My World:

the Life and Times of a Civil Engineer - Autobiography of IAHR Honorary Member Peter Ackers

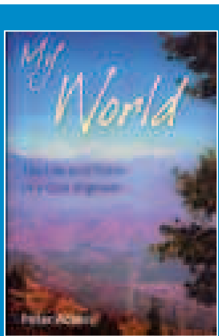
(Extract from; My World: the Life and Times of a Civil Engineer, published by The Memoir Club.)

This autobiography of IAHR Honorary Member Peter Ackers published by The Memoir Club in 2007 is a fascinating glimpse into the life of an exceptional civil engineer from the UK living in exceptional times, and is thoroughly recommendable.

Peter Ackers embarked on his career as an engineer by winning a prized scholarship to study at Imperial College right in the middle of the Second World War. He describes a unique undergraduate experience having to complete his degree in only two years in a London under, at times, heavy bombardment. After a short period of obligatory service in the post-war aircraft industry he finally started as a junior engineer working on drainage projects in northern England where he first developed his interest in Hydraulics. Whilst designing an overflow weir he realised that the methods used at that time were inadequate, and in his spare time, and using published data, he worked on a new approach which was presented in a paper to the Institution of Civil Engineers! After several years in the world of practical municipal engineering his ever-increasing interest in hydraulic research got the better of him, and in 1956 he successfully applied for a post as Senior Scientific Officer at the Hydraulics Research Station in Wallingford newly-established by Sir Claude Inglis who had been Director of the Research Institute in Pune in India up to independence.

This short except from Peter Ackers' Autobiography describes the development of the Ackers-White formula:

"…One of the topics that was important at that time, both in terms of basic understanding and in applying any advance to modelling was the transport of sediment by flowing water. How did this relate to all the variables such as channel depth, gradient, velocity and the range of sediment sizes? There were many equations available which would predict widely different values for the transport rate depending upon which formula you favoured. A great deal of data had been collected from experiments in laboratory flumes but it seemed as if researchers were not interpreting them in such a way as to give convincing or even compatible predictive functions. We carried out experiments at Wallingford on models having mobile beds of sand or fine gravel and laws of similarity told us what sediment to use for a given model scale in certain clear-cut cases, but there was no way that problems in rivers and estuaries with fine sand beds could be modelled with certainty. There was the possibility of using artificial materials with specific gravity much below that of natural sand, but this was very risky as was shown by a model of Morecambe Bay, which used chopped up cubes of wood about 1 or 2mm in size. Not to put too fine a point on it, it was a disaster – but luckily it was the responsibility of one of the other divisions. Although there was little direct funding for research on this vexed topic, I set out to get my brain around it, building on the theoretical work and laboratory experiments other people had done. This is always wise, of course, because there had been giants before me on whose shoulders I hoped to stand! To ignore their work would have been foolish. Another hot bath was called for to think the problem through: another eureka! The problem boiled down to combining theoretical concepts applicable to fine sediments which travel largely in suspension, with those applicable to coarse sediments which travel largely along the bed, in essence seeking a transition between them that would cover intermediate sizes. It occurred to me that one might combine the two theories at the limits by putting them in such a form that one could multiply them together, one raised to the power n and the other to the power 1-n, with n being a function of some number expressing sediment size. This would be a relation between the gravitational effect and the effect of fluid viscosity on an individual particle. Whether it would work required the analysis of all published research data within this new framework. My clever man for this was Dr Rodney White, assisted by Charles Robson of the computing section, who consulted experts at Harwell on how to go about the analysis when there were a lot of variables. It worked and we obtained new transport functions that fitted all the data quite well, about two thirds of all the data points coming within a factor of two of the best fit equation. This was published (though not without difficulty in getting through the review process) in the Journal of ASCE, and got worldwide recognition as a good predictive method, the Ackers-White formula.. It stood the test of time well, but by degrees over the last thirty-five years since that work was done other research has led to equations that perform somewhat better…."



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Ackers was also responsible during his time in Wallingford for the introduction of computers as described in the following fascinating account of a long gone age:
"… During the period 1956 to 1972, there was great development in computing and in computational models. At first, HRS just had one or two mechanical calculators, the same Brunsviga that I had used at Bristol, and one or two spiral slide rules that could be read to four or five digits, and the staff's personal slide rules, for the calculations we were carrying out virtually every day. The first electronic calculator I saw was in about 1960 when an Australian academic, having passed through Singapore on his way to a conference in London, had picked up a Japanese calculator for about £35, I think, which would add, subtract, multiply and divide. The shape of things to come! Also big computers were being developed, the American firm IBM competing with the British firm ICL to get them on the market. In those days they were big beasts, requiring a special air-conditioned building, with large discs and huge magnetic tape spools to contain programs and data. If HRS was to stay at the forefront, it would have to move with the times and install one, especially as there was much development at universities of methods of solving complex functions describing processes varying in time, such as tides in estuaries. Those numerical models were referred to as one dimensional, although this was not very descriptive. All it meant was they could not represent two dimensions in plan, but they could properly represent the cross-section of flow and of course time is a dimension as well as length. The first mainframe computer – which is what those giants of that era were called – cost something of the order of £1,000,000 (ca. €1.5M), but development was so fast it wasn't long before it was getting outdated. Programs were produced on punched cards, perhaps hundreds of them, so woe betide anyone who dropped a full box! …Now, the PC on your desk at home does so much more, so much more effectively than was possible in 1972."

After sixteen years at HRS Ackers moved on to become the hydraulics consultant of well-known UK consulting firm, Binnie and Partners, in London in 1972. Binnie's management recognised the need to bring innovation and research to its engineering projects and Ackers was keen to move on. In the rest of this engaging book Ackers describes his interesting experiences working as a specialist on hydraulic engineering projects around the world.

Peter Ackers' autobiography covers a fascinating period when major hydraulic engineering projects were under construction throughout the world, and the consulting engineer was king! He describes a period of less complicated interaction between research and practice, when the PCs and software which we now take for granted simply didn't exist! Thanks go to Peter for sharing with us his experiences!

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Obituary

Professor Yvon Ouellet

Loss of a Canadian Specialist in Maritime Hydraulics (1939 - 2007)

Professor Yvon Ouellet, a long-time member of IAHR, was born in Rivière-du-Loup, Québec (Canada) on 31st March, 1939. Regrettably, he passed away on 8th December 2007 in Sainte Foy, Québec.

Dr. Ouellet, a student of Laval University in Québec, had an exemplary career in the same University as a faculty member from 1968 until his retirement in 2004. During this period, he held several key positions, such as Director of Research Centre for Water, Director of Research Centre for Numerical Applications in Engineering, and Director of Civil Engineering Department.

Dr. Ouellet was a respected Canadian specialist in Maritime Hydraulics for more than 35 years. Numerous students, who were trained by him during his career, benefitted a great deal from his special skill of focusing his research to solve practical engineering problems. Many of his students now occupy senior positions in both private and public sectors in Canada in the field of coastal engineering. He himself has contributed to many high profile projects in Québec, Canada, in the field of maritime hydraulics and promoted a multidisciplinary approach to solving problems. In 1988 he was awarded the Fellowship of the Canadian Society of Civil Engineering. More recently, he was awarded the title of Professor Emeritus in late 2006 by his University, in recognition of his numerous and exemplary contributions.

On a personal note, I will always remember Yvon for his friendship, simplicity, generosity and good humour. His death is indeed a big loss to the Canadian Engineering Community.

Dr. Etienne Mansard, FCAE
Honorary President of IAHR
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