Bürgenstock Conference

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50 Years in the Sun of Bürgenstock—On the Success Factors of a Famous Conference

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Bürgenstock Conference · success factors · stereochemistry

50 years ago the Conference on Stereochemistry was started on the Bürgenstock. It was a full success. The conference was held every year thereafter and soon became internationally known as the "Bürgenstock Conference".[1] The Bürgenstock is a scenic mountain ridge, overlooking Lake Lucerne in the heart of Switzerland (Figure 1). While

Figure 1. The Bürgenstock with the Bürgenstock Hotels in the foreground which gave the conference its name; to the left is the Palace Hotel (with red-tile roof) where the Bürgenstock Conference was held over many decades; to the right, view over part of Lake Lucerne with Pilatus in the background. (Picture kindly provided by Bürgenstock Resort.)

"Bürgenstock" itself stands for top quality and exclusivity, the conference adds scientific excellence at the cutting edge.

There are many other outstanding international scientific meetings; what makes the Bürgenstock Conference so special? First, it concentrates on a relatively small number of carefully selected topics in chemistry and molecular sciences of life and matter, thus providing an excellent platform to sense current state-of-the-art and future developments in these important areas. Each topic is covered by a full-hour lecture by a prominent expert in the field with latest research results embedded in a type of minireview. Top scientific excellence and presentation quality is guaranteed by the careful selection of the speakers. Second, each lecture is followed by a half-hour discussion, which typically highlights important aspects for a second time and from diverse angles by representatives of different disciplines in the audience (Figures 2 and 3). Third, the conference program is kept secret and becomes known to the participants only at local registration. This guards against certain consumer attitudes with volatile attendance while attracting participants with genuine and broad scientific interests. Even the invited lecturers are typically not informed about their specific lecture day and time, which ensures that lecturers are committed to staying for the duration of the conference and will thus be available for scientific discussions during the whole time of the conference, thus also facilitating, in

Figure 2. An attentive audience! After every lecture many hands shoot up and questions are asked about relevant aspects from diverse scientific points of view: a half-hour-discussion after each lecture provides valuable expansions of lecture contents; picture from the 2010 conference.

Figure 3. Picture from the 2013 conference.

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particular, the interactions between junior and senior scientists. The principle of nondisclosure of the program is quite unique and has been a continuous challenge particularly in regard to industrial support; however, over a number of decades now, many industries have maintained their substantial support on the basis of the positive feedback from their delegates. Excellent frontier science at multidisciplinary interfaces has become a trademark of the Bürgenstock Conferences. Finally, participation is limited to some 120 participants to foster interactions between participants. Their admission to the conference requires confirmation by the acting president, who sometimes has to make allowance for even more. Participants are expected to stay for the whole conference, and partial participation is typically declined. This guarantees a full house for all lectures and continued discussions outside the lecture hall during the whole week of the conference. Intense networking has thus become another characteristic of the conference, and much productive multidisciplinary collaboration can be traced back to encounters on the Bürgenstock.

Stimulation and discussions are also enabled through poster sessions organized on two late afternoons. Each session is preceded by a short series of chaired eight-minute appetizers, selected by the organizing committee. Each poster session lasts for two days, thus providing ample time to digest all the information. Afternoons are typically used for recreational walks in a beautiful pre-alpine area, relaxed discussions inside or outside as weather permits, or sometimes short ad hoc presentations by a participant to contribute relevant unpublished results to a topic presented earlier during the conference.

It is an honor to be invited as a lecturer to the Bürgenstock Conference. Rarely have presidents or the organizing committee been turned down by invited lecturers. To guard against a regretful absence of a speaker, each lecture is chaired by a carefully selected chairperson from the same field who not only takes on the task of stimulating the discussion, but also is told to come with a prepared lecture to "step-in" just in case. This has indeed happened, but only in a very few instances over all 50 years of the conference. The speakers are selected by an acting president in collaboration with the members of the organizing committee. Together, they make sure that a broad range of relevant and hot topics are covered in each conference and that two to three of the best candidates worldwide are identified for each topic to be considered for invitation. There is the rule that no lecturer is invited twice as a speaker to a Bürgenstock Conference. This has sometimes put some pressure on presidents. Only in a handful of well-noted cases, particularly when a speaker had completely changed research fields, have exceptions to the rule been made. A president is expected to shape a program according to his or her broad scientific interests, but also to consider complementary topics together with the members of the organizing committee and their extended scientific networks. The first conference was organized and presided by the late André Dreiding, the "father" of the Bürgenstock Conference. It was then that the rules of the conference were laid down, never to be changed since.[1,2] The president of a Bürgenstock Conference has always been an eminent

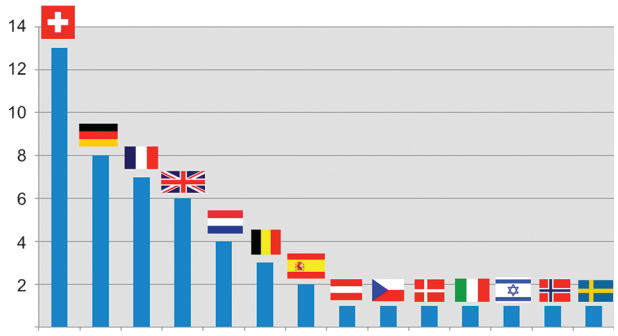

Figure 4. Histogram of nations contributing presidents to the Bürgenstock Conferences.

scientist and chemist from Switzerland, a European country, or Israel. This presidential carrousel started with a Swiss president, Duilio Arigoni from ETH Zurich, followed by presidents from eight different European countries before the turn came back for a president from Switzerland.[2] As can be seen from Figure 4, Swiss presidents have taken responsibility on numerous occasions. Presidents from Germany, France, and the UK have been in charge quite frequently, and some 10 other countries have also contributed highly successful presidents (Table 1).

Some 20 years ago, the concepts of a vice-president, as the president-elect of the subsequent conference, and the guest of honor have been introduced and have become strong traditions. The vice-president is invited to attend the conference one year before to convene with the organizing committee and discuss the concepts of the next conference, in particular the topics and the foreseen lecturers to be invited. These are typically most rewarding and intense discussions behind closed doors on one conference afternoon, in which chemistry in many of its facets, beauty, and transgressions into neighboring disciplines gets reviewed and most prominent scientists listed, thus shaping tempting options for the next conference. This then sets the starting point for pleasant work for the next conference, which begins right after the conclusion of the running event. The task of the president-elect is to convince desired speakers to join the next Bürgenstock Conference, while all the administrative, logistic, and financial aspects are being handled by the organizing committee. The guest of honor is an eminent scientist, most often a previous president of the conference or a frequent participant who has contributed much to the vitality of the conference. His nomination and invitation is the prerogative of the president-elect.

The basic program structure entails 14 lecture events, each with a generous 90-minute time slot, typically two in the morning, separated by a comfortable coffee break, and one in the evening after dinner. Early afternoons are free for recreational activities or special program events, and late afternoons are spent on poster sessions. One evening, midway through the conference, is reserved for a high-quality concert with music reflecting the president's special taste. This is sometimes a challenge for the organizing committee who will try its best to come as close as possible to the president's wishes.

Table 1: Presidents of the Bürgenstock Conferences 1965–2015.

1965	André S. Dreiding	Switzerland
1966	Duilio Arigoni	Switzerland
1967	Jean Jacques	France
1968	Jiři Sicher	Czechoslovakia
1969	Anders Kjaer	Denmark
1970	Egbert Havinga	The Netherlands
1971	Hans Musso	Germany
1972	W. David Ollis	United Kingdom
1973	Richard H. Martin	Belgium
1974	Jean-Marie Lehn	France
1975	Johannes Dale	Norway
1976	Sir Alan R. Battersby	United Kingdom
1977	Piero Pino	Switzerland
1978	Heinz A. Staab	Germany
1979	Sir Derek Barton	United Kingdom
1980	Jack D. Dunitz	Switzerland
1981	Jean Mathieu	France
1982	Rolf Huisgen	Germany
1983	Sir Jack E. Baldwin	United Kingdom
1984	Léon A. Ghosez	Belgium
1985	Marc Julia	France
1986	Ekkehard Winterfeldt	Germany
1987	Dieter Seebach	Switzerland
1988	W. Nico Speckamp	The Netherlands
1989	Rolf Scheffold	Switzerland
1990	*no conference*	*hotel reconstruction*
1991	Helmut Ringsdorf	Germany
1992	Guy Ourisson	France
1993	Wolfgang Oppolzer	Switzerland
1994	David N. Reinhoudt	The Netherlands
1995	Helmut Schwarz	Germany
1996	François Diederich	Switzerland
1997	Steven V. Ley	United Kingdom
1998	Manfred T. Reetz	Germany
1999	Javier de Mendoza	Spain
2000	Jean-François Normant	France
2001	Andrea Vasella	Switzerland
2002	Lia Addadi	Israel
2003	Jan-E. Bäckvall	Sweden
2004	Herbert Waldmann	Germany
2005	Alain Krief	Belgium
2006	Bernhard Kräutler	Austria
2007	Samir Z. Zard	France
2008	Don Hilvert	Switzerland
2009	Ben L. Feringa	The Netherlands
2010	E. Peter Kündig	Switzerland
2011	Jeremy K. M. Sanders	United Kingdom
2012	Andreas Pfaltz	Switzerland
2013	Luisa De Cola	Italy
2014	Antonio M. Echavarren	Spain
2015	Antonio Togni	Switzerland

Originally, the conference started with a welcome dinner on Sunday evening, the first lecture on Monday morning, and concluded on Friday evening with the last lecture, followed by a humorous wrap-up, and a long night. This concept lasted for more than three decades. Much of the typical events on, beside, and behind the stage have been summarized in the 25-year commemorative booklet on the "Euchem Conference on Stereochemistry Bürgenstock", edited by Rolf Scheffold, the president of the 25th Conference 1989, and his wife Monica on behalf of the organizing committee.[2] After the turn of the century, a few changes were made to the conference schedule, finally resulting in the start of the scientific program with a Sunday evening lecture right after the welcome dinner, and conclusion on Friday at noon. This scenario, which shortens the conference from six to five nights without changing the number of lectures, has now been in place for the last six years and will remain for the 50th conference as well.

What has remained essentially untouched, after a short initial settling period, over the whole 50 years has been the concept of 14 generous time slots for full lectures with extended discussions (Figure 5). There have only been slight variations. A full lecture was occasionally shortened to allow complementation by a short lecture to highlight a particularly interesting topic to stimulate and enrich the discussions. Although appealing in principle, this has been exercised only sporadically, thus granting all the time to one selected speaker. Only once did the appetite for more have the organizers not only splitting several full lecture slots but even organizing three complementary short presentations into one slot, thereby resulting in a record of 22 lectures for one conference. While quite colorful and stimulating, the resulting hectic and superficial discussions were a warning to the organizing committee and a caution to future presidents. The number of lectures per conference then rapidly relaxed back to the traditional 14 and has remained ever since with only one minor exception.

The scope of science that is covered yearly with 14 carefully selected lectures is amazing. Although the official title of the conference—Euchem Conference of Stereochemistry—has not changed over decades, it has been debated repeatedly, always converging back to "Stereochemistry". "Stereo" is not a material property, but a specific point of view addressing the three-dimensional aspects of molecules and matter. It signals an imperative to all speakers to pay due attention to molecular structural aspects in their research and presentation. The title thus remains most appropriate, providing maximum topical flexibility while emphasizing the structural point of view as the underlying and unifying principle in all diverse areas of chemistry, chemical biology, and physics. As a matter of fact, looking back on all 49 conferences, the title fits perfectly well to each and embraces the many common as well as divergent topics. Figure 6 provides a qualitative overview of the topics and the abundance of coverage over all 50 years. There are "evergreens" that have been covered at each conference and are likely to be covered also in the future, such as synthetic methodology, catalysis, including organometallic and metal complex chemistry, reaction mechanisms, stereochemistry and stereoelectronic control, regio- and stereoselective synthetic approaches, natural compound chemistry, and total synthesis. These cardinal areas of synthetically oriented

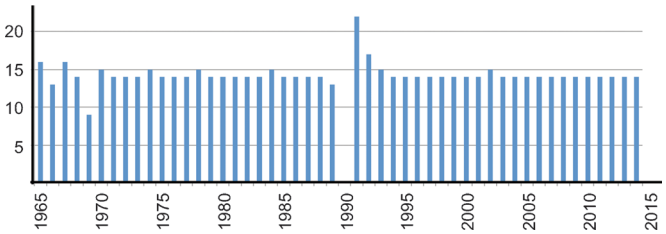

Figure 5. Number of invited lectures at Bürgenstock Conferences from 1965–2014.

chemistry (colored in yellow to ocher) have been regularly complemented by contributions in structural chemistry, discussions on conformation and reactivity, molecular recognition and noncovalent interactions (colored in blue tones), as well as chemical concepts, theoretical and computational chemistry (gray colors). Special or unusual molecular architectures have attracted continuous attention over all the years (red tones), while molecular self-assembly or self-organization as well as the design of novel functional materials have come into focus only over the last 25 years (Figure 6 bottom). The synthetic, structural, theoretical, and material-oriented parts of chemistry fill about 71% of the pie (Figure 6 top). The remaining part is predominantly biology-oriented chemistry (green colors) in its most diverse manifestations (ca. 24%), whereas physical and (bio)analytical chemistry (violet tones) cover the remaining part (ca. 5%). It is interesting to compare the 1st 25-year term (Figure 6 bottom left) with the 2nd (Figure 6 bottom right), of which we of course only know the programs of 24 events until 2014. The most evident change is the massive relative growth in biology-oriented chemistry by some 50%. The predominant drivers may be found in the molecular investigation and understanding of key biological and cellular processes, the design of novel chemical tools for their analysis, modification, and use for new biotechnological processes, with concomitant emphases on structural biology, analyses of biomolecular function in virtually all areas of biochemistry and biological matters. Another massive change is seen in the number of contributions to the design, synthesis, and analysis of novel functional materials, very often by the design of molecular building blocks for the construction of three-dimensional objects by self-assembly and self-organization. Not surprisingly, these trends are paralleled by an enhanced focus on noncovalent interactions and molecular recognition. The emphasis on applied chemical research towards material sciences, physics, and biology, by ever more sophisticated combinations of basic science on molecular structure, property, and function with the design of chemical tools, probes, and functional materials has markedly increased from the 1st to the 2nd 25-year period at the cost of synthetically oriented chemistry areas. While these trends will likely continue in the future and may reflect a certain maturity of synthetic chemistry, it is evident that synthesis-oriented chemistry will never disappear. The Bürgenstock Conferences give vibrant testimony of the never ending string of synthetic innovations, novel catalysts, and ingenious concepts of stereocontrol in asymmetric synthesis. The pool of natural compounds is endless, and synthetic targets are not only chosen on the basis of sheer structural complexity, biological potency, or therapeutic relevance, but ever more so to address synthetic access to challenging structural motifs, to explore short convergent syntheses, or design divergent strategies to access molecular diversity. There is no end to chemical ingenuity.

Apart from shaping the next conference program, the president-elect also has the responsibility to oversee and approve the applications of participants, in particular those from the most promising young scientists applying to the Junior Scientist Participants (JSP) Program, which was initiated over 20 years ago and has established a wonderful tradition that offers opportunities for mutually beneficial contacts and inspiring collaborations between junior and senior scientists, often across disciplinary boundaries. The JSP

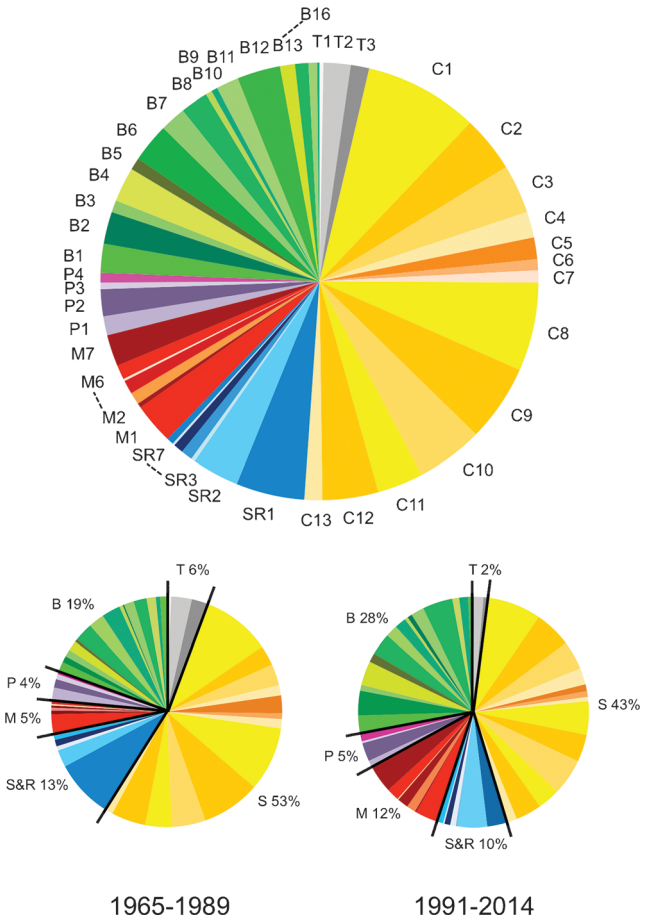

Figure 6. Top: Frequency of coverage of topics in a total of 700 invited lectures of 49 Bürgenstock Conferences from 1965–2014. T1: basic principles in stereochemistry; T2: chemical concepts; T3: theoretical chemistry; C1: synthetic methodology; C2: catalysis; C3: organometallic chemistry; C4: metal complex chemistry; C5: reactive intermediates; C6: radical chemistry; C7: photochemistry and excited states; C8: mechanistic chemistry; C9: stereochemistry and stereoelectronic control; C10: regio- and stereoselective synthesis; C11: total synthesis; C12: natural product chemistry; C13: medicinal and agricultural chemistry; SR1: structural chemistry, conformation and reactivity; SR2: molecular recognition, nonbonded interactions and solvation; SR3: chemistry in the gas phase; SR4: chemistry in, on, of the solid state; SR5: chemistry on surfaces; SR6: chemistry at interfaces; SR7: flash, flow, and combinatorial chemistry and libraries; M1: special molecular architectures; M2: host–guest chemistry; M3: supramolecular chemistry; M4: liquid crystals; M5: polymers; M6: self-assembly and self-organization; M7: functional and nanomaterials; P1: spectroscopy; P2: physical chemistry and physics; P3: thermodynamics and kinetics; P4: (bio)analytical chemistry; B1: biology; B2: biological and cellular processes; B3: biochemistry; B4: biology-oriented chemistry and biotechnology; B5: biosynthesis; B6: structural biology; B7: biomolecular function and reactivity; B8: enzymes and enzyme mechanism; B9: receptors; B10: channel, transport, carrier systems; B11: DNA, RNA, and nucleotide chemistry; B12: proteins, protein chemistry; B13: peptides and amino acid building blocks; B14: carbohydrates and sugar chemistry; B15: lipids and membranes; B16: polyketides. Bottom: Frequency of topical coverage in the 25-year period 1965–1989 (left) and 24-year period 1991–2014 (right).

Program has been enabled by generous support from the European Science Foundation for many years, then by the Swiss National Science Foundation, the Verband Chemischer Industrie in Germany, and the Swiss Academy of Sciences, and for the last eight years by the Division of Chemical Research of the Swiss Chemical Society. The JSP Program allows the president and the organizing committee to accept approximately 15 young scientists at the beginning of their academic careers to participate at a Bürgenstock Conference. They come from all over Europe and Switzerland and are selected on the basis of their proven scientific track records as well as recommendations by former presidents or presidents of national academies of science.

An important group of participants are those from industry. Industrial participation is in conjunction with a donation to the costs of the conference and thus represents an important source of financial income and a key element of sustainability. Although the organizing committee has been responsible not to oversubscribe industrial participation, a healthy mix of academic and industrial participation has been most beneficial for the conference, fostering exchange between basic and applied, general, and focused research. Many companies have taken care to nominate broadly interested scientists with a healthy disposition to communicate and participate in public discussions. Nominations to participate at a Bürgenstock Conference have often been handled by industry as a special reward for particularly outstanding scientists. Therefore, industrial participation has always been a strong added value to the conference.

Administrative and technical assistance during the conference provide further opportunities for young scientists to participate at the conference. These are typically PhD students from the research groups of the president and the academic members of the organizing committee. While there is considerable work during a conference, there are also many opportunities for them to enjoy the science and the many interactions with senior scientists from all over the world. Indeed, many lasting contacts have been initiated at the Bürgenstock Conferences. Some tasks of the assistants have changed in a characteristic way over the years, from manually moving slides, to the management of more automated slide projectors, to just beamer control with PowerPoint presentations, sometimes still struggling with limited hardware compatibilities or embedded videos. Chalk and blackboards have been there from the beginning and have remained unchallenged by the pervasive electronic revolution. The revolving blackboards on stage have retained their importance, particularly regarding the extended discussion sessions (Figure 7), not only for arguments and explanations, but also to list the names associated with voting hands to ensure fair handling of pending questions (Figure 8). Sometimes, the chair person would permit a change of the indicated sequence of votes when intense hand waving in the audience would indicate some important comments to a given matter, and of course chair persons have the prerogative to complement with their own comments or follow-up questions. Chalk, and in particular colored chalk, has been used heavily over many years for the final wrap-up event after the last lecture, scribbling over many blackboards on both the front and back sides, with much animated stage walking craft. However, these events have also become computer-assisted: still fully animated, but now by PowerPoint.

Figure 7. Intense discussions are typical for the Bürgenstock Conferences, as can be guessed from the hand gestures collected during a discussion session (2007 conference).

Another responsibility attributed to the assistants over the last 20 years has been the conference photo documentation: taking pictures at the beginning and end of each lecture, during discussions, at poster sessions, and during coffee breaks (Figure 9). Photography is forbidden during lectures to allow speakers to present their latest unpublished results, and offer hypotheses or speculations for discussion—a rarity in today's conferences. The dramatic developments in commercial photography from analog to digital pictures around the turn of the century have made a big change in organizing post-conference documentation. The envelopes of a few selected pictures taken by diverse participants in the early years of the conference were soon replaced by richer collections of paper copies filling first small, later big, photo albums for the conference archive—an ever more exhausting task of photo cutting and gluing. Finally, high-resolution digital photography has enabled the easy and totally computer-assisted production of annotated documentations not only for the conference archive, but also for the president and other interested recipients.

As years go by hotels get older. The Bürgenstock Park Hotel is no exception and had to be rebuilt. That happened in 1990. The whole Bürgenstock became a big construction area, and the Bürgenstock Conference could not be held at the adjoining Palace Hotel as usual. After some deliberations, the organizing committee decided to skip the event that year. Would the Bürgenstock Conference label be strong enough to enable an unabridged restart thereafter? Indeed it was! The conference resumed with full power and success in 1991 as if it had never stopped in between. Some 15 years later a next and even bigger reconstruction project on the Bürgenstock was looming, and profound renovations and new constructions were planned. For two years then, the conference was moved to the Hotel Fürigen, a wonderful

Figure 8. Chairman and lecturer in front of a blackboard with the listed names of announced discussion participants; the listing of the names serves to identify the discussion partners and ensures a smooth course of the discussion without overlooking or forgetting a contributor (2011 conference).

Figure 9. Discussions may continue into the coffee breaks often taken outside in a relaxed atmosphere.

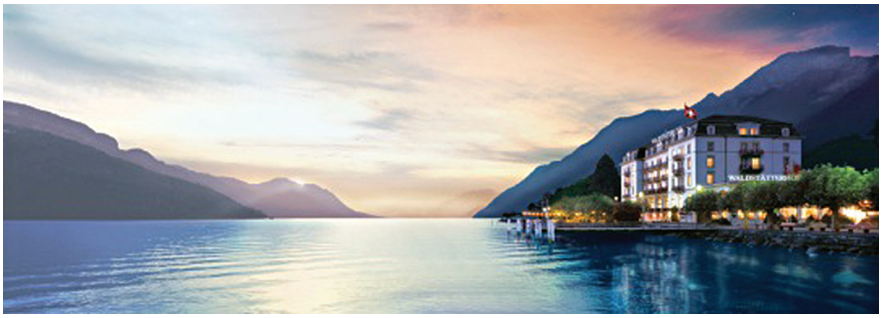

Figure 10. The Seehotel Waldstätterhof at Lake Lucerne is the new home of the Bürgenstock Conference; the golden sunset over the Bürgenstock in the west illuminates the Waldstätterhof. (Picture kindly provided by Seehotel Waldstätterhof.)

place just a few hundred meters below the Bürgenstock. However, the hotel capacity was not sufficient and distributed accommodation had to be organized with bus shuttles. This was acceptable as a short term measure only. With work at the original site experiencing delays of several years, it became evident that a new location had to be found. After a search of many alternatives, the committee found a best fitting location in the Seehotel Waldstätterhof in Brunnen, surrounded by a quiet private park directly on the shores of Lake Lucerne (Figure 10). So, after over 40 years on the Bürgenstock, the conference came gradually down to lake level, finding a new home that offers excellent accommodation and modern infrastructure. It has turned out to be an ideal place in all respects for the Bürgenstock Conference for the last seven years and hopefully many more to come. Brunnen is not just one of the many villages at Lake Lucerne. It is situated at a very prominent location, where Lake Lucerne makes a sharp turn from its overall west-east direction to the north-south arm reaching into Canton Uri. Brunnen sits right at the northern tip of this turn and is fully exposed to the warm winds from the south, the foehn, which gives rise to impressive and sometimes sudden climate changes to unusually warm temperatures, heavy storms, and agitated waters. The hotel also faces the famous Rütli Meadow just across the lake where Switzerland was founded. However, and perhaps more importantly, the new site of the conference is not very far from the original location, just 16 km east of the Bürgenstock. Thus, the conference remains in the sun of the Bürgenstock, keeping its spirit and rules, exclusivity and quality, and hence also its name.

In 2015, the 50th Bürgenstock Conference will take place. Without doubt, this will be another great scientific event. May the Bürgenstock Conferences keep their momentum to start another successful round of 25 years.

Klaus Müller studied chemistry at ETH Zurich (PhD in 1970 with Prof. Albert Eschenmoser) before carrying out research in the US for 4 years (Postdoc in Chicago with Prof. Gerhard L. Closs, Lecturer at Harvard). He then returned to ETHZ in late 1974 (Habilitation in 1977), and finally joined Roche in 1982, where he occupied several leading positions prior to his retirement in 2009. He was Board Member of the Roche Research Foundation until its conclusion in 2008 and has since then managed the Roche Postdoc Fellowship Program. Since 1991 he has been Extraordinary Professor at the University of Basel. 1982–2009 he served on the organizing committee of the Bürgenstock Conference.

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