Barbara Dalpke: insights from a recent graduate

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Barbara Dalpke recently completed her doctoral studies at the University of British Columbia, in Vancouver, BC, Canada. Her research there has centered on jet impingement modeling. She has presented her findings at recent conferences and her findings have already been referenced in other research.

A native of Germany, she received an engineering diploma from Darmstadt University of Technology, then journeyed a third of the way around the world to begin her graduate work.

Dalpke became acquainted with the paper industry early on. "My dad worked in a combined pulp and paper mill in Alfeld, Germany, looking after the pulp mill operation for some time. Later he was responsible for the wastewater treatment plant, and environmental concerns in general. So he sometimes took us and showed us around. As a little girl, I found those huge machines immensely interesting. Later on, I really thought pulp and paper would be something that interested me, although a lot of people thought this would not necessarily be a good career choice (mainly because I was a woman, and the paper industry in Germany was, and probably is, still very conservative). Being a little stubborn sometimes, this couldn't deter me from entering the pulp and paper program at Darmstadt," she said.

Barbara Dalpke at work in Vancouver.

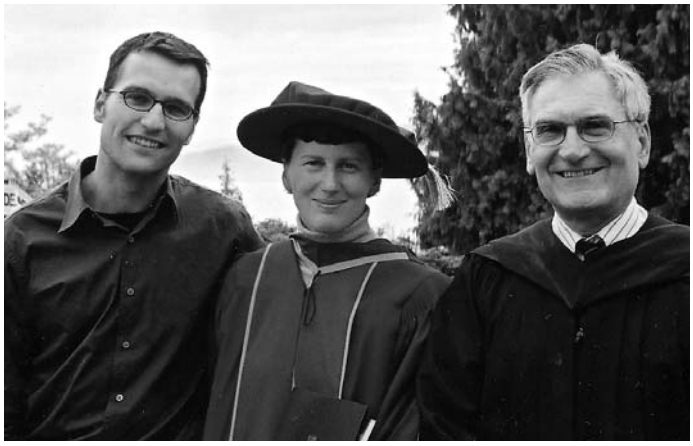
Having become educated the European way, Dalpke noticed subtle differences when she came to study in Canada. "One of the main differences I noticed is that studying here at UBC was more guided than in Darmstadt. There was often weekly homework to do and to hand in, and extra exercises for practice; and you really go to the lectures," she said. "In Germany, you are more on your own. You know what material will be covered throughout the year, but it's up to you how to learn it." Consequently, many students view lectures for basic courses as an ineffective way to spend their time. "All you are asked for is to write and pass the exam at one point [when is determined by the student]. I think this is one of the reasons why students in Germany often need longer to finish their programs: It takes a lot of self-discipline and organization to follow a program through in the 'suggested' time. However, once you leave school, you are very independent, and know how to organize your time. Here at UBC, students often leave school and still need to be told what to do next, because they were always guided in that way.

"On the other hand, I liked the project approach in courses here. In nearly every subject you get to do a term project (at least on the graduate level), which usually involves teamwork. Having to work on a project means you have to draw connections between knowledge from different courses, and it's also the way you most probably will work once you leave school. In Germany, we didn't do a lot of projects, it was more learning the facts and skills, without really learning how to apply them in different situations," Dalpke said.

For her thesis topic, Dalpke developed a computer model that predicts the hydrodynamics during jet impingement and early roll forming. "One of the biggest challenges in the model is to describe the drainage resistance of the fabric and fiber mat. There are still many open questions regarding drainage resistance, so questions in this direction were the most difficult to answer during my defense. In particular, I remember being asked about how my model and the outcome of my model would change if the boundary layer along the fabric/fiber mat was turbulent (my model is based on the assumption of laminar flow). Turbulence is very hard to understand, and even people who are experts in turbulence often admit they don't really know 'what's going on.' I don't consider myself at all an expert in turbulence, so I remember trying to get around that question a little bit, by pointing out that the scale used in my model doesn't really resolve the boundary layer anyway," she confided.

"The most satisfying aspect in my research was engaging in the ever continuing struggle: you have a problem and you have tried everything (at least that's how it seems), and even though sometimes you are close to giving up, suddenly and unexpectedly you find (at least part) of the solution," Dalpke explained. "Of, course that only brings up new problems, and you start trying everything, until suddenly...and so on. The small victories on the way, that's what keeps you motivated and going."

One of Dalpke's papers–on jet impingement modeling–was published by TAPPI in February 2001. She also presented papers at TAPPI's 2001 Engineering Conference in San Antonio, Texas, and at the 2002 PAPTAC Annual Meeting in Montreal, Quebec. Both were about jet impingement modeling on a single fabric with the fiber mat build-up included. She is also working on two more papers, one about experimental validation of the model for impingement on a single fabric, the other one on impingement in roll forming which she may present at the Canadian Chemical Engineering Conference in Vancouver this fall. Studies with professor Sheldon I. Green and another student on measurements of pulp mat properties in a simple flow loop may be published later this year, also.



Dalpke receives her doctorate, accompanied by Joerg Hartung (left) and Richard J. Kerekes, (right).

Hiking in Garibaldi Park in the mountains of British Columbia.

For the next year, Dalpke will stay at UBC and work with Richard J. Kerekes on a couple different projects. That will also give her some time "to think about what I really like to do afterwards." She has developed a good knowledge of fluid dynamics, but she also has a personal interest in the environmental side of pulp and papermaking. She may decide to stay in research or take a job in the industry. "We'll see what I'll be thinking in a year!"

"My personal concern regarding a career in pulp and paper is that it seems less and less money is invested in research. I find this a dangerous path. Even though it is hard to measure the return from research work in dollars, and often you hit a dead end and there won't be any return, imagine where we would be today if only research was done which had a guaranteed positive outcome. A lot of the big achievements in history were unexpected byproducts of research that itself probably did not lead to anything in the end. Still, it was important to do it. That's why I would like to see more money for basic research in pulp and paper," Dalpke said.

"Other concerns I hear from students regarding a career in pulp and paper are that it seems an old-fashioned industry with little future, which is something I disagree with, but probably more needs to be done to achieve a more positive picture of the pulp and paper industry. Of further concern are the ongoing mergers and corporate reorganizations of recent years. There seems to be no workplace stability; instead, employees wonder if their company–and they–will be next, whether they will be laid off or shifted to another position or maybe another location. Another concern is that most pulp and paper mills are situated in or near small towns, and many students are not willing to give up the amenities of the big cities.

Which research areas does Dalpke view as important for the industry? It depends. "For me, environmental issues are still a concern that should be addressed, even though much has been done. I think energy efficiency is another important issue. Back in Germany, energy is one of the major costs in the industry, and reducing energy needs has the potential of huge savings. In BC, added value is a big issue. I think an important step was taken by starting the Advanced Paper Initiative a couple years ago. It means resources are now available to strengthen the post-secondary programs at BCIT and UBC and to look into problems of how the industry can get the most value out of the fiber supply they are dealing with."

Outside of her work at the university, Dalpke has a long list of hobbies. "A lot of them are perfectly suited to where I live now, Vancouver: I love the outdoors, enjoy hiking, kayaking, skiing in winter. I also love to play volleyball, perfect here in summer on a nice evening at the beach," she said. She also participated in a triathlon, ranking relatively high among the participants. "I go swimming regularly, running sometimes, and I take my bike for commuting nearly everywhere, so I thought it was worth a try. I actually didn't do too bad that one time, but I realized I didn't have enough time to seriously start doing triathlons."

In addition to sports, Dalpke enjoys going to movies, mostly independent foreign ones, often a little offbeat. "I enjoy good books, although I hardly find the time, and from time-to-time a good theatre piece or classical concert. My newest hobby is volunteering in a wildlife rescue center, which deals mostly with injured and orphaned urban wildlife, birds, and little critters. It is really interesting; I learn a lot about the animals living in the city, and for a refreshing change it is something completely different from what I do at school all day long!" **TJ**

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