

1995 RAY K. LINSLEY AWARD

Citation

Vit Klemes

I consider it a great honor to be chosen to present the Ray Linsley Award to my good friend, Vit Klemes. I don't remember when we first met, but it was long, long ago and far, far away, as the Trekkies say. And a Trekkie Vit is. His first acclaim was in his native Czechoslovakia, ending up working in the Hydrology and Hydraulics Institute of the Slovak Academy of Sciences in Bratislava. Bratislava is a beautiful city, known for its good wine, as Prague is for its good beer. However, Vit decided for some reason that he preferred Canada to Czechoslovakia, perhaps because of its balmy climate. Vit taught at the University of Toronto before joining Environment Canada, where he worked from 1972 until retirement in 1989.

Vit is perhaps best known for his work on water resource systems, particularly reservoir planning. His common sense thinking about problems always questions the conventional wisdom. It is that questioning attitude thorough which Vit has made many of his greatest contributions.

In the American Geophysical Union the Hydrology Section has threatened to distribute Tee Shirts emblazoned

"REPENT, DAVE DAWDY IS COMING"

We won't repent because Vit is coming, but there are many who have repented because they followed the common path of thinking, and Vit has shown them wrong. I have always prided myself on being the curmudgeon of hydrology, so it is with much regret that I must bestow on Vit the title of CHIEF CURMUDGEON OF HYDROLOGY as well as the Ray Linsley Award. I am a mere lieutenant in his army.

Vit earns this title well. Two papers will illustrate the reason. The first is his summary of the controversy concerning the Hurst Phenomenon. Back in the late sixties Benoit Mandelbrot and Jim Wallis published a series of papers on Fractional Gaussian Noise and explained how it could model long-term memory, such as exhibited by many long-term streamflow records. Money flowed like water from the National Science Foundation and other sources of largesse, and everyone jumped on the bandwagon and published papers on long-term memory. (Even I did). Then Vit finally summed up the hydrologic meaning of the Hurst phenomenon in his paper "The Hurst Phenomenon: A Puzzle?" published presciently in *Water Resources Research* in volume 10:4. And "Over and Out" it was.

Vit showed that the Hurst phenomenon did not necessarily result from "infinite

1995 RAY K. LINSLEY AWARD

memory", but could result from physical considerations, in particular basin storage. He also showed that it could result from non-stationarity. "In my opinion the analysis and modeling of hydrologic time series has often lost the hydrologic context during recent years" Vit said, a constant reminder to us to keep the physical system intact rather than the theory.

In a second paper, Vit started off with "Confusion seems to be the main asset that one acquires from the run-of-the-mill graduate education in hydrology. One embarks on it equipped, in most cases, with an undergraduate degree in engineering...and, after being taught (often by amateurs) rudiments of linear algebra, mathematical statistics, probability theory, systems theory and computer programming, is academically certified as an expert in hydrology---a geophysical science. The common result is a permanent or, at any rate, deeply planted inability to see the difference between technology, science and mathematics, and the mixing of them in ways ranging from amusing to dangerous." (Klemes, 1994).

Vit is often amusing but seldom dangerous, at least insofar as his hydrology is concerned. Because of his own thorough understanding of technology, science and mathematics, he has long been recognized internationally for his leadership. Vit has been President of the International Association of Hydrologic Sciences and has received its highest scientific award. Vit recently has been elected a Fellow of the American Geophysical Union.

All of these honors have been amply earned by Vit, and it gives me great pleasure to see the Ray Linsley Award added to his honors. Vit honors us with his presence as we honor him.

David R. Dawdy

Consultant, San Francisco, California

Klemes, Vit, The Hurst Phenomenon: A Puzzle?, Water Resources Research, Vol. 10, No. 4, pp. 675-688, 1974.

Klemes, Vit, Statistics and Probability: Wrong Remedies for a Confused Hydrologic Modeler, Statistics for the Environment 2: Water Related Issues, edited by Vic Barnett and K.F. Turkman, John Wiley & Sons, 1994.

1995 RAY K. LINSLEY AWARD

VIT KLEMES

3460 Fulton Rd., Victoria, British Columbia, Canada V9C 3N2

Acceptance Speech

On occasions like this, it is difficult to avoid cliches. There are only so many words to express thanks and all of them have been overused. This makes me feel almost embarrassed to thank you, David, for your kind words and to the AIH Award and Executive Committees for selecting me for this year's Ray K. Linsley Award. But I know of no better words, be it in English or in my native Czech, than 'thank you'.

I accept the award with pride and gratitude - at the same time remembering that it is presented to me at a conference on *Water Resources at Risk*. I hope I will be able to minimize the risk your kind gesture poses to my ego and, through it, to my work in water resources. For, to be sure, all awards should carry a warning '*This product can be dangerous to your health*', similar to those small-print one-liners aspiring to mitigate our various indulgences. I will do my best to abide by an advice I read on a bottle of an excellent Australian Cabernet Sauvignon I got last Christmas: '*Please enjoy in moderation*'.

I am proud of this award because of the symbolism which the name of Ray K. Linsley has, for me as well as for the uncounted numbers of hydrologists and engineers around the world, a symbolism which this award preserves and commemorates: It symbolizes a no-nonsense approach to practical hydrological problems, respect for hydrological data, recognition of the enormous complexities of hydrological interactions hiding behind the simple framework of the hydrologic cycle, a realistic assessment of our limited understanding of these interactions on the one hand and, on the other, the inescapable necessity often to provide 'solutions' to problems imposed by society, even in cases where the requisite scientific knowledge is inadequate, a judicious use of available techniques and tools and, above all, a sound and responsible professional judgement.

I have heard it being said that Ray Linsley had a detrimental influence on hydrology, that the two famous Linsley-Kohler-Paulhus books, *Applied Hydrology* and *Hydrology for Engineers*, have delayed progress in hydrology by thirty years. I have often pondered this no doubt serious charge, the more so because I myself have criticized the lack of progress in hydrology on numerous occasions and yet, it has never occurred to me to blame Ray Linsley for it. Was I missing something? What were his sins that I did not see? Why did *Applied Hydrology* impress me so much when I first got acquainted with it as a young water resource engineer in a faraway country? Why was *Hydrology for Engineers* the first professional book I bought when I came to

1995 RAY K. LINSLEY AWARD

Canada almost thirty years ago?

The answers are simple and there is no mystery involved. To use an analogy that does not unduly detract from this Banquet, I would say that blaming Ray Linsley for delaying progress in hydrology is similar as blaming a good chef for a slow improvement in the quality of meat and vegetables available on the market. His sin apparently consists in his knowledge how to make do with what he can get and still manage a decent menu: for something about getting a better stuff to the market.

It sounds logical, but it is this kind of logic that underlies every demagoguery: it reaches a formally correct conclusion on the basis of premises which, however, can be construed only *after the fact*, after the conclusion has been made. In our case, the chef could be legitimately blamed only if he were dishonest, if he used his art deliberately to conceal the imperfections of the ingredients he was using, if he were engaged in a coverup of some dirty practices on the part of the producers or suppliers.

Well, Ray Linsley was a great chef but also an honest chef. Not only that his use of the various tools in hydrological work was expert, but he never ceased emphasizing the need for a better hydrology and kept pointing out the holes in it that, in applications, had to be bridged by ad hoc assumptions and judgements. Thus, for instance, we read in the very first paragraph of the Preface to the *Hydrology for Engineers*:

"The basic processes of hydrology continue to be stressed, in the belief that an understanding of these processes is essential to the application of any of the tools of hydrology."

What I valued perhaps most in Ray Linsley was his professional honesty and absence of pretence - attributes with which the academic community is not exactly overflowing. And I venture to say that these attributes, abundantly reflected in his writings, won him esteem of those who new the difference between **doing hydrology** and **writing about it**, and condescension of those who did not.

Among the hydrologists of note, he would be the last I could imagine engaging, for example, in theoretical arguments about the asymptotic behavior of the kernel of the Muskingum model, but the first I could picture doing, with a slide rule, actual flood routing calculations and getting the result fast and about right. Yes, 'about right', because in hydrology - and I don't mean the black-board, dry-water hydrology of response function, linear moments and random number generators - that is all one can reasonably hope for and Ray Linsley understood that. What a delight (to me, anyway) to see, say, a sketch for hydrograph separation showing its three possible time bases labelled 'Too short', 'About right' and 'Too long' and reading that "there is no real basis for distinguishing between direct and groundwater flow in a stream at any instant" and that "the definitions of the two components are relatively arbitrary" (*Hydrology for Engineers*, pp. 230, 231, second edition). No barrage of spurious mathematics, no hiding of a conceptual weakness behind some artful optimization, no fancy additives to disguise a home brew as a Coonawarra Cabernet Sauvignone, just an honest and simple 'about right'.

This was typical for Ray Linsley and the abundance of similar instances in his writings gives the lie to the criticism I cited above. There was plenty of inspiration and hints on what

KLEMES

could and should be improved in hydrology that could be found in Ray Linsley by those whose concern about its progress was genuine and who were capable of contributing to it.

This brings me to the essence of professionalism which your Institute has chosen to promote, advance and protect in American hydrology and which is so aptly symbolized in the Ray K. Linsley Award. I see this essence in a realization that, the importance of research and new scientific discoveries notwithstanding, 95% of hydrology, its daily bread so to say, consists in a vast amount of unglamorous hard work with hydrological instruments, analysis of data and their interpretation. It is exactly because the bulk of the work is routine in nature and because its results are of a fundamental importance for so many applications, why it is essential that it be done *professionally*, that is with adherence to the highest standards of quality, with full recognition of its strengths and weaknesses and with the aim to improve its substance rather than appearances.

The ideal of professionalism, with its embodiment of quality, honesty and responsibility is noble and demanding - which is why its implementation requires constant attention and commitment by institutions like yours - but its roots reach deep into history. They are intimately linked with the very beginnings of civilization and I am inclined to think that one cannot survive without the other. I like to think, for example, that it was 'professionalism' rather than 'knowledge' what Confucius had in mind in his following pronouncement and would have used this term had it existed twenty five centuries ago:

"If you know something, hold that you know it - and if you do not, admit the fact: this is knowledge."

I wonder whether Ray Linsley was familiar with this maxim but I guess he would have liked it and judged it 'about right'.

The Ray K. Linsley award was established by the American Institute of Hydrology in 1986. It is named in honor of Ray K. Linsley, a great leader in the hydrological sciences. The award is presented for a major contribution in the field of surface-water or engineering hydrology.