

A Naturally Unique Scholar: Solomon Marcus – a Man Who Was Never Bored*

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The backgrounds of our relationships to Professor Marcus are very different: GP was his student (and has remained his student ever since) while GR has been his admirer ever since they met about 45 years ago. For both of us Professor Marcus, a *UNIQUE SCHOLAR*, is a role model.

To write about Professor Marcus is both easy and very challenging. It is easy because so many enthusiastic attributes can be used to honor and praise him, but at the same time it is challenging, since simply listing all these attributes can trivialize the description. For a detailed overview of his oeuvre we refer the reader to *Întâlniri cu/Meetings with Solomon Marcus*, Spandugino Publishing House, Bucharest, 2011 (over 1800 pages in two volumes), published on the occasion of his 85th birthday.

It seems that the natural curiosity, embedded in children, has never left him. Continuous **learning** and **creativity** are naturally intertwined for him, forming the DNA helix of his intellectual life – actually of his life, as his intellectual and personal lives have melted naturally into his unique existence. He learns and creates as he breathes. He never stops asking questions and analyzing all that happens around him. This sort of life is best summarized by his own statement "I was never bored".

Among his **learning** sources are journals, books, discussions with colleagues, and events of his daily life. He is always prepared to acquire more information: he always carries at least one notebook in his pockets containing his notes in small "print" so as to squeeze a lot of information on a small surface. He learned from, and was shaped by, his interactions with great scientists (mathematicians, such as Miron Nicolescu and Grigore C. Moisil as well as Simion Stoilow and Dan Barbilian, and linguists such as Alexandru Rosetti). He also learns a lot from his disciples – something he often points out.

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His **creativity** is amazing in both the volume of his publications and the range of disciplines covered by his research and writings. He has published over 400 papers and 60 books (authored or co-authored by him), with a number of them translated into many languages. He has made important contributions to analysis, mathematical linguistics, mathematical poetics, semiotics, theoretical computer science, and various applications to natural and social sciences.

His contributions to **mathematics** are remarkable from many points of view. He has published a huge number of papers in many reputable mathematical journals, solved many open problems formulated by other mathematicians, formulated many novel research topics and challenging open problems which were then investigated by many mathematicians, collected an impressive number of citations,...

Professor Marcus is one of the founders of **mathematical linguistics**. His famous and very influential book *Lingvistica matematică. Modele matematice în lingvistică* (in English: *Mathematical Linguistics. Mathematical Models in Linguistics*) published by Ed. Didactică și Pedagogică, Bucharest, in 1963, was repeatedly extended, modified, and updated. The English translation was published by Academic Press, New York, in 1967, and its French translation was published by Dunod, Paris, also in 1967. The book was later translated into Russian, Czech, Italian, and Spanish. Another pioneering book by Professor Marcus, *Gramatici și automate finite* (in English: *Finite Grammars and Automata*) published by Ed. Academiei, Bucharest, in 1964, was one of the first monographs on automata and language theory. Unfortunately it was never translated and so it did not get the international visibility it deserved.

Two important pioneering papers by Professor Marcus were written about the same time. The "lucky" one is the paper which introduced *contextual grammars* (by now often referred to as *Marcus grammars*) which was published in 1969 with its conference version published in 1968. Subsequently more than one hundred papers, two monographs, and about a dozen Ph.D. theses have been written on contextual grammars. Another pioneering paper written in 1974 dealt with the use of linguistic and formal language theory to describe and investigate the biochemistry of DNA. However this paper was "less lucky". It did not receive the attention it deserved, as the scientific community was not yet prepared for such interdisciplinary bridges. The situation is dramatically different now – this paper fits so well into *natural computing*, a major current interdisciplinary research area.

Enormous scientific contributions by Professor Marcus extend beyond mathematics and mathematical linguistics. For example, he is the founder of **mathematical poetics** – his contributions here are very well summarized by Ana Blandiana, a prominent Romanian poet, who wrote: "I am dream-

ing of a world where poets will make as many steps towards mathematics as Solomon Marcus made towards poetics". He made major contributions to **semiotics** – Marcel Danesi, a world authority on semiotics, considers Professor Marcus to be "one of the giants of semiotics". One must also mention here his continuous interest in and significant contributions to the applications of mathematics, linguistics, and formal language theory to very diverse disciplines. They range from the study of structures of folkloric fairy tales to modeling of economic processes (the topic of 1977 Ph.D. thesis by GP supervised by Professor Marcus).

One must also mention Professor Marcus' deep interest and engagement in various aspects of scientific **education**. He wrote many papers and books dealing with education, participated in many TV and radio programs, was involved in mathematical camps for high school students, and payed many visits to schools and universities – his presence at these events was always memorable.

His achievements in any research area that he decided to investigate (and often created) would be considered a successful career of a prominent scientist. But he covers so many areas – it looks as if many top scientists melted into one body of a unique scholar. He can be also called an *engineer of science*, viz., someone who is a master in constructing bridges between so many scientific islands.

It is a testament that this scholar who was never bored created intellectual products that were never boring! This refers to his publications and also his lectures which often provide new insights and novel perspectives, even when he discusses traditional topics. Whenever you meet him, at a conference setting or at a lunch table or at a fruit market or in a tram, he always initiates an interesting discourse, often providing surprising historical details as well as humorous aspects of topics discussed. This, combined with his contagious enthusiasm, friendly nature, and inexhaustible energy, explains why he has so many disciples, co-authors, and admirers.

Although Professor Marcus, through his publications and lectures given all over the world, is a citizen/scientist of the world, he is firmly rooted in **Romanian** science and culture. He is deeply involved in the scientific and organizational life of the Romanian Academy, very visible in Romanian TV and radio programs as well as in many Romanian cultural magazines, and in editorial activities which underscore the achievements of Romanian mathematicians, linguists, and computer scientists. He is certainly a scientific and cultural icon in Romania.

Here are two final arguments for the proof of the natural uniqueness of Professor Marcus

1. his natural modesty and approachability were never influenced by his enormous achievements, and

2. even at the age of 90 he remains as active as always – he is just 90 years young!

These arguments complete our **ode to Professor Marcus** – a naturally unique scholar who was never bored.

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