

Conference Report

Appraising Alfred Werner's Groundbreaking Ideas

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Abstract: The Chemical Institutes of the University of Zurich celebrate the 100th anniversary of the Nobel prize award to Alfred Werner in 1913.

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The jubilee celebrations of the Chemical Institutes of the University of Zurich on the occasion of the 100th anniversary of the Nobel prize in Chemistry awarded to **Alfred Werner** peaked in a scientific symposium on Friday, 22nd of November 2013 held at the University of Zurich. To reflect Werner's cosmopolitan personality, the presidents of the chemical societies from Switzerland, France, United Kingdom and Germany praised his scientific achievements. **Peter Kündig**, President of the Swiss Chemical Society, presented a comprehensive account about recent progress in chiral catalysis utilizing modern coordination compounds, and demonstrated how these achievements were ultimately related to Werner's accomplishments. **Jean-Marie Lehn** as the president of the 'virtual' Alsacian Chemical Society (ACS) described beautiful supramolecular assemblies, and emphasized that they originate from the templating power of the metal-ligand coordination. The Vice President of the French Chemical Society, **Gilberte Chambaud**, demonstrated the influence of Werner's ideas on problems in computational chemistry. The three-dimensionality of main group chemistry was beautifully outlined by **Barbara Albert**, President of the German Chemical Society (GDCh,) as applied to the field of boron compounds. Finally, **Leslee Yellowlees** as President of the Royal Society of Chemistry, presented recent results on mechanisms of electron transfer reactions of ruthenium coordination compounds, sophisticatedly elucidated by combined UV/VIS/IR and EPR spectroscopic methods.

In addition to the talks provided by the Presidents of the Chemical Societies, some of the most prestigious chemists such as Sir **Fraser Stoddart** (Northwestern University, USA), **Makoto Fujita** (University of Tokyo), **Ben Feringa** (University of Groningen), **Edwin Constable** (University of Basel), **Jay Labinger** (Californian Institute of Technology, Pasadena) and **Alexander von Zelewski** (University of Fribourg) also made presentations. Following Lehn's concepts, Stoddart framed the directing stereochemical influence of the coordination bond into supramolecular assembly processes. Another highlight in this fascinating meeting was the talk of Makoto Fujita. He showed that macromolecular frameworks consisting of coordination complexes (MOFs) can serve as 'sponges' to be soaked with selected molecules. These molecules arrange themselves in an ordered manner inside the scaffold. Compounds so-far reluctant to crystallization, are thereby incorporated into these giant clusters, resulting in a regular arrangement suitable for diffraction studies. Von Zelewski placed Werner's stereochemical work into a historical context and drew a bow to his own achievements in asymmetric catalysis. Constable explained stereochemical

concepts in coordination chemistry, and showed how they are still nowadays derived from Werner's postulates and experiments. Last, but not least Ben Feringa praised Werner's findings and their impact on his research directed towards metal-catalyzed synthesis of organic molecules and pharmaceuticals. The symposium closed with remarks from Jay Labinger from the History Division of the American Chemical Society. He pointed out the development of 'Inorganic Chemistry' in the United States, which was considered for a long time to be a subdiscipline of organic or physical chemistry. Surprisingly, this view was popular until the 1970s. John Bailar had started this field in the 1930s with no apparent direct link to Alfred Werner. Werner's ideas however were so convincing that they heavily influenced the emerging field of inorganic chemistry, and finally paved the way for organometallic chemistry with its particular focus on the reaction mechanism.



Prof Jean-Marie Lehn with the bust of Alfred Werner created by the artist Abeljanz Jr.



Profs von Zelewski, Lehn, Williams and Alberto (from left to right). On the left you can see the original polarimeter used by Werner.



The group of speakers and chairs of the Alfred Werner symposium. From left to right: Sir James Fraser Stoddart, Alan F. Williams, Makoto Fujita, Roland K. O. Sigel, Alexander von Zelewsky, Edwin Constable, Barbara Albert, Gilberte Chambaud, Ernst Peter Kündig, Jay A. Labinger, Roger Alberto, Ben L. Feringa. Missing are Lesley Yellowlees, Robert D. Eagling. All photos: Department of Chemistry, University of Zurich

It was the connecting power of coordination chemistry that allowed all these excellent researchers to be brought to Zurich on one single occasion – scientists that otherwise would present their work at different conferences. We felt that this mini-symposium provided an excellent opportunity to experience cutting-edge research rooted in Werner's foundations in coordination chemistry from a selection of prestigious scientists on one single day.

This symposium was embedded in a series of other activities. For example, the legal estate of Alfred Werner, kept in the central library in Zurich, could be visited thus allowing a 'personal touch' of the originals of Werner diploma, doctoral and habilitation theses. It also comprises the original manuscript of his dinner speech given at the Nobel ceremony that was handwritten on stationary of the 'Grand Hotel' in Stockholm just before its presentation.

Another important aspect of the activities was to encourage pupils to study chemistry by showing them Werner's achievements and his fascinating personality. Part of the activities was a practical laboratory course, where interested pupils performed some of Werner's groundbreaking experiments. To satisfy the overwhelming interest in this practical laboratory course, the Department of Chemistry has decided to repeat it in 2014. Moreover, an exhibition covered his life and his major scientific

achievements. Anna Bott and Noah Geistlich, two students from the Liceo Artistico, (one of Zurich's grammar schools), put this exposition as part of their Matura work. The exhibition housed the original Nobel prize medal, original complexes resolved into enantiomers by Victor King, the original polarimeter used in these experiments as well as other instruments from Werner's laboratory. It is intended to display these objects in a travelling exhibition at several interested schools throughout Switzerland. The exhibition was inaugurated by the state secretary of education of the Kanton of Zurich, Dr. Regine Aeppli, and by the president-elect of the University of Zurich, Prof. Michael Hengartner. In her speech, Regine Aeppli expressed her gratitude about the exhibition. She described the project as an example of a successful collaboration between university and grammar schools. Michael Hengartner cited from a speech delivered by Werner on the occasion of the Nobel prize celebrations of the Kanton of Zurich. Therein, Werner praised the importance of a good research environment, and acknowledged the citizens of Zurich for their important (financial) contributions to their university and especially to chemistry. He concluded his speech with the sentence "Das Zürchervolk und seine Behörden, sie leben hoch!"

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