

Interactive comment on “A history of the concept of time of concentration” by Keith J. Beven

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I am not quite sure how to respond to this - even to the comment that "the paper is dealing with a historical phenomenon, but does so without taking a typical historical angle of studying how the societal issues of the time were related to the work of hydrologists, how professional struggles may have influenced the outcome of scholarly debates, etcetera" when I have shown how the origins of the time of concentration concept lay in the applied need to predict peak flows; how this was then developed into distributed approaches (with confusion between velocities and celerities); then simplified to unit hydrographic approaches to meet the same need (with continued confusion even in the context of the GUH); and that even recent reviews of the concept remain confused. As far as I can tell there has not been much debate about whether velocities or celerities should be used, only continuing confusion in how time of concentration is defined (with the wrong use of velocity-based definitions right from the beginning). While time

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of concentration is a concept that underlies the estimation of peak discharges, the paper is definitely not about rainfall-runoff modelling. There are clearly other aspects to rainfall-runoff modelling that are not treated here - the whole paper is focused on time of concentration alone.

The editor does make an interesting comment about the use of approximate mathematics by hydrologists, but that is only partially relevant to the case about celerities and velocities being made here. These can be considered physical phenomena, with a long standing historical problem of comprehension by hydrologists, quite independent of the choice of mathematical assumptions used to describe them (again all the calculations in the appendix were only intended to provide illustrations of the differences that arise under different flow assumptions).

I can, of course, revise the paper to make these points more clearly. The comments also spurred me to try and find out more about the treatment in urban drainage in the late 19th Century to see if there was any use of celerities in defining concentration. This will take a little while longer to complete.

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