

## Throwback

by

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**Abstract:** With this short composition, I'd like to share with you a few events of my scientific life

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### 1. Introduction

*Control and Cybernetics* (acronym *CC*) was established fifty years ago. Since then, this quarterly journal has silently accompanied my scientific life. My contribution to *CC* consisted of the papers cited in the bibliography and reports on other papers. Furthermore, I persuaded excellent authors to submit for publication their results in the journal. In these pages, I look back upon those days through a thick veil of nostalgia.

More detailed information can be found at [gianfrancogambarelli.it](http://gianfrancogambarelli.it).

### 2. Friends from Poland

First of all, I would like to remember one of my dearest friends, Jerzy Hołubiec\*, whom I will always keep in my heart, no matter how many years have passed since he left us. Jerzy held important positions in prestigious institutions, such as, in particular, the Systems Research Institute of the Polish Academy of Sciences. Jerzy and I exchanged many visits, even during vacations; we did several

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\*Jerzy Hołubiec (1932-2012), professor at the Systems Research Institute, Polish Academy of Sciences, and a couple of other institutions, specializing in voting and social choice theory, energy systems, management etc. Professor Hołubiec was broadly known for his knowledge in and collection of historical lamps, which he left to a museum in Poland. For some period he was the head of the Scientific Station of the Polish Academy of Sciences in Rome (eds.).

investigations together; our work attracted the interest of different journals, including *C&C*.

Other Polish friends who have been my co-authors are Roman Słowiński, Janusz Kacprzyk and Zbigniew Lucki. Zbigniew translated and reinterpreted from Italian to Polish two books of mine (see Gambarelli and Lucki, 2011 and 2015).

From among all of my other Polish friends, I limit myself to mentioning Jacek Mercik, who for many years was the organiser of an important international conference in Wrocław.

### 3. Lloyd S. Shapley

When *C&C* was born, I was a math's student in Milan, and I was taking part of some introductory lessons on Game Theory, taught by Giorgio Szegö<sup>†</sup>. One day, I came forward triumphantly to my professor, telling him that I had devised something on the subject.

The professor, not yet an expert on the matter at that time, was organizing a summer school on mathematical models for economics at Villa Monastero in Varenna, on Lake of Como. Lloyd Shapley<sup>‡</sup> was going to attend and I was invited by the professor to join the school, where I was introduced to Professor Shapley. When I presented my results to the great man, he laughed out loud, explaining how trivial they were. Moreover, as my results were related to a geometry's matter, he thought he was doing me a favor by describing an unsolved problem, concerning a spatial collocation of the "value", renamed Shapley value, as it was introduced by himself in 1953.

As soon as I stepped back into my hotel, I set to work, filling sheets and sheets of paper. After hours of work, I finally found the solution to this problem as well as a quick method of calculation of the Shapley value. I published these results of my research in Gambarelli (1990), along with specific acknowledgment to Shapley for encouraging me to deal with the matter. I also had the opportunity to present my results in Montreal to professor Shapley, who then applauded me with positive comments about my research.

As it is well known, the Shapley value led to a fundamental breakthrough in

<sup>†</sup>Giorgio Szegö (1935-2020), professor at the University of Bergamo, but also at a number of other universities, notably La Sapienza in Rome. Initially specialized in control theory and as such, was close to many of the contributors to and editors of *Control & Cybernetics*, especially in the first decades of the journal's existence. Very active in the domain of applications of mathematics in economics, finance and banking, pioneering many of the related developments (eds.).

<sup>‡</sup>Lloyd Stowell Shapley (1923-2016), mathematician, professor of California University at Los Angeles, one of the leading personalities in game theory, Noble prize laureate in 2012 in economics for his work on game theory (although he considered himself to be a mathematician, and claimed that he had never listened to any lecture in economics). Shapley not only immensely contributed to the theory of games, but also created a number of well-known algorithms (eds.).

the Game Theory. Yet, it is only after almost sixty years, in 2012, that Professor Shapley was awarded the Nobel prize for His achievements. Undoubtedly, the main reason for this delay was Shapley's difficult personality. His personality caused him to argue with the majority of the "VIPs" of his time.

As far as I am concerned, Shapley was towards me always very kind and never failed to share with me a smile. The reason, obviously, lies in the fact that I was not important enough to deserve the honour of quarrelling with him. However, I'd like to think that, when he saw me, his thoughts went back to that hot summer afternoon, when an excited boy explained his findings to him in broken English. I'd like to think he remembered us sitting together at an old stone table under the shade of ancient trees, with the sound of the gently lapping waves of a quiet Italian lake in the background.

#### 4. Guillermo Owen

Guillermo Owen<sup>§</sup> is considered the "Gutenberg" of the Game Theory, as his book "*Game Theory*" was translated into numerous languages, allowing thereby multiple applications of games in various fields. In addition, Owen achieved important scientific results, such as generalizing the Shapley value.

I met him many years ago, in Anacapri, whilst I was helping to organize a summer school, directed by Giorgio Szegö and Harold Kuhn. During a bus trip, we sat next to each other and struck up a conversation. Thereafter, he came to visit me in Bergamo several times and hosted me in Monterey. Together, we published various works on theoretical, applied and historical topics. Owen is, to these days, a very good friend of mine, who often still visits me in Bergamo

#### 5. Harold W. Kuhn

Harold Kuhn<sup>¶</sup> was a Professor Emeritus of Mathematics at Princeton University and a lifelong friend and supporter of John Nash. Professor Kuhn gave the introductory speech to present John Nash during the Nobel Prize ceremony in Stockholm.

He came to see me several times, even without official conferences, only for the pleasure to share time with me and my family. Together, we celebrated his wife Estelle's birthday and he also hosted me in Princeton University.

Once, during one of his trips to my city, Professor Kuhn, who was staying at

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<sup>§</sup>Guillermo Owen (born 1938), mathematician of Colombian extraction, working in the US, known for his research in game theory, a student of Harold W. Kuhn (eds.).

<sup>¶</sup>Harold William Kuhn (1925-2014), American mathematician, having made important contributions to game theory, optimization algorithms and other fields. An associate of John F. Nash (eds.).

the hotel, couldn't sleep because of the loud celebrations of Atalanta<sup>||</sup>'s football fans, the local first division soccer team.

## 6. A beautiful mind

The memory of John F. Nash Jr.\*\* awakes strong feelings within myself because I had the honour, along with Harold Kuhn, to be one of John's two greatest's friends.

I was introduced to Nash in Jerusalem, by my friend Guillermo Owen, during summer, in 1995. We both visited Jerusalem to celebrate Robert Aumann's sixty-fifth birthday (I had met Aumann a few years earlier in Anacapri).

This was Nash's first trip away from Princeton, after the Nobel Prize ceremony. Luckily, John, by then, was gradually recovering and regaining interest for the Game Theory. In just few days, Aumann showed him the progress achieved by that theory of the past forty years.

One afternoon, I was sitting on a bench in a garden, reading my notes, when I saw Nash strolling around. He sat down and I greeted him. He broke the ice with few comments on the beauty of the flowers around us. We chatted a little, talking calmly and with long silences.

After some time, I bade him farewell and left for a meeting. We got on really well, probably thanks to my behavior and attitude towards him: I did not pester him, like the others, but only made a few good-humored quips. Later on that day, we met again at house and we started conversating about the Games Theory. He told me that the progresses on the matter had encouraged him to search for a generalization of his model of negotiation in case of more than two players. He explained to me his idea on the subject. I had to tell him that others had already taken steps towards that direction, with poor results in terms of stability.

After he returned to Princeton, we started to exchange emails.

This was the beginning of our deep friendship, which brought him to visit me in Bergamo many times after. For the readers' curiosity, I will limit myself to quote only one of many anecdotes about him.

In August 2010, my friend Marilda Sotomayor organised the celebration of the sixtieth anniversary of Nash's equilibria in Sao Paulo, with a thousand of participants, including several Nobel prize winners.

The Game Theory Society's staff decided that the plenary sessions should

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<sup>||</sup>Atalanta Bergamo, soccer team, three times third in the Italian Serie A, founded in 1907, and during the last decade having achieved the biggest successes in the last few years, reaching, in particular, the quarter finals of the Champion's League (eds.).

<sup>\*\*</sup>John Forbes Nash (1928-2015), American mathematician having made crucial contributions to several domains, but first of all to game theory. His life and mental illness became popularly known worldwide through the book and movie "A Beautiful Mind". Nash was awarded Nobel prize in 1994 and the Abel prize in 2015 (eds.).

have been presented by pairs of “VIPs”. During the sessions, one of the two VIPs would act as the chairman and the other as the speaker; afterwards, they would swap their roles.

During the parallel session in the morning, I chaired, and Nash, who was in the audience, had seen how well and decisively I handled the timing of the session. For the afternoon plenary session, Sergiu Hart was to chair the session together with Nash.

Before the start, I met Nash and asked him: ”Are you ready?”. He answered uncertainly: “I’m worried because I’ve never been a chairman before in my life”. I tried to reassure him, and then I went away and sat down in the huge auditorium. After stepping on the stage with visible effort, Nash sat next to Hart, looked up and spotted me sitting in front of him. So, he stood up again, came down the steps, approached me and asked me to save him a seat next to me as he hoped for my support throughout the session. Then he went back on the stage and said “Ladies and gentlemen, Sergiu Hart”. Following these words, he came down to sit between me and Federico Valenciano.

Few minutes before the time for presentation would end, I suggested to Nash that it was time to notify Hart. He did not feel like doing it and so the speaker kept talking, unaware that the time was running out. Therefore, I decided to call Hart’s attention, who immediately understood my nod and asked me how much time was left. At my stop signal, he finished his sentence and passed the stage on to Nash.



Robert Aumann, John Nash, Piergiorgio Odifreddi and Gianfranco Gambarelli  
Bergamo, 2008

(photograph: courtesy of Gianfranco Gambarelli)

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