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Festivities on the Hönggerberg Zürich The Inauguration of the New ETH Chemistry Buildings

Antonio Togni*

Abstract: The new chemistry buildings of ETH Zürich at the Hönggerberg site were inaugurated on November 1 – 4, 2001. Appropriately for a new research and teaching facility, the festivities included a one-day scientific symposium. Seven speakers, including two high-rank representatives from industry, highlighted some of the most innovative research avenues in the chemical sciences. The importance of fundamental research in chemistry was stressed as a key factor for sustainable growth in a global society.

Keywords: ETH Chemistry · ETH chemistry building · Inaugural symposium · Inauguration

The inauguration of the new chemistry buildings of the Swiss Federal Institute of Technology of Zürich at the Hönggerberg site took place at the beginning of November 2001 and was characterized by three major events.

Official Opening

Thursday, November 1 was devoted to the Official Opening of the new facilities organized by the Executive Board of ETH, many prominent guests being present. The ceremony marked a very important milestone in the history, not only for the Department of Chemistry, but also for ETH as an institution. Speeches were given by ***Olaf Kübler***, president of ETH Zürich, ***Charles Kleiber***, secretary of state for science and research, ***Gottfried Schatz***, president of the Swiss Science Council, ***Wilfred van Gunsteren***, current chairman of the Department of Chemistry, and by ***Nina Lohse***, a Ph.D student. It was noted that 'any new building is an exclamation mark'. As such, and in view of the very significant investment, the new building is a clear and convincing commitment to chemistry.

*Correspondence: Prof. Dr. A. Togni
Department of Chemistry
Swiss Federal Institute of Technology
ETH Hönggerberg
CH–8093 Zürich
Tel.: +41 1 632 22 36
Fax: +41 1 632 10 90
E-Mail: togni@inorg.chem.ethz.ch

Inaugural Symposium

On the second day of the festivities, the Department of Chemistry organized an Inaugural Symposium with the ambitious and attractive title '*Frontiers in Chemistry in a Global Society*'. The symposium was intended to illustrate the most promising and challenging research avenues in modern chemistry and the role of chemistry for society. Attendance was very high and the symposium was a complete success. The first speaker was Novartis' CEO ***Daniel Vasella***. His talk ('*Does a Country's Policy on Higher Education Influence the Success of Its Industry?*') concentrated on a comparison of the different situations of the pharmaceutical industry in Europe (Switzerland) and in the United States. Despite the fact that the pharmaceutical sector – to be recognized as the most globalized of the world economy – is still leading in Switzerland, public expenditure for R&D in our country is stagnating, said Vasella. In contrast, a significant investment growth in recent years, both public and from private companies in the US, characterizes the dynamics involving specifically the pharmaceutical industry in the US. This is also determined by the simple fact that the demand for new and better drugs will grow drastically during the next few decades as the result of the increasing and aging world population. Demand, together with innovation, is one of the key success drivers. Innovation depends on investments, but also on talents. Here too, the competition between Europe and the US has a clear winner, according to Vasella. What can Europe do when facing this situation? 'Deregulate and strengthen education and research', so the bottom line of this highly interesting and critical presentation, though clearly representing the point of view of one of the major global players of the pharmaceutical industry.

Foto: R. Häfliger

D. Vasella

That innovation constitutes a major challenge was also a central theme of the lecture given by ***Stefan Marcinowski***, chairman of the Fonds der Chemischen

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Industrie (‘*Challenges for Academic and Industrial Chemistry in Europe*’). Marcinowski reviewed current visions in disparate interdisciplinary areas. Thus, a topic that still promises new opportunities is biocatalysis. ‘Learning from Nature’, thereby extending the chemist’s toolkit, as potentially applied to the production of vitamins and amino acids by biocatalytic means, is the realization of one of these visions. Furthermore, in the field of nanostructures, materials capable of self-repair, or of responding to stimuli represent a particular challenge. Sustainable development, also in terms of ecoefficiency, will always need key innovations from chemistry. However, so asked Marcinowski, what does it take to innovate? Part of the answer went back to the key message of the previous speaker. While warning that restrictive and discriminating regulatory frameworks can negatively influence the ability of an industry to be competitive, Marcinowski also clearly stated that fundamental research is a key factor fueling new innovative industries.

Foto: R. Häfliger

S. Marcinowski

The first of the topical scientific lectures was delivered by ***Richard Lerner*** of the Scripps Research Institute. As implied by the title (‘*Antibodies Catalyze the Oxidation of Water*’), the research disclosed by Lerner represents a new way of thinking about antibodies. He presented his findings about antibodies that are able to produce H_2O_2 catalytically from oxygen, and whose protein structure is not modified by the presence of H_2O_2. Lerner was followed by ***Richard Ernst*** of ETH Zürich (‘*Fourier Transforms in Spectroscopy: From Monsieur Fourier to Medical Imaging*’). With wit and in the sense of best scientific entertainment, Ernst presented a history of Fourier transform spectroscopy full of anecdotes, including some which concerned himself and the development of FT-NMR spectroscopy. Modern chemistry is unthinkable without Fourier transformation, which has become one of the basic mathematical tools used in our science. So, Ernst concluded, ‘happiness is finding another application of Fourier transform’. In this sense, and becoming almost philosophical, he stated that the most inspiring potential applications of Fourier transform imaging would be in the study of brain functions, understood as an ultimate challenge.

Foto: R. Häfliger

R. Lerner

Foto: R. Häfliger

R. Ernst

Another lecture (‘*Frontiers in Organic and Bioorganic Chemistry*’) was given by ***Ronald Breslow*** of Columbia University. In a first part of his talk Breslow described some of his work combining biomimetic and supramolecular chemistry. Under the heading ‘Liberating chemistry from the tyranny of functional groups’, he presented results concerning Mn porphyrin systems capable of oxidizing functionalized steroids selectively at position 6 (remote oxidation). SAHA (suberoylanilide hydroxamic acid) is a relatively simple organic compound that has been developed in Breslow’s group and that already made it to Phase I clinical trials for the treatment of various types of cancer. The medicinal chemistry around SAHA was the second topic of Breslow’s lecture. By virtue of its histone deacetylase inhibition, SAHA and related compounds are revealing themselves as potent agents inhibiting cancer cell proliferation.

Foto: R. Häfliger

R. Breslow

From bioorganic to solid-state inorganic chemistry: ‘*Rational Design or Combinatorial Approach: Where is the Future in Inorganic Materials Synthesis?*’ was the title of a lecture presented by ***Martin Jansen*** of the Max-Planck-Institut für Festkörperphysik. When facing the frontiers of modern solid-state chemistry, in particular those related to the preparation and study of *e.g.* new superconductors, mesoporous materials, clusters, bioinorganic materials, or catalysts, one does not think necessarily in terms of synthetic chemistry. Solid-state chemistry and synthesis are recognized to be antagonistic in nature. Whereas almost any

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molecule is susceptible of rational design from the point of view of a synthetic approach because of building blocks and functional groups interconversions, solids are not like that. In order to predict a new solid structure, a detailed knowledge of phase-diagrams would be necessary, however, the number of combinations of the different parameters characterizing a phase-diagram is just too large. Jansen impressed with his strategy for predicting solid structures by a global optimization *via* simulated annealing that allows a minimum to be located on the ΔG-hypersurface. The experimental realization of the annealing approach was performed in Jansen's group for *e.g.* the 'direct synthesis' of the metastable form of $AgNO_3$ from the elements.

Foto: R. Häfliger

M. Jansen

Gerhard Ertl of the Fritz-Haber Institute gave a fascinating lecture on surface science as applied to the study of heterogeneous catalysts ('*Heterogeneous Catalysis: Towards Atomic Understanding*'). Detailed investigations of model systems utilizing, amongst a range of experimental techniques, fast STM, allows the characterization of single reaction steps, and, spectacularly, to see atoms moving on a surface. Thus, for the model oxidation reaction of H_2 catalyzed by Pt, it is possible to identify waves of OH groups moving inside the regions covered with O atoms, thus showing the appearance of non-linear phenomena. Ertl's elegant studies provide kinetic data on elementary steps and contribute to making heterogeneous catalysis a less empirical science than it was in the past.

Foto: R. Häfliger

G. Ertl

Open-house Days

The festivities were concluded by two Open-house Days, on Saturday and Sunday, November 3–4. This gave the tax-paying general public the opportunity to visit the new building and its facilities, and thus to understand how and for what purpose an important sum of public money has been invested. A series of lectures by different professors on very disparate topics illustrating the research carried out in the Department were well-attended. It was very encouraging to see how many interested questions came from the public at the end of each lecture. A large number of demonstrations and exhibits in the research laboratories conveyed the fascination of chemistry in all its manifestations, from the simple changing of color of special dyes when exposed to light to the computer-added docking of molecules onto an enzyme, or the explanation of chirality and its meaning for chemistry. For the public it was also possible to carry out experiments in a hands-on manner. This was particularly successful in view of the numerous visitors with children. Crowds had to wait in line before entering the teaching laboratories reserved for this purpose. An estimated 9000 visitors toured the new building during the two days, thus going beyond the most optimistic expectations of the organizing committee. This, too, was an encouraging sign for chemistry.

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