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In memoriam Steven Vajda, 1901-1995

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IN MEMORIAM
STEVEN VAJDA, 1901-1995 (*)

by J. KRARUP

It is a gift of grace to enjoy a long life without suffering the physical horrors of old age and even more so to preserve both a warm heart and a brilliant mind to the end. Those gifts were granted to Professor Steven Vajda who passed away after a short illness on the 10th December 1995.

His fifteenth book, *A Mathematical Kaleidoscope*, co-authored with Emeritus Professor Brian Conolly, came out just a few weeks before his death. The following biographical notes are based on the section "About our Authors" found therein, on conversations with Professor Conolly, on an interview in *OR Newsletter* (Bather, 1995), and on the citation prepared by Professor Maurice Shutler for the Award of the Companionship of the Operational Research Society to Steven Vajda (Shutler, 1995).

Steven Vajda was born in Budapest in 1901. He studied mathematics primarily in Vienna with shorter visits paid to Berlin and Göttingen, obtaining degrees in actuarial science and mathematics. After qualifying, he worked as an actuary in Hungaria, Romania and Vienna. In 1939, just before the outbreak of World War II, he moved to England. Like many others arriving from continental Europe at that time, Steven Vajda was interned for six months on the Isle of Man where he taught mathematics and participated in establishing a "do-it-yourself" university. During most of World War II he worked for an insurance company at Epsom but in 1944 was invited to join the British Admiralty as a statistician, soon rising to Assistant Director of Physical Research, and later of Operational Research. In 1952 he was promoted Head of Mathematic Group at the Admiralty Research Laboratory.

(*) Published also in OPTIMA, The Newsletter of *The Mathematical Programming Society*.

Pat Rivett was the first Professor of OR in the UK (Lancaster University, 1963). Steven Vajda became the second one when he joined Birmingham University in 1965, a position he held until his retirement in 1968 when he became a Fellow. In 1967 he was invited by Sussex University to become a Fellow, and in 1973 became Visiting Professor of Mathematics, in which role he has continued actively, teaching and writing research papers, for about 22 years, a record which is unsurpassed in the UK and probably anywhere outside the UK as well.

Steven Vajda was awarded an honorary degree (D. Tech. h.c.) by Brunel University. His eminence was also recognized by the Operational Research Society (ORS) in the award of its Silver Medal, followed in 1995 by a Companionship.

The point of embarkation as regards my personal reminiscences must be the year 1954. To those who graduated from a Danish upper secondary school at that time, only three options seemed realistic. The bloodthirsty ones joined the medical school or became dentists, others enrolled at the Technical University, and the remaining few including myself enjoyed two years of compulsory military service before deciding what to do next.

A strong interest in zeros and ones –to the exclusion of almost everything between these two extremes– appeared to be fundamental to my later career. This interest was aroused neither by air defense, nor by subsequent studies of electrical engineering, but dates back to the early years in which I was involved (1958-64) at *Regnecentralen*, The Danish Institute of Computing Machinery, where Danish edp was born. As a graduate student with a limited flair for electrical gadgets and with no professional niche in sight, I found the climate around the first digital computer in Denmark and its users appealing in every conceivable respect. Even an *OR division* materialized. From conceptually simple scenario analyses we moved on via *linear programming* and were soon spellbound by the magic of the computationally “intractable” integers.

The prime influence of Steven Vajda’s textbook *Mathematical Programming* (Vajda, 1961) cannot be overrated in this context. It was instrumental when the above-mentioned OR division was created, and, *sans comparaison*, our key reference during these first years of development. Not only did it introduce the various families of optimisation problems and the algorithmic tools employed for their solution but also the scope and limitations of mathematical programming as a means for investigating

managerial and other decision problems using normative models were accounted for.

These directions were further pursued in my Ph. D. work at The Technical University. I am grateful to my thesis supervisor at that time, not primarily for his supervision as such since our professional interests hardly intersected, but for his emphasis on the significance of building a personal network and his creativity in finding support for conference participation and the like. The most important event of that period was a two-week *NATO Summer School on Contemporary Methods of Discrete Mathematics* (Varenna, Italy, 1966) directed by two leading scholars in the field, Professors F. Harary and B. Roy. An invited speaker was awaited with particular anticipation, a certain Prof. S. Vajda whose visions and thought-provoking viewpoints left a strong impression on all those present.

We met again many years later at the *11th International Conference on Math Programming* (Mátrafüred, Hungary, 1992) where Steven delivered the opening lecture. Under the title "Farkas Alternatives and Applications", the significance of *duality* as a central concept within mathematical programming was highlighted in a very suggestive way. Afterwards, we discussed the first occurrence of duality in general nonlinear programming. I was able to recollect most of Harold Kuhn's findings as presented at the Mathematical Programming Symposium (Budapest, 1976) and, to my great surprise, thus to tell Steven just a little bit about duality which was new to him. This fortunate coincidence gave rise to other meetings and to the exchange of letters resulting in two forthcoming papers (Krarup and Vajda, 1996a, 1996b). Even more valuable, however, was the friendship that evolved between us through these endeavours.

Similar debts to Steven are in one way or another owed by many others. Since Steven joined the Admiralty, he has spent about 50 years consciously or unconsciously motivating the careers of numerous OR workers. He has exerted this influence directly by teaching and conference presentations, and indirectly by his writings and by the example of his life.

A group of friends and colleagues joined forces and suggested to the Mathematical Programming Study Group, ORS, that a special meeting should be organised to celebrate the work of Steven Vajda, the true founding father of mathematical programming in the UK. Focussing on duality, the meeting was eventually held in London on 10 February 1995. Among the highlights were the award of the Companionship of ORS and the warm speeches delivered afterwards at the dinner. Once again, the influence of *Mathematical*

Programming was acknowledged and an even earlier volume (Vajda, 1956) was evoked, the very first book in Europe on linear programming, also translated into French, German, Japanese, and Russian. It is indeed Steven Vajda who can rightly claim to have introduced the subject to both Europe and Asia.

A report on the festive 10 February appeared shortly after (Simons, 1995). Another visible outcome is the forthcoming *Special Edition of Journal of Mathematics in Business and Industry* edited by S. Powell and H. P. Williams (Powell and Williams, 1996).

With a warm heart, a brilliant mind, and an amazing mobility, Steven remained a frequent traveller to conferences and symposia. Insight and an implacable curiosity marked his active contributions as a lecturer or discussant. Likewise, no effort was spared outside the conference halls. Scenic places, historical landmarks: no steps were too high to be climbed. Not even the extremely hot weather in Israel in July 1995 discouraged Steven from taking part in the physically quite demanding 2-days' excursion organised in conjunction with EURO XIV. Not a single detail was missed, let alone the celebrations of EURO's 20th Anniversary. IFORS 96 in Vancouver was supposed to be "next time".

A gift of grace to "shuffle off this mortal coil" in the way it happened. May the same be granted to all of us –when the time comes.

P.S.: Being curious about words, I asked Professor L. B. Kovács, my nativeborn Hungarian colleague at DIKU, whether the name *Vajda* actually means something in Hungarian. It appears that the word can be found in Hungarian texts dating back to about 950 A. D. A *Vajda* is sort of a *regional leader* or a *reigning prince* and close variants of the word are known in ancient Greek, Polish, ancient Russian, Serbo-Croatian, and Slovenian. *Vajdaság* or *the region led by Vajda* is the Hungarian designation of a region in the northern part of Yugoslavia.

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