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Petar Kenderov is 70

Julian Revalski

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Petar S. Kenderov is a distinguished Bulgarian scholar with an outstanding contribution to the development of Mathematics, to the establishment of a system for early identification and development of young talents in Bulgaria in the field of Mathematics and Informatics, to the improvement of school education in Mathematics, and to the development of civil society in Bulgaria.

Kenderov was born on April 5, 1943, in the town of Pazardzhik, Bulgaria. He graduated from secondary school in his hometown and, in 1960, became a student in mathematics at the Faculty of Physics and Mathematics, Sofia University, after passing a special exam aimed at selecting students (among the best performers in the national Mathematics Olympiad). Together with a group of other excellent students

J. Revalski (✉)
Institute of Mathematics and Informatics,
Bulgarian Academy of Sciences, Acad. G. Bonchev str., block 8, 1113 Sofia, Bulgaria
e-mail: revalski@math.bas.bg

who already exhibited an inclination to research, he was sent in 1963 to continue his education in the Mechanics and Mathematics Faculty (the well-known "Mekh-Math") of the Moscow State University. There he was affiliated to the Department of Geometry and Topology, led by one of the founders of General Topology, Pavel Sergeyevich (P.S.) Alexandrov. The educational style of this department was to introduce the students to research as early as possible. Here, Kenderov made his first "course-work" under the supervision of Alexander Vladimirovich Arhangel'skii. After a successful study and defense of a master's thesis (written under the supervision of Vladimir Ivanovich Ponomarev), Kenderov graduated from Moscow State University in 1966 with a recommendation to continue his studies as a PhD student. Part of the results of his master's thesis were published in *Doklady Akademii Nauk SSSR* and in the *Annual Journal of the Moscow State University*. After a brief return to Bulgaria and work at the Institute of Mathematics of the Bulgarian Academy of Sciences, where he passed the necessary postgraduate entry exams in 1967, he went back to the same Mechanics and Mathematics Faculty of Moscow State University, this time as a PhD student. Here, under the supervision of Prof. Dimitry Abramovich Raikov, he defended his PhD thesis entitled "Locally Convex Vector Groups" in 1970. In the summer of 1970, he resumed his work for the Institute of Mathematics at the Bulgarian Academy of Sciences, and, until his retirement in April 2013, his professional life has been associated with this institution. In 1982, he defended his second dissertation and got the degree of Doctor of Sciences in Mathematics. In 1985, he was elected a corresponding member of the Bulgarian Academy of Sciences and, in 1995, became a full member of this organization. At the Institute of Mathematics, he was, for a long time, head of the Department of Operations Research. Under his leadership, the department became one of the most dynamic parts of the institute, opened both to pure research and to applications. P. Kenderov has been actively involved in the management of the institute as well. He served as Deputy Director (1978–1988) and Director (1989–1993).

Petar Kenderov's research started in the field of General Topology and extended to the naturally related areas of Functional and Convex Analysis. Demonstrating a remarkable ability to throw bridges between various areas of Mathematics, he gradually became active in parts of Approximation Theory, Optimization, and Game Theory. We will try to outline a few groups of results, which give an idea of his interdisciplinary approach.

The first group of results is related to the study of set-valued mappings and, more specifically, their continuity and continuity-like properties, sufficient conditions for single-valuedness, existence of densely defined continuous selections, and more. These properties turned out to be of substantial importance when applied to concrete set-valued mappings appearing in different branches of Mathematics. In this way, he was led to numerous applications in Functional Analysis (study of the set of points of single-valuedness and continuity of monotone operators), Convex Analysis (investigation of generic differentiability of convex functions), Approximation Theory (study of the points of single-valuedness and continuity of metric projections), and Optimization (to obtain variational principles).

Another set of results is associated with the development of a new and fruitful approach, based on topological games, to the notion of fragmentability of topological spaces. The latter concept allows showing that some properties of set-valued mappings, such as those listed above, remain valid beyond the class of metrizable

spaces. Among the examples of fragmentable spaces are some important classes of Banach spaces, equipped with the "weak" or the "weak star" topology.

In the most recent years, Kenderov was engaged with the use of topological games in proving some generalizations of the Eberlein Theorem and in giving general conditions under which an algebraic group endowed with topology is actually a topological group.

The contribution of Petar Kenderov to the above fields of research as well as the number of his PhD and master's students have made him one of the founders of the Bulgarian school in the area of Nonlinear and Variational Analysis.

Peter Kenderov's results have received worldwide recognition. Indicators for this are the numerous invited talks at prestigious international conferences as well as his stays, as a visiting professor, at various universities, e.g., University of Canberra and Newcastle (Australia), Bayreuth (Germany), Tor Vergata in Rome, Milan and Genoa (Italy), Murcia (Spain), Waterloo (Canada), Limoges (France), and Auckland (New Zealand). As a fellow of the prestigious Alexander von Humboldt Foundation, he was at the University of Frankfurt in 1978–1979 and later, in 1998–1999, at the University of Bayreuth. He is a member of the editorial boards of several prestigious mathematical journals and Editor-in-chief of *Mathematica Balkanica*, the journal of MASSEE (the Mathematical Society of South-Eastern Europe).

P. Kenderov received the award for young researchers of the Balkan Mathematical Union in 1973, the national award in Mathematics for young researchers in 1977, and the joint N. Obreshkov award of the Bulgarian Academy of Sciences and Sofia University in 1982.

The outline of Kenderov's personality would not be complete if we did not mention his substantial contribution in the field of education. Apart from his rich lecturing career in different universities in Bulgaria and abroad, he has been engaged, since 1976, with the establishment in Bulgaria of a system for early identification and development of young talents in Mathematics and Informatics. As early as 1987, he organized an international competition in Informatics for school students. He was one of the initiators and organizers of the first International Olympiad in Informatics for such students in 1989 and chaired its jury meetings. Recently, P. Kenderov has been one of the main promoters in Bulgaria of a novel approach in mathematics education known under the name "Inquiry-Based Mathematics Education".

Kenderov's work in the field of education was recognized by the international community—he was invited by the programme committee of the World Congress of Mathematicians in Madrid in 2006 to deliver an invited talk in the section Mathematical Education and History of Mathematics. P. Kenderov was elected in 2002 by the General Assembly of the International Mathematical Union (IMU) as a member of the executive committee of the International Commission for Mathematics Instruction (ICMI) for the period of 2003–2007. He has been an active member of the World Federation of National Mathematics Competitions (WFNMC) and served as its Vice President (1996–2000), Senior Vice President (2000–2004), and President (2004–2008).

P. Kenderov is also strongly involved with the work of the St. Cyril and St. Methodius International Foundation, a successor of a nongovernmental organization established in Bulgaria in 1982. The mission of the foundation is to support talent (not only in Mathematics) and to help higher-ability young Bulgarians to get

education in prestigious university centers worldwide. He was Vice President of this organization in the period of 1992–1998 and its President from 1998 to 2013. At the moment, P. Kenderov is President of the governing board of the Union of Bulgarian Mathematicians.

Let us wish Petar Kenderov a very Happy Anniversary!

Let me finally thank warmly to all colleagues, authors and referees, who contributed to the realization of this volume dedicated to Petar Kenderov on the occasion of his 70th birthday. Special thanks are due also to Biagio Ricceri and Boris Mordukhovich for their kind agreement to host this special issue in Set-Valued and Variational Analysis.

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