Report on Flow Analysis VII

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The VIIth International Conference on Flow Analysis was held August 25-28 in Áquas de São Pedro, Brazil, near Piracicaba where much of the pioneering work in flow injection analysis was accomplished. The conference followed Flow Analysis VI held three years earlier in Toledo, Spain, and was dedicated to Henrique Bergamin Filho who suddenly died in December, 1996 before he could enjoy the fruits of his preparation for the conference.

Professor Elias A. G. Zagatto assumed the role of General Secretary of the conference, and is to be congratulated on a successful meeting. He was ably assisted by many of his colleagues, and Bergamin's daughter, Cynthia, was particularly helpful in the arrangements.

There were some 200 participants representing 23 countries. The conference opened with a tribute to Professor Bergamin by Dr. José Roberto Ferreira, followed by a plenary lecture by Jaromir Ruzicka (University of Washington: From Flow Injection to Sequential Injection and from Instruments to Sensor Systems). Plenary lectures were also given by Miguel Valcárcel (Universidad de Cordoba, Spain: Coupling Continuous Flow Systems to Instruments Based on Discrete Sample Introduction) and Célio Pasquini (Universidad Estadual de Campinas, Brazil: Flow Analysis Made in Brazil).

Six invited lectures set the tone for the remainder of the conference: Toshihiko Imato (Kyushu University, Japan: Potentiometric Flow Injection Determination of Concentrated Metal Ions by Using Copper(II) Ion Buffer Solution Prepared by Polymer Ligand); Bernard Welz (Bodenseewerk Perkin-Elmer GmbH, Germany; Flow Injection Separation and Preconcentration Coupled to Graphite Furnace Atomic Absorption Spectrometry); Marcella Burguera (University of Los Andes, Venezuela: Microwave-Assisted On Line Sample Decomposition in Flow

Analysis); Gyorgy Marko-Varga (Astra Draco Ab, Sweden: Flow Immunochemical Detection Principles in Human Cell Lines and Urine for Screening Purposes); Miguel de la Guardia (University of Valencia, Spain: Speciation in Flow Analysis) and Stanley Crouch (Michigan State University, USA: Capillary Flow Injection: Performance Under Pressure).

There were 31 additional oral presentations as well as 129 poster presentations, lending a flavor of the diverse types of flow analysis research across the globe. There are too many to mention, but a few representative topics will indicate this variety and the international scope, as described by the presenting authors of several teams of collaborators.

B. Lendl (Vienna University of Technology, Austria) described the use of FIA-FTIR for chemical analysis in aqueous solution. Bo Karlberg (Stockholm University, Sweden) gave a review of multi-analyte determination techniques in FIA. Elo Hansen (Technical University of Denmark) reported on the determination of ultra trace levels of Cr(VI) by FI-ETAAS with on-line preconcentration. Jose Luis Burguera (University of Los Andes, Venezuela) described the automated determination of iron in geothermal fluids using an on-line microwave radiation precipitation-dissolution system. Orlando Fatibello-Filho (Universidade Federal de São Carlos, Brazil) determined sulfite using a crude extract of sweet potato as a source of polyphenoloxidase. Marek Trojanowicz (University of Warsaw, Poland) determined ammonia with amperometric detection using a polyaniline modified platinum electrode. F. Mas-Torres (University of Balearic Islands, Spain) determined phosphate by sequential injection analysis (SIA) by electrogeneration of molybdenum blue. N. Teshima (University of Tsukuba, Japan) measured the complexing capacity of metal ions by reverse FIA.

Miroslav Polásek (Charles University, Czech Republic) presented a critical survey on the use of FIA in pharmaceutical analysis. Nils Kullberg (Åbo Academi University, Finland) reported on a software approach for SIA control. Yuri Zolotov (Russian Academy of Science and Lomonosov Moscow State University, Russia) used flow methods with sorption preconcentration for determining metals in natural waters. Ian McKelvie (Monash University, Australia) eliminated the Schleiren (refractive index) effect with saline samples by matrix matching in the carrier. Julian Tyson (University of Massachusetts, USA) determined

Figure 1. Elo Hansen, Jarda Ruzicka, and Elias Zagatto enjoying the Scientific Committee dinner.

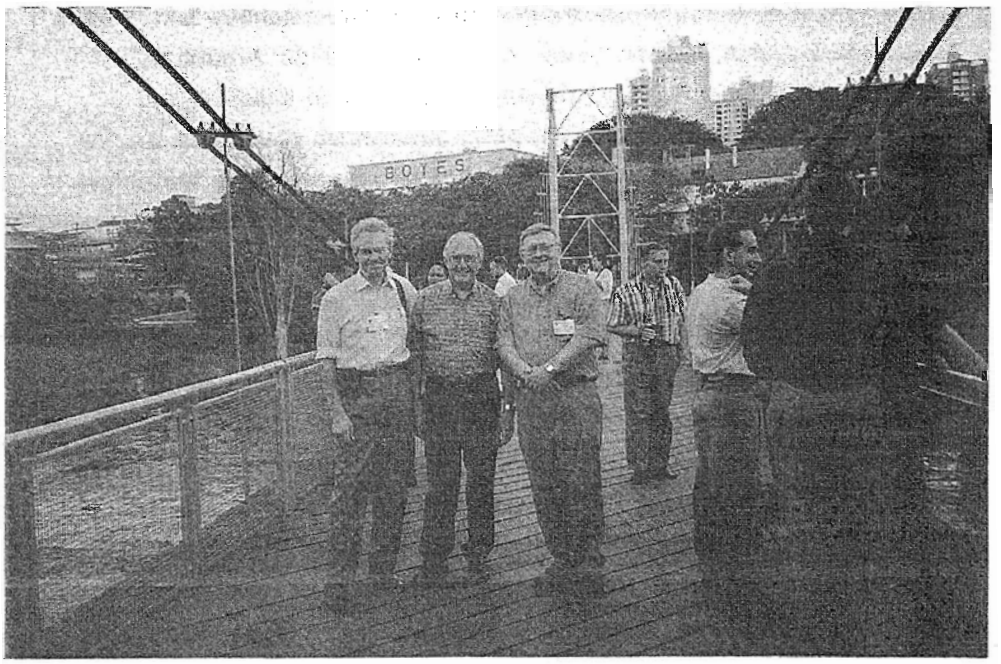

Figure 2. Yuri Zolotov, Gary Christian, and Stan Crouch enjoying the sights of Piracicaba.

chloride using membrane reagent introduction. Paul Worsfold (University of Plymouth, UK) described flow injection for remote monitoring of environmental processes.

The posters provided the bulk of the present day research in flow analysis. There was a large contribution from the Brazilian hosts, reflecting the on-going innovative work in that country. A few examples include: On-line microwave slurry sample digestion, by Edenir R. P. Filho et al. (University of Campinas); Continuous flow-precipitation-dissolution for silver preconcentration by Otoniel Domingos de Sant'Ana, et al. (Federal Fluminense University); Real-time simplex optimization of FI systems, by Maria Fernanda Giné et al. (Universidade de São Paulo CENA-USP); kinetic determination of uric acid using a single-line flow-system with multisite detection, by Alberto N. Araijo et al. (Porto, Portugal and CENA-USP); spectrophotometric determination of ozone with gas-liquid transfer using a mincroreactor, by Ênio L. Machado et al. (Universidad Federal de Santa Maria); flow injection methods for anion determination in waters, by Francisco José Krug et al. (CENA-USP); and an FI system employing vacuum pumping, by Antonio O. Jancintho et al. (CENA-USP). There were numerous other novel contributions from Brazilian scientists.

Other countries represented in the oral presentations and posters included Lithuania, France, South Africa, Netherlands, Argentina, Portugal, Hungary, Greece, Uruguay, Slovenia, and Cuba.

The conference concluded with a roundtable discussion on flow analysis in education. Panelists concluded that more material on flow analysis needs to be included in modern analytical chemistry courses, with more emphasis in textbooks. The current availability of inexpensive pedagogical FIA instruments and flow cell detectors should encourage the introduction of FIA into the teaching laboratory.

The Scientific Committee determined that Flow Analysis VIII will be held in Warsaw, Poland in 2000. A Web page on Flow Analysis will be maintained by Julian Tyson at the University of Massachusetts. Contact him at tyson@chem.umass.edu for information.