

## **PREFACE**

Over the last fifty years David Gale has played a leading role in developing some of the themes of fundamental importance to economic theory. This volume is a tribute to his creative capacity and is dedicated to his 85<sup>th</sup> birthday. It only reflects a small part of his work in the following important areas of Game theory: the stable matching problem, auction theory, housing markets, combinatorial games and economics of fair division. In all these areas Gale has contributed with papers that have had a lasting impact. His 1962, “College Admissions and the stability of marriage”, co-authored by Lloyd Shapley, for example, has spawned a significant theory, known in the literature as the theory of Matching models, which has been applied in the organization of a variety of markets. His contribution to the foundations of this theory was made through several other papers. Gale and Sotomayor (1985), for example, pre-printed in 1983, provided a survey of the existent theory for the Marriage and College Admissions models, complementing it with new results, providing new and shorter proofs for results already known in the literature, extending them to the general Marriage model and to the College Admissions model without imposing any restriction on the completeness of the list of acceptable partners.

In addition to original work like those mentioned above, it has been notorious the ability of Gale to combine precision and rigour with an elegant style of exposition and to provide simpler alternatives to complicated proofs. An example is the paper of Shapley and Scarf (1974), where he presented a short and simple proof of the non-emptiness of the core of the Housing market, as an alternative to the more complicated proof of the authors. His proof is done by means of the well-known "Top trading cycles algorithm" which has been applied to allocation problems of students to schools and of kidneys to patients. Another example is the suggestion to John Nash to demonstrate the existence of Nash equilibria using the Kakutani Fixed Point Theorem to simplify his proof.

The articles presented here explore different directions in the four areas mentioned above. Some extend the existent literature, while others present new directions.

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