Guest editorial

In September 2009 (6th to 9th), 146 participants from Europe, Asia and America met in Karlsruhe at the 8th European Coating Symposium (ECS 2009) to learn and talk about the latest developments and progresses in coating and drying of thin films. The symposium was organized and chaired by Prof. Wilhelm Schabel and the group Thin Film Technology from the Institute of Thermal Process Engineering at the Karlsruhe Institute of Technology (KIT). Roughly one-third of all the interesting contributions and research works that were presented at the Symposium were selected by the Scientific Committee to be peer reviewed and published in a Special Issue. The Chemical Engineering and Processing Journal offered a Guest Editorial to publish a Special Issue: Advances in Coating and Drying of Thin Films. In particular, many thanks to the editor, Prof. Gabriel Wild (Nancy), for his kind support.

At the beginning of the symposium Professor Emeritus Dr.-Ing. Dr. h.c. mult. Ernst-Ulrich Schlünder was honoured on the occasion of his 80th birthday by his former students, Holger Martin and the symposium chair Wilhelm Schabel. The Symposium Community decided to dedicate the contributions of this Special Issue of Chemical Engineering and Processing to Ernst-Ulrich Schlünder on this anniversary occasion (6th September, 2009).

Holger Martin presented a laudation on the 80th birthday of his “doctor father” at the opening session of the symposium. A summary of this laudation is highlighted here in this preface of the Special Issue as following:

Ernst-Ulrich Schlünder, “OCTOGENARIAN”

Emeritus Professor Dr.-Ing. Dr. h.c. mult. Ernst-Ulrich Schlünder held the chair of Thermische Verfahrenstechnik (TVT, Thermal Process Engineering) at the Universität Fridericiana, at Karlsruhe, (now Karlsruhe Institute of Technology, KIT), from 1967 to 1997. His predecessor on that chair, Emil Kirschbaum, was the first to teach Chemical Engineering in Germany beginning in 1928. Ernst was supervisor of both my Diplom-Arbeit (comparable to a Master’s thesis), and my doctoral dissertation. In German, we call a PhD supervisor “Doktorvater”, so, in an academic sense, I am one of the more than 80 ‘sons’ of Ernst. After I was made a professor myself, in 1980, we became not just colleagues, but even friends. Like many others of his former students, I learned a few lessons from Ernst which served as guidelines for a whole professional life as a chemical or process engineer, whether in industry, or in academic research and education. One of these lessons might be formulated briefly as, “Never trust what you can read in manuscripts, journals, or even textbooks. Check it yourself!” And Ernst taught us how to check scientific statements in a rigorous yet economic way.

He was very successful in research and teaching during the last half century. More than 500 highly original contributions to the relevant scientific literature were published by him in the fields of heat and mass transfer and thermal separation processes. He edited two great handbooks, the German standard handbook of heat transfer, the VDI-Wärmeatlas, from the 2nd to 8th edition (1974–1997) and the international Heat Exchanger Design Handbook, HEDH (1983) in five volumes as editor-in-chief and author of some important chapters. Presently the 10th German edition (2006), and a 2nd English edition of the VDI-Heat Atlas (2010) are on the market.

He received many awards (like the Arnold Eucken Preis, in 1966, and the Arnold Eucken Medaille, in 1984, the Medaille Gustave Trassenster, in 1987, the Award for Excellence in Drying Research, in 1988 at Versailles, France, as well as the Ernest Solvay Preis, in 1998).

Ernst Schlünder was a guest professor at the Departments of Chemical Engineering of the Indian Institute of Technology, Madras, India, in 1970/71, and the University of California, Berkeley, USA, in 1978/79, at the Ecole Nationale Superieure des Industries Chimiques, Nancy, France, in 1980/81, at the Departments of Chemical Engineering of the University of Canterbury, Christchurch, New Zealand (with a Tasman Fellowship), in 1982, and at Trinity College, University of Cambridge UK, in 1986.

He received honorary doctorates from l’Institut National Polytechnique de Lorraine, Nancy, France, in 1987, from the University of Surrey, Guildford, England, in 1997 and from the Slovenská Technická Univerzita, Bratislava, Slovakia, in 1999.

One characteristic example of Ernst Schlünder’s very special, critical view of his own field of heat and mass transfer can be found...
in the VDI-Wärmeatlas and in his HEDH chapter on fundamentals of heat and mass transfer, 2.1.0 Introduction, on p. 2.1.0-2:

"There is no doubt that Nusselt was completely right and that only two mechanisms of heat transfer can be distinguished physically: heat transfer by conduction and heat transfer by radiation."

Practically all other existing texts on heat and mass transfer still today claim that there were three mechanisms of heat transfer: radiation, conduction and convection. In his lectures on heat and mass transfer, Ernst clearly explained that 'convection' is nothing but transient conduction to moving media, in a coordinate system moving with the fluid.

Nearly everyone teaching heat and mass transfer today knows about this simple fact, but nevertheless most of our colleagues tell their students, that there were three mechanisms, or 'kinds' of heat transfer. This discrepancy in the fundamental understanding of our common subject has been splitting the community since 1916. Ernst Schlünder had known this from the beginning of his academic career, but he never insisted on his clear opinion. In Karlsruhe, we followed Ernst Schlünder's (and Wilhelm Nusselt's) ideas after 1967, and always taught that there were only two mechanisms of heat transfer, but the rest of the world simply seemed to ignore this matter of fact.

But this was only one peculiarity of Ernst's ideas about teaching heat and mass transfer. He broadened the fields both in heat transfer and especially so in mass transfer. Coming back from his guest professorship at Berkeley, California, he introduced at Karlsruhe a new compulsory course on mass transfer (not including the thermal separation processes), taking, like the heat transfer course, a full semester! He wrote a small new book on Mass Transfer, which was different from all available texts on that matter at the time.

As an Emeritus, he continued teaching and doing his own research at various places, like the University of Miami, for a few years, then at the Max-Plank-Institut für Dynamik komplexer technischer Systeme, at Magdeburg, and here at the Karlsruhe Institute of Technology, in Germany.

We and all the contributors to this Special Issue congratulate Ernst-Ulrich Schlünder to an extraordinarily successful career in research and teaching and to his outstanding contributions to our knowledge in the fields of heat and mass transfer, drying technology and thermal separation processes. We wish him all the best for his health and for his activities and challenges in the future.

Acknowledgment

I would like to thank my friends Wilhelm Schabel and Holger Martin for the publication of this special issue.

In particular my most sincere thanks are given to my former wife Inge and my wife Eva. With their care as well as their loving and generous affection they created the scope for my professional activity without which successful scientific work would not have been possible.

Ernst-Ulrich Schlünder
Ettlingen, December 2010

Danksagung

Ich danke meinen Freunden Wilhelm Schabel und Holger Martin für die Herausgabe dieses Sonderheftes.

Mein ganz besonderer und herzlicher Dank gilt meiner früheren Frau Inge und meiner jetzigen Frau Eva. Sie haben mir dank ihrer Fürsorge, sowie ihrer liebevollen und selbstlosen Zuwendung den Freiraum für meine berufliche Tätigkeit geschaffen, ohne den eine erfolgreiche wissenschaftliche Arbeit nicht möglich gewesen wäre.

Ernst-Ulrich Schlünder
Ettlingen im Dezember 2010

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Advances in Coating and Drying of Thin Films
dedicated to E.U. Schluender

Edited by

Wilhelm Schabel
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