Professor Dan S. Felsenthal (1938–2019)

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Dan S. Felsenthal passed away in Jerusalem on February 20, 2019 at the age of 80. He obtained his BA and MA degrees at Hebrew University of Jerusalem and his PhD in 1971 at MIT. Early in his career he became interested in mathematical aspects of and approaches to politics, an interest he vigorously pursued over his 50 years in research and teaching positions, primarily at University of Haifa. In 2001 he became a co-director of the Voting Power and Procedures Programme at London School of Economics and Political Science.

Dan's early works focused on group decision efficiency, bargaining, coalition formation and decision theory. His aim was to demonstrate the relevance of the theories

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and mathematical methods to administrative decision making. Through his early work he became one of the pioneers of experimental methods in political science. In 1980's the main focus of his work shifted towards the study of strategic behavior in voting models. His book *Topics in Social Choice: Sophisticated Voting, Efficacy and Proportional Representation* presents a critical evaluation of voting models under various behavioral and institutional assumptions (Felsenthal 1990). In contradistinction to most of his predecessors he expanded the field by applying the concept apparatus to the proportional representation systems. Dan was fascinated by paradoxes encountered in voting and in decision making. This book singled out for closer scrutiny e.g. the chairman paradoxes which occur when the chair, formally vested with more power than ordinary group members, turns out in some situations to be less influential than others.

Perhaps the best-known of Dan's works is the volume *The Measurement of Voting Power: Theory and Practice, Problems and Paradoxes* (Felsenthal and Machover 1998) written jointly with Moshé Machover. It synthesized the results so far reached in the field, provided a comprehensive account of the history of voting power study, discussed its axiomatic foundations in detail and introduced the ternary voting games as well as the important distinction between I-power and P-power. The book soon became essential reading for all scholars working on the analytic foundations of voting institutions. Its timing could not have been more appropriate, given the consecutive enlargements of the European Union accompanied by the debates concerning the voting weight distributions and qualified majority rules in the Council of Ministers. Dan and Moshé assumed an active role in the ensuing scholarly discussion becoming in fact the central actors in it. With time more institutional details were introduced into the voting models whereupon the a priori nature of the power measures became less obvious. Dan followed the developments in the power measurement field until the end of his career. Thus, for instance, his proposal for a new power index was published in 2016 (Felsenthal 2016).

In the closing years of the last century Dan turned again to a subject that he had dwelled upon nearly two decades earlier: the properties of voting rules. He did not see the role of a voting theorist merely in pointing out the plausible or implausible properties of voting rules, but also in taking a stand on which rules should take precedence over the others in practice. Similarly as he and Moshé had strongly defended the Penrose-Banzhaf index of a priori voting power as a tool for evaluating the effects of various institutional arrangements in the EU, they also took a firm stand for Condorcet consistent voting methods in the comparative evaluation of voting rules. They were, of course, well aware of the drawbacks of Condorcet consistent rules, but on balance they found these superior to others.

In 2012 Dan published an extensive article on various voting paradoxes afflicting voting rules (Felsenthal 2012). This subject dominated his last decade of scholarly activity. Dan's particular interest focused on monotonicity paradoxes, i.e. situations where—under a given voting rule—an improved status of a candidate, *ceteris paribus*, deteriorates its position in the collective outcome (e.g. a winner may end up a non-winner). The improvement may occur in a fixed electorate or in a variable one. The latter situations are also known as failures on participation or no-show paradoxes. With Nicolaus Tideman Dan provided a systematization of various types of mono-

tonicity failures (Felsenthal and Tideman 2014). He also analyzed profiles where they may or may not occur. His last booklet (written jointly with Hannu Nurmi)—sent to production less than a week prior to his passing—dealt with a particular type of profile constraint, viz. one where a Condorcet winner exists and is elected by the procedure under investigation (Felsenthal and Nurmi 2019). For Condorcet consistent rules this, of course, coincides with Condorcet domains. The question dealt with was whether the mononicity failures are avoidable in these restricted domains, i.e. whether an intuitively stable outcome (a Condorcet winner) at the outset makes procedures invulnerable to monotonicity failures and other paradoxical outcomes.

Dan's successful and highly influential cooperation with Moshé received a formal scholarly recognition in *Voting Power and Procedures. Essays in Honour of Dan Felsenthal and Moshé Machover*, a collection of 20 articles edited by Rudolf Fara, Dennis Leech and Maurice Salles (2014).

Dan was a brilliant and dedicated scholar: resourceful, hard-working, critical and precise. Over the two last years of his life Dan was connected to an oxygen-supplier, but that did not diminish his intellectual energy at all. He kept on working until the very end. He believed in cumulative knowledge production; works build upon earlier works, sometimes correcting errors, sometimes filling gaps, sometimes strengthening the argument, sometimes expanding or restricting the domain of study. Putting the record straight was the guiding principle for Dan. Many a colleague remembers him as a keen, critical and constructive commentator in conferences and other scholarly gatherings. Behind his occasionally stern and authoritative professionalism was a warm and generous personality. In joint projects, he was often the *primus motor*, initiating the work, keeping it going and securing that the final product was processed in an orderly and timely manner. As a person Dan was above all a family man and a supportive friend: always willing to help and suggest ways of overcoming difficulties. He will be dearly missed.

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