel de Guzmán in Coimbra, Portugal, in 2002

2. Contribution to Education

De Guzmán was president of ICMI from 1991 to 1998. During his mandates he initiated the ICMI Solidarity Fund, a very important solidarity program established by ICMI in 1992 during ICME-7 held in Québec, Canada. The purpose of this program is to help the development of mathematics education in countries in which there is a need of international assistance. The Solidarity Fund is based on private contributions by individuals, associations, etc.

In its first years it has contributed to different projects in Central America and Africa (reports have appeared in the ICMI Bulletin).[2]

The commitment of de Guzmán to education began very early and permeated all his activity. He not only said that "teaching in any form is very attractive"[3] but also that the nature of the mathematical task makes it capable of stimulating important ethical aspects that we should foster in ourselves and that we should try to instill in any healthy educational system of our times. According to de Guzmán one should have a broad vision of what mathematics is and reject the somewhat empty routine that mathematics so many times seems to entail in the classroom. He believed that mathematics is a way to understand the harmony of the universe, a science that seeks the truth, a tool that other sciences use, a creative activity with a beauty that, to use Plato's words, can only be seen with the eyes of the soul. These facets of mathematics are profoundly human and should put mathematics into one of the great axes of our educational system, if teachers are well prepared for that task; he also believed that we are failing in the preparation of mathematics teachers at all levels. In (de Guzman 1989) he presented aspects that should be considered in order to change the situation, such as the exploration of applications, games, etc, and he also discussed the impact of calculators and computers, and of new areas like discrete mathematics, etc. One of the aspects he emphasized the most is the role of history of mathematics. He maintained that history of mathematics is an important aide in:

- giving an idea of how peculiar the surge of mathematical ideas is;
- fixing the period and place of significant ideas and problems, along with their motivation;
- identifying the open problems in each period, their evolution, and how they stand at present;
- pointing out the historical connections of mathematics with other sciences, whose interaction traditionally produced a large number of important ideas.

One of Miguel de Guzmán's main ideas was that mathematics teaching should pay particular attention to problem solving, placing the emphasis on

[2]At present the Solidarity Program has relaunched its activities according to new lines suitable to the changed context and better coordinated with those of the IMU Commission for Developing Countries.

[3]The original text is: "la enseñanza en qualquiera de sus formas es muy actactiva".

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4. Publications Related to Mathematics Education and Popularization of Mathematics

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the processes of thinking, allowing the student to manipulate the mathematical objects, thus activating his mental capacity. He was very critical of textbooks for merely containing exercises and not real problems (unlike the textbooks he co-authored, which were magnificent and, fortunately, had a positive influence on others). De Guzmán claimed that problem solving is an important element in creating a passion for discovery and thought of it as an important element in the attempt to change the attitude of students towards mathematics.

As a mathematician, de Guzmán tried to convince all other mathematicians to become involved in the troubled waters of mathematics education. At ICME-7 he, besides the presidential address, gave a lecture in which he discussed the right way to introduce young people to mathematics research. He tries to answer the following questions: "How should they be introduced to mathematical content and to mathematical theories? What is the attitude we should try to foster in them? What do those who are most successful in preparing young mathematicians actually do?", (de Guzmán 1994, p. 147). In 1996 he gave a talk at ICME-8 on the role of the mathematician in Mathematics Education, in which, admitting that mathematical education is a rather complex task, he claimed that all mathematicians should collaborate together in order to face its many difficult problems with efficiency promoting a global vision of mathematics in human culture (de Guzmán 1998). In this respect, mathematicians should devote their effort to several projects, namely:

- pre and in-service preparation of teachers;
- research in mathematics education;
- mathematics education;
- educational treatment of young talent in mathematics.

His efforts of popularizing mathematics can be seen in several of his books, for example in *Aventuras matematicas* (1986), which was translated into several languages, including French (*Aventures mathématiques*) and English (*The Countingbury Tales: Fun with Mathematics*). This book also tries to convince the reader that mathematics problems should be dealt with following a certain heuristics similar to the one of Polya.

These ideas are well developed in another book *Para pensar mejor* (To Think Better, 1991). In the paper *Juegos matemáticos en la enseñanza* (Mathematical Games in Teaching, 1984) he proposes another heuristics best

suited to the use of mathematical games in teaching. His main ideas can be found in (de Guzman 2007).

TABLE 1. Editions of *Aventuras matematicas*

In order to keep the ideas and the example of de Guzmán alive, the RSME, the Spanish Royal Mathematics Society, in 2005 launched a Summer School of Education aimed at secondary school teachers of mathematics.[4]

In 2014 his family decided to publish de Guzmán's personal journal where his passion for teaching is visible, with phrases like

> Lord, help me to communicate with all generosity what with effort I learn and give me to rejoice with all enthusiasm how much my students achieve beyond what I helped them to learn.[5] (de Guzmán 2016, p. 174)

[4]The first such school was held in 2005 in El Pazo de Mariñán (Bergondo, La Coruña) with the title "Computers and Mathematics Education". It is presently organized by the RSME and one of the societies affiliated to the FESPM, the Spanish Federation of Mathematics Teacher Societies. The 10th was organized in 2018 in the Facultad de Ciencias de la *Universidad de La Laguna*, Tenerife, with the title "Problems solving as an essential part of mathematical activity" https://fespm.es/index.php/2018/02/26/x-escuela-de-educacion-matematica-miguel-de-guzman-2018/

[5]The original text is: 'Señor, ayúdame para comunicar con toda generosidad lo que con esfuerzo aprendo y dame que me alegre con todo entusiasmo de lo mucho que mis alumnos logran más allá de lo que yo les he ayudado a aprender."

Miguel de Guzmán in Coimbra, Portugal, in 2002

3. Essential Bibliography

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