Premier Seminaire Ilya Prigogine: Penser la Science

Facing the Uncertain

Université Libre de Bruxelles, 13th-15th November 1997

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Twenty years ago, back in 1977, Professor Ilya Prigogine, of the University of Brussels, was awarded the Nobel Prize for chemistry for his pioneering work in dissipative structures and self-organizing systems. Last year, from November the 13th until the 15th the Seminaire Ilya Prigogine: Penser la Science, with the title *Facing the Uncertain* , took place in the University of Brussels (ULB). This seminar is the first of a series of interdisciplinary seminars to be held every year in the university, honouring Professor Prigogine and his work.

The opening address of the meeting took place in the Salle Theophile De Donder, a very appropriate hall of the university since it carries the name of Ilya Prigogine's teacher, Prof. De Donder, with whom his early results in systems far from equilibrium were established. Isabelle Stengers, Prigogine's co-author of the book *Order out of Chaos*and organizer of the conference, opened the session. She set the tone for the conference urging the participants to observe a certain kind of self-organization, to welcome a personal discourse, and so create a constructive and lively dialogue.

Next, Ilya Prigogine continued the opening address giving an overview of his long time interests in research in the physics of irreversibility and the emergence of the Arrow of Time. He highlighted three decisive steps in the development of his work. Back in the early sixties, the work on the dynamics of correlations and their flow in time was his focal point. This came to be known as the Theory of Sub-dynamics. The second step was the realization of the irreducibility of the probabilistic approach for systems far from equilibrium to the deterministic picture. This is the so-called 'Misra-Courbage-Prigogine Theory of Irreversibility'. Finally the focal point of his research in the last years became systems archetypal of chaotic dynamics. The main point pursued here is a probabilistic description, in which probability plays a fundamental role in an extended dynamics.

After this opening address came a discussion on the History of Certainty introduced by Helmut Rochenberg (Max-Planck-Institut für Physik, Munich). It covered the developments of the concept of the physical law and determinism. The impact of the 'certainty of determinism': the successes as well as the shortcomings of this heritage, were discussed.

The afternoon session entitled Renewal of Dynamics, was introduced by Tomio Petrosky (University of Texas, Austin) and Ioannis Antoniou (International Solvay Institutes for Physics and Chemistry, Brussels), with contributions by G. Sudarshan and J. Laskar. The topic of suitable extensions of dynamics for unstable, complex systems was discussed. Recent theoretical developments and a wide array of associated concepts were pondered and their interrelations discussed, sometimes in an educational manner and sometimes at a highly technical level. The first day of the conference concluded with a reception hosted at the Royal Academy of Belgium.

The second day of the conference started with a lecture by Gregoire Nicolis (University of Brussels); he discussed 'The Emergence of a World far from Equilibrium'. The contributions following the discussion were by P. Coullet and M. Feigenbaum. Probably since the time of Gibbs, the probabilistic description of systems near equilibrium accounts for the

phenomenon of phase transitions, and in modern statistical mechanics (systems far from equilibrium) the probabilistic description of systems accounts for self-organization.

The evening of the second day was dedicated to the academic ceremony in honour of Prof. Prigogine. The Rector of the University of Brussels, Prof. J-L. Vanherweghem, and the President of the Administrative Council of the University of Brussels, Prof. R. Tollet, talked about Prof. Prigogine[1]s twenty years of continuous service to the University, the scientific community and to the country. The impact of Prigogine[1]s work is definitely world-wide, and he himself has served on a number of the highest science and research committees of various international organizations and first of all as counsellor to the European Commission. An outstanding list of honours bestowed upon him were mentioned. Prigogine is also widely known as a charismatic educator this was also gratefully acknowledged, reflected upon and commented by the speakers. To add a pleasant surprise, the Rector called the Russian Ambassador to Belgium to take the floor in order to offer Prof. Prigogine an academic award on behalf of President Yeltsin himself. It was a highly emotional moment, and the audience applauded enthusiastically. For Ilya Prigogine, born in Moscow in 1917 and whose father emigrated to Belgium when Ilya was still a baby, this carried a special significance which members of the audience felt. The evening ended with a cocktail buffet offered by Mr. and Mrs. J. Solvay at the nearby Salle Dupreel of the University of Brussels.

As Isabelle Stengers mentioned the first day of the conference, the best way to honour a man with a life-long passion for science and research is to talk about the subjects that interest him and not about him. So, back to the auditorium! The third and last day of the conference started with the lecture titled Narrative Elements: A Common Feature Between Natural and Human Sciences, introduced by Mauro Ceruti (Università degli Studi di Bergamo, Italy). The contributions were by J. Wagensberg and A. Di Meo. The seminar ended with a lecture by Immanuel Wallerstein (Binghamton University, New York) titled The Problem of Two Cultures In the Perspective of an Uncertain World, and with contributions by C. Rubino and M. Sandbothe. This has been a long time favourite subject of Prof. Prigogine, to which he has dedicated a plethora of articles and lectures.

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