OPENING REMARKS

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Chemistry, which was defined at its beginning as a science of the analysis of matter is also that of synthesis. Instead of science, perhaps, it may be better to call it the art of analysis, when we think about the extraordinary skill of the pioneers and their wonderful intuition, which very often made up for their ignorance! With the aid of their art, chemists have learnt not only to analyse but also to reproduce a certain number of natural bodies, to recompose them and likewise to rediscover all their properties. It is mainly in the field of organic compounds—these compounds which touch our life so closely—that their successes have so far been the most numerous and the most impressive.

In a well known book, published in 1860, *La Chimie Organique Fondée sur la Synthèse* [*Organic Chemistry Founded on Synthesis*], Berthelot underlined the extraordinary potential of synthetic processes and their fundamental scientific interest: by utilizing them cleverly one could reach at the absolute knowledge of the constitution of compounds formed at the expense of their elements.

At that time, many scientists did still believe in the 'vital force', this mysterious force which determines exclusively the chemical phenomena observed in living beings. Having succeeded in preparing lipids by the reaction of aliphatic acids with glycerin, and in fixing it as his distant and ultimate aim to reproduce carbohydrates and proteins, Berthelot wrote: 'Synthesis presents an immense and new field which is just opening to us and it is for us to go through'.

In going through and cultivating this immense field in a systematic manner, chemists have discovered that synthetic processes lead not only to reproducing existing bodies but also to creating entirely new ones unknown in nature. This double possibility of reproduction and creation rapidly found another immense field, that of industrial applications. Natural and artificial dyes, essential oils and perfumes extracted from plants and animals or fabricated by synthesis, numerous pharmaceutical products, and many other substances unlimited in number were poured into the economic stream and have grown up into dimensions without precedent in all markets. By the end of the last century, organic chemistry had become a source of wealth and constituted a capital factor of the economic flight and democratization of a country. Now, more than ever, the habitat of man, his clothing, his nourishment and his health—in a word, his mode of life—are to a great extent controlled by organic chemistry. The layman is not always aware of this fact, so much so that it may seem trivial to him. We, the chemists, dedicated to the obscure and patient work of the laboratory, know the sum total of intellectual effort, the intensity of thought and concentration of mind indispensable for the discovery of a new synthetic process

as well as of the wonderful machinery necessary for the elaboration of a manufactured chemical product.

In the course of these past years, the progress of organic synthesis has been many-sided and important. New reactions have been discovered, the possibilities of the classic reactions have been improved; in this respect, the choice of a wide range of solvents, the employment of physical procedures of activation, like that of light and pressure, and the utilization of various types of catalysts have often played a decisive role. Simultaneously, the mastery of the problems of stereo- and directio-selectivity has been considerably improved.

Reaction mechanisms, the grasp of which is so necessary for the success of a synthesis, have benefited from a better understanding of the electronic and quantum factors and of a more judicious application than in the past of thermodynamic and chemical kinetics. In this regard it is appropriate to read again the following text written by Hammett in 1940: 'There is no branch of physical chemistry of greater importance to the organic chemist than that of reaction rates. The selection of proper conditions for a synthetic operation is usually a problem in reaction rates and the study of the rates of reaction is the most useful tool for the investigation of reaction mechanism'.

The researches in applied organic chemistry have been equally extensive and the syntheses formerly considered long and difficult have been made easy in the stage of industrial fabrication.

Moreover the techniques of chemical analysis have been completely renewed by the use of chromatography and spectrometry, and also by automation of the apparatus.

In these conditions, organic chemistry has reached new summits in the course of the last two decades. It is to translate this new spring, to make it more sensitive, and to make the international chemical community profit from it that the Division of Organic Chemistry of the IUPAC has decided to launch a series of biennial conferences on organic synthesis. The Organic Chemistry Department of our University has had the honour of being responsible for the organization of the first of these events, and I can assure you that it has done its best to make it a success as perfect as possible. *The programme of subjects for discussion at the conference has been set up by an international scientific committee. This committee had at its disposition the results of a large inquiry conducted by our Department during the first semester of 1973. Nearly a hundred specialists had agreed to answer the questions concerning the themes to be treated and the lecturers to be invited; this procedure allowed us to present a programme on fundamental problems which responds to the present needs of new general methods, stereochemical control, the effect of the medium, physical activation and industrial organic synthesis.* These are the themes for fourteen plenary sessions; each one of these presentations was submitted to discussion by the participants. The abstracts were published in the special issue of the *Bulletin des Sociétés Chimiques Belges (Bulletin of the Belgian Chemical Societies)* and distributed to each and every participant.